"Broadening Our View"

American Association for Agricultural Education

aaae

Annual Meeting of the American Association for Agricultural Education

May 24 – 27, 2010

Omaha, Nebraska

Monday, May 24th

1:00 – 5:00 pm	**Registration**	**Lobby**
3:00 – 4:30 pm	**AAAE Executive Board Meeting**	**Wyoming**
4:30 – 6:00 pm	**Journal of Agricultural Education** **Editing – Managing Board** Chair: Anna Ball	**Kansas**
6:45 – 7:45 pm	**Barrick Seminar** ***"College access to students of poverty, a point of meaning for teacher education"*** Chair: Susie Whittington Speaker: Dr. Ken Bird, CEO/President of Bright Futures Foundation	**Winnebago/Flanagan**
7:45 – 8:15 pm	**Refreshment Break for Barrick & Knapp Seminar Participants**	
8:15 – 9:15 pm	**Knapp Seminar** ***"Madagascar Conservation - Providing Solutions in Complex Cultural Environments"*** Chair: Mark Kistler Speaker: Dr. Edward Louis, Director of Conservation Genetics Omaha"s Henry Doorly Zoo Grewcock's Center for Conservation and Research	**Winnebago/Flanagan**

Tuesday, May 25th

7:00 am – 6:00 pm	**Registration**	**Mezzanine**

All attendees are welcome and encouraged to attend the StrengthsFinder workshop.
Busses will load at 7:15 and 7:30 am for the short trip.

8:00 am - noon	**Professional Development Workshop** ***"Engaging and Interacting through Strengths"*** Chair: Ben Swan, Professional Development Committee Presenter: Maika Bauerle, GALLUP	**GALLUP Riverfront Campus**
Noon – 1:45 pm	**Lunch on your own**	
Noon – 1:30 pm	**Ohio State University Alumni Luncheon**	**Capital/Dodge**

Tuesday, May 25th

1:45 – 3:30 pm	**Opening General Session** Presiding: Lloyd Bell **Welcome:** Greg Miller, Vice President North Central Region **Remembrance of Deceased Colleagues** Leno Christensen C. Cayce Scarborough Gerald Fuller Paul Marvin **Welcoming a new colleague** **Distinguished Lecture** Introduction by Susie Whittington **Nominating Committee Report** Gary Moore	**Winnebago/Flanagan**
3:30 - 4:00 pm	**Break**	**Mezzanine**
4:00 – 5:30 pm	**Concurrent Research Sessions (Pgs. 6 – 7)**	**Lewis, Clark, Missouri** **Iowa, Nebraska,Dakota**
5:45 – 6:30 pm	**Reception and Program for Graduate Student** Ben Swan, Professional Development Committee	**Kansas**
6:30 pm	**Dinner and Evening on Your Own**	
6:30 pm	**University of Missouri reception**	**Upstream Brewing Co.** **Omaha Old Market,** **514 S. 11th**
7:00 pm	**University of Florida Dinner**	**Sullivan's Steakhouse**

Wednesday, May 26th

7:00 – 9:00 am	**Registration (if needed)**	**Mezzanine**
7:00 – 9:00 am	**Department Head Meeting** Chair: Roger Tormoehlen	**Dakota**
7:30 - 9:00 am	**Innovative Poster Session (Pgs. 12 - 14)** Continental Breakfast	**Winnebago/Flanagan**
9:15 – 10:45 am	**Concurrent Research Sessions (Pgs. 8-9)**	**Lewis, Clark, Missouri** **Iowa, Nebraska,Dakota**
11:00 – 12:30 pm	**Committee Meetings**	

All AAAE members are encouraged to attend committee meetings. Each committee has 18 elected members that have "voting" privilege, but <u>all</u> attendees have "discussion" privilege.

Research Chair: David Doerfert	Lewis
Professional Development Chair: Ben Swan	Clark
Program Improvement Chair: Mike Spiess	Missouri
Member Relations Chair: Lynn Martindale	Iowa

12:30 pm	**Lunch on your own**	
12:30 – 2:00 pm	**Texas A&M/Texas Tech Luncheon**	**Old Chicago** **Old Market**

A tradition was launched last year for time to "kick back and smell the roses". There are many historical and cultural attractions within Omaha and the area: Lauritzen Gardens, Joslyn Art Galley, The Old Market Area, Arbor Day Farms @ Nebraska City to name only a few.

The optional professional development workshop to BoysTown USA was arranged at the request of the Teacher Education special interest group. On your visit to BoysTown, you'll see its history and national headquarters campus as well as learn about the integrated care approach followed with the citizens of BoysTown.

1:30 – 4:30 pm	**Professional Development Workshop (Optional)** Chair: Jon Ulmer, Teacher Education Special Interest Group BoysTown, USA	**BoysTown USA**

Busses will load on the Capitol Street side (north) of the DoubleTree Hotel at 1:30 pm

7:00 – 9:00 pm	**"Dinner under the Sharks"**	**Omaha's Henry Doorly Zoo Aquarium**

Busses will load on the Capitol Street side (north) of the DoubleTree Hotel at 6:15 pm

Thursday, May 27th

7:30 – 9:00 am	**Research Poster Presentation (Pgs. 15 -17)** Continental Breakfast	**Winnebago/Flanagan**
9:15 – 10:30 am	**Special Session** Presiding: Lloyd Bell Surfacing Critical Issues and Offering Ideas & Solutions Susie Whittington, The National Council for Agricultural Education The National Research Agenda David Doerfert, Chair AAAE Research Committee	**Ballroom West**
10:45 – 12:15 am	**Concurrent Research Sessions (Pgs. 10-11)**	**Lewis, Clark, Missouri Iowa, Nebraska**
12:15 – 1:30 pm	**Lunch on your Own**	
1:30 – 2:45 pm	**Special Interest Group Meetings**	

Ag Communications	Tracy Rutherford	Lewis
Ag Leadership	David Jones	Clark
Ag Literacy	Cary Trexler	Missouri
Teacher Professional Development	Matt Spindler	Kansas
Extension/Int’l Development	Robert Martin	Nebraska
Strengthening Academic Learning	Travis Park	Dakota
Teacher Education	Jon Ulmer	Iowa

2:45 – 3:15 pm	**Break**	**Mezzanine**
3:15 – 5:30 pm	**AAAE Business Meeting**	**Ballroom West**
6:30 – 8:30 pm	**Awards Banquet** Presiding: Susie Whittington	**Ballroom East & Center**
9:00 pm	**New Executive Committee** Chair: Susie Whittington	**Dakota**

Concurrent Research Session 1
Tuesday, May 25th
4:00 – 5:30 pm

Session 1A **<u>Career Choice in Agricultural Education</u>** **Lewis Room**

An Analysis of Post-Secondary Agricultural Education Students' Choice to Teach
Rebecca G. Lawver & Robert M. Torres

A Study of Pre-Service Agricultural Education Students: Knowledge of Horticulture and Self- Efficacy to Teach Horticulture
Eric Kennel, James Leising, & Craig Edwards

Identifying Barriers: Reasons Graduates Do Not Enter Agricultural Education
Benjamin G. Swan

Session 1B **<u>Considerations for Preservice Teachers' Development</u>** **Clark Room**

Purposes, Activities, and Documentation of Early Field Experience in Agricultural Teacher Education: A National Delphi Study
Scott Smalley & Michael Retallick

Pre-Service Teachers' Perceptions of Academic Integration within the Agricultural Science Classroom
Bart E. Gill & Kim Dooley

Determinants of Concern Levels of Multiculturalism among Secondary Preservice Teachers
Stacy K. Vincent, Justin L. Killingsworth & Robert M. Torres

Session 1C **<u>Developing Professionals in Extension Education</u>** **Missouri Room**

Competency Modeling in Extension Education: Integrating an Academic Extension Education Model with an Extension Human Resource Management Model
Scott D.Scheer, Graham Cochran, Amy Harder & Nick T. Place

An Assessment of the Inservice Training Needs of County Extension Directors in the Area of Program Needs Assessment
Martha Jackson-Banks & Jacquelyn P. Deeds

Evaluating the Influences on Extension Professionals' Engagement in Leadership Roles
Deborah L. Nistler, Alexa J. Lamm & Nicole Stedman

Concurrent Research Session 1
Tuesday, May 25th
4:00 – 5:30 pm

Session 1D **The Value of FFA & SAE** **Iowa Room**

Entry-Level Technical Skills that Agricultural Industry Experts Expect Students to Learn through Participation in the Supervised Agricultural Experience Component of Secondary Agricultural Education: A Delphi Study
Jon W. Ramsey & M. Craig Edwards

The Values and Expectations Alternatively Certified Agricultural Education Teachers Place on the Supervised Agricultural Experience Program: A Qualitative Study
J. Shane Robinson & J. Chris Haynes

Impact of FFA and Supervised Agricultural Experience on Student Retention and Academic Success
Mollie Aschenbrener & Brad Dodson

Session 1E **Integration of Academics in Agricultural Education** **Nebraska Rm**

Agriscience Teachers' Concern Profiles for Content Area Reading Strategies
Anna J. Warner & Brian E. Myers

Outcomes of Integrated Agriscience Processes: A Synthesis of Research
Elizabeth Wilson & Kevin W. Curry Jr.

An Analysis of National Agriscience Teacher Ambassadors' Stages of Concern Regarding Inquiry Based Instruction
Catherine W. Shoulders & Brian E. Myers

Session 1F **A Look at Organizations & Community** **Dakota Room**

Impacts of American Agricultural Education Student Teachers on Eleven Community Members in A New South Wales, Australia Community: A Qualitative Study
Tera Bunch & Carrie Stephens

Adding Value to Professional Conferences for Graduate Students
Shannon Arnold, JoLynn Miller & Carl Igo

Organizational Climate of the American Association For Agricultural Education
Billy R. McKim, Tracy A. Rutherford, Robert M. Torres & Tim H. Murphy

Concurrent Research Session 2
Wednesday, May 26th
9:15 – 10:45 am

Session 2A **<u>Teaching Self-Efficacy & Effectiveness</u>** **Lewis Room**

Adults' Level of Instructional Efficacy and Demographic Characteristics as Volunteer Educators in the University of Florida IFAS/Extension Master Gardener Program
Robert Strong & Amy Harder

The Relationship between Verbal Immediacy, Nonverbal Immediacy, Self-Efficacy and Task Value
Jonathan J. Velez & Jamie Cano

The Meaning of Effective Teaching through the Lens of Award Winning Faculty
Lucas D. Maxwell, Stacy K. Vincent & Anna L. Ball

Session 2B **<u>Experiences of Teachers</u>** **Clark Room**

Early Career Agriculture Teachers and Their Time
Misty D. Lambert, Anna L. Ball & John D. Tummons

Balancing Act: How Agricultural Teachers Meet Career and Family Responsibilities
Katie Murray, Jim Flowers, Barry Croom, Elizabeth Wilson & John Rayfield

Perceptions and Barriers of Four Female Agricultural Educators across Generations: A Qualitative Study
Linda Baxter & Carrie Stephens

Session 2C **<u>Job Satisfactions of Teachers</u>** **Missouri Room**

Keepers, Stayers, Leavers, and Lovers: Are there Teacher Efficacy and Job Satisfaction Differences between Novice and Experienced Teachers?
Rebekah B. Epps, Ryan M. Foor & Jamie Cano

Does the Ability to Manage Time Influence the Stress Level among Beginning Secondary Agriculture Teachers?
Robert M. Torres, Misty D. Lambert & John D. Tummons

The Role of Collaboration in Secondary Agriculture Teacher Career Satisfaction and Career Retention
Ann M. De Lay & Shannon G. Washburn

Concurrent Research Session 2
Wednesday, May 26th
9:15 – 10:45 am

Session 2D **Professional Development of Teachers** **Iowa Room**

A Comparison of the Inservice Needs of Traditionally and Alternatively Certified Beginning Teachers
Marshall Swafford & Curtis Friedel

Professional Development Needs of Missouri Agricultural Educators
P. Ryan Saucier, John D. Tummons, Robert Terry, Jr., & Leon G. Schumacher

Laboratory Management In-Service Needs of Wyoming Secondary Agriculture Teachers
Billy R. McKim, P. Ryan Saucier & Carl L. Reynolds

Session 2E **Communication and Technology** **Nebraska Rm**

Visual Communications: An Analysis of University Students' Perceptions of Rural America Based on Select Photographs
Dru Glaze, Leslie Edgar, Emily Rhoades & Tracy Rutherford

Understanding the Media Consumption Habits of College Students: A Comparison of Use Between Agricultural and Non-Agricultural Majors
Karen J. Cannon & Alexa J. Lamm

An Integrated Approach to Teach Communication Skills Using Educational Technologies
Shannon Arnold & Suzi Taylor

Session 2F **The Opportunities & Challenges of Distance Learning** **Dakota Room**

A Qualitative Analysis of the History of E-Extension (eXtension) and the Implementation of Moodle™ (A Learning Management System).
Tayla E. Hightower, Theresa Pesl Murphrey & Kim E. Dooley

An Analysis of the North Carolina Cooperative Extension Service's Role In Bridging the Digital Divide
Antoine J. Alston, Chastity Warren English, Lashawn Hilton, Chanda Elbert, & Dexter Wakefield

Student Perceptions of Distance Education in a Career and Technical Teacher Education Program
John Wilson, Brian Parr & Kemaly Parr

Concurrent Research Session 3
Thursday, May 27th
10:45 am – 12:15 pm

Session 3A   **Past, Present (&Future?) of Agricultural Education**   **Lewis Room**

Liberty Hyde Bailey: Agricultural Education Pioneer
James J. Connors

The History of Future Farmers around the World
James J. Connors

Making the Jump: The Meaning Minority Students Ascribe to College Major Choice
Stacy K. Vincent, Anna L. Ball & James C. Anderson II

Session 3B   **Meeting the Needs of College Students**   **Clark Room**

The Unknown Perspective: A Phenomenology of the Non-Retained Student
Justin L. Killingsworth, Lucas D. Maxwell & Anna L. Ball

Academic Advising in a College of Agriculture: Are Adjustments Needed in a Downturn Economy?
Carl G. Igo & Eric W. Larsen

Student Perceptions of Academic Advising Needs & Faculty Advisor Performance in a College of Agriculture
Amy R. Smith & Bryan L. Garton

Session 3C   **An Analysis of Cognition & Learning in Agricultural Education**   **Missouri Room**

Utilizing Natural Cognitive Tendencies to Enhance Agricultural Education Programs
Alexa Lamm, Emily Rhoades, Lori Snyder, Tracy Irani, T. Grady Roberts & Joel Brendemuhl

A Case Study Examining the Impact of Cognitive Load on Reflection and Pre-Service Teachers' Transfer of Specific Teaching Behaviors
Cory Epler, Jessica Waknine & Thomas W. Broyles

Impact of Gender, Ethnicity, Year in School, Social Economic Status, and State Standardized Assessment Scores on Student Content Knowledge Achievement When Using Vee Maps as a Formative Assessment Tool
Andrew C. Thoron & Brian E. Myers

Concurrent Research Session 3
Thursday, May 27th
10:45 am – 12:15 pm

Session 3D **<u>Informing Program Decisions through Needs Assessments</u>** **Iowa Room**

Feasibility of Using the Modified Matrix as a Method for Developing Workshop Content
Mark Russell, Todd Brashears, Jon Ulmer & Helen Barela

Student Farms at United States Colleges and Universities: Insights Gained from a Survey of Their Managers
Anna Leis, M. Susie Whittington, Mark Bennett & Matthew Kleinhenz

An Assessment of the Animal Science Technical Skills Secondary Agricultural Education Graduates Need for Employment in the Animal Science Industry: A Delphi Study
Wendy L. Slusher, J. Shane Robinson & M. Craig Edwards

Session 3E **<u>Leadership Development in Agricultural Education</u>** **Nebraska Rm**

Examining Secondary Agricultural Educators as Transformational Leaders at the Local Level: A Qualitative Case Study
John L. Hall, Gary E. Briers & Kim E. Dooley

Self-Perceived Leadership Development Factors of Former Arizona State FFA Officers
Bethany Masters, James Knight, Edward Franklin & Quint Molina

Are Champions Born or Made? Differences between Low Performers and High Performers in a Career Development Event
Erica B. Thieman, William Bird, Stacy K. Vincent & Robert Terry Jr.

Innovative Poster Session – Winnebago/Flanagan Room
Wednesday, May 26th
7:30 – 9:00 am

Agricultural Education "Un-Plugged": Using Wireless Slates (WS) during Student Teaching in Agricultural Education
Jon Ramsey

Blogging in the Classroom: Three Pedagogical Approaches to using Blogs for Reflection
Nicole Stedman, Greg Gifford, Karen Cannon

Bringing Experience Into the Classroom Through the Use of Blogs
Wendy Warner, Kathryn Murray, Ann De Lay

Build Me, See Me, Touch Me, Remember Me: Display Boards for Student Teachers
Ed Franklin

Developing a Diversified Program: The Madison County 4-H Youth Outreach Project
Billy F. Zanolini and Douglas D. LaVergne

Developing a Leadership Assessment Instrument for Cooperating Teachers
Gaea Wimmer, Todd Brashears, Scott Burris

Development of an Agricultural mechanics Course for Pre-service Teachers
Michael Pate, Greg Miller, W. Wade Miller

Enhancing Career Development Event Preparation Utilizing Jing Audio/Video Recordings
Kimberley Miller and Dr. Theresa Pesl Murphrey

Enhancing Pre-service Teaching Advising by Adopting a Skills Inventory
Mike Spiess and Mollie Aschenbrener

Facebook in the Virtual Classroom
Sarah Baughman and Jenna Genson

Food for Thought Curriculum: An Innovative, Collaborative Agricultural Literacy Project
Emily Holden, Peg Herring, Shawn M. Anderson, Jonathan J. Velez, Gregory Thompson

Getting Their Feet Wet: Children's Water Festival Presentations as a Field Experience Component
Kellie Claflin and Tim Buttles

How Pre-service Teachers are Preparing to Serve the Deaf in AGED: Opting for American Sign Language (ASL) as a “Foreign Language” to Meet Teacher Certification Requirements in [state]
Dayla Turner, J.C. Bunch, M. Craig Edwards, Jon W. Ramsey

Innovative Poster Session – Winnebago/Flanagan Room
Wednesday, May 26th
7:30 – 9:00 am

Implementing the Integration of STEM Curriculum in Agricultural Education: Implications for Pre-service Teacher Education

J. Chris Haynes, Jeffrey H. Whisenhunt, J.C. Bunch, M. Craig Edwards, J. Shane Robinson

Improving Facility Evaluation Skills

Benjamin G. Swan and Kattlyn J. Wolf

Incorporating College Success Tactics into a Dual Credit Course Curriculum: Coaching Students On How to Enter College Efficiently and Effectively from the First Day

Alanna Neely, Cliff Ricketts, Warren Gill

Innovations in Agri-Life Sciences: A Journal for Secondary Academic Excellence

Bryan Hains and Matthew Anderson

Integrating Teaching with Technology `

Katie Undem and Dr. Shannon Arnold

Jamaica: Dawn of a New Beginning

B. Allen Talbert, Mark A. Balschweid, Daniel Gottschalk

Making Learning Meaningful for the Millennials: Podcasting with a Purpose in Agricultural Education

JC Bunch, J. Chris Haynes, Jon W. Ramsey, M. Craig Edwards, Tanner Robertson

Mentoring "quick-starter" graduate students

Karen Cannon

Produce Your Own: A Community Gardening Program

JoLynn Miller and Dr. Shannon Arnold

Professional Development through Winter Technical Institutes: Agricultural Electrification

P. Ryan Saucier and John D. Tummons

Recruiting by Doing: Utilizing existing undergraduate student organizations to facilitate secondary student recruitment in agricultural teacher education

Ayla R. Detwiler, Daniel D. Foster, John C. Ewing

Recruiting Future Agricultural education Students into the Teaching Profession: The Development of an AGED CDE

Mandy Jo Campbell and Shane Robinson

Social Media and Small Businesses - Creating Marketing Strategies in the Digital Age

Leslie D. Edgar, Jefferson Miller, Stacey W. McCullough, Kimberly B. Magee

Innovative Poster Session – Winnebago/Flanagan Room
Wednesday, May 26th
7:30 – 9:00 am

SPARK: Lighting up student learning in knowledge translation and transfer
Owen Roberts

Student Teaching Capstone Expedition
Benjamin G. Swan, James J. Connors, Kattlyn J. Wolf

The Leadership Spot: A multi-institutional, online approach to leadership education
Heath E. Harding, Andrea Lauren Andrews, Dr. Gregory T. Gifford, Dr. Gina S. Matkin

Training the Teachers: An Agricultural Communications Career Development Event Training Workshop
Ashley Palmer, Erica Irlbeck, and Courtney Meyers

Transforming Education in Agriculture for a Changing World
R. Kirby Barrick

Transforming leaders through international experiential learning: A synergistic collaboration between nonprofit organizations and academia
Jill Casten & Marty Tatman

Using concept maps to better understand the discipline of agricultural education
Michael Retallick

Using Interactive Whiteboards in the Agricultural Education Classroom: How Student Teachers are Using this Technology - Potential Implications for Teacher Educators
JC Bunch, Jeffrey H. Whisenhunt, M. Craig Edwards, J. Shane Robinson, Jon W. Ramsey

Utilizing Virtual Field Trips in Preservice Teacher Education
Catherine W. Shoulders; Brian E. Myers

Virtual Student Teacher Meeting: Implementing Face-to-Face Reflection at a Distance
Thomas Paulsen

Research Poster Session – Winnebago/Flanagan Room
Thursday, May 27th
7:30 – 9:00 am

A Model for Improving Faculty Instruction in Colleges of Agricultural & Environmental Sciences
Diana King

A Perceptual Analysis of State Supervisors' Views Towards Inclusion In Secondary Agricultural Education Programs
Chastity Warren English, Antoine J. Alston, Anthony Graham, Dexter Wakefield, Frankie Farbotko

An Analysis of Florida Career and Technical Education Teachers' Stages of Concern Regarding the Use of Content Area Reading Strategies
Adrienne Gentry, Catherine W. Shoulders, Brian E Myers

An Exploratory Study of Students' Oral Presentation Self- Efficacy
Levon Esters

An Investigation of the Impact of Student Teaching on Attitudes Toward Teaching Secondary Agriculture
Rebecca G. Lawver, Amy R. Smith, Robert M. Torres

BEEF, Its' What Makes Leaders: Leadership Skills Developed through the Georgia Junior Beef Show Program
Chris Morgan

Components of Teacher Identity as Indicated by Clinical Faculty
Katherine McKee

Culturally Competent Secondary Agriculture Teachers: The Multicultural Awareness-Knowledge-Skill-Attitude Assessment
Stacy Vincent

Describing The Cognitive Level Of Discourse Of A Secondary Teacher During An Animal Science Unit Of Instruction
Jeremy Falk, Ashley Batts, Dr. Susie Whittington

Desired Characteristics of Beginning Agricultural Education Instructors as Perceived by School Administrators
Ayla R. Detwiler, John C. Ewing, & Daniel D. Foster

Development of an Instrument to Measure the Agriscience Education Self-Efficacy of Middle School Students
Levon Esters

Research Poster Session – Winnebago/Flanagan Room
Thursday, May 27th
7:30 – 9:00 am

Effectiveness of Integrating Video Clips into the Secondary Agricultural Education Curriculum
Gaea Wimmer and Dr. Courtney Meyers

Exploring the Indicators of an Effective Agricultural Educators' Professional Development Event: The DELTA Conference
Nina Crutchfield

FFA Professional Development Needs of Missouri Agricultural Educators
P.Ryan Saucier, John Tummons, Leon G. Schmacher, Robert Terry, Jr.

How are Students Thinking Critically? Measuring the Difference between Seeking Information and Engagement
Alexa J. Lamm, Rochelle Strickland, Dr. Tracy Irani

Identifying Graduate Students' Areas of Concern
Courtney Meyers and Gaea Wimmer

Improving Undergraduate Curriculum: What do our Alumni Think?
Kori Barr, Erica Irlbeck, Cindy Akers, Courtney Meyers, David Doerfert, & Alyx Shultz

Leadership and Decision-making Life Skill Development in 4-H Shooting Sports Participants
Shanna M. Holder, Dr. John L. Long, Dr. Michael E. Newman, Dr. Susan L. Holder

Northwest's Supply & Demand for 2009-2010: Who is filling the Ag Teaching Positions?
Ben Swan

Perceptions of Pre-service Agricultural Education Students Enrolled in a Model
Elizabeth Wilson, Kevin Curry

Perceptions of Instructional Methods in Biofuel Education of Secondary Students
Clayton Sallee, Don Edgar, Donald Johnson

Perspectives on the Future of Rural Education in [State]
Caleb Harms and Dann Husmann

Professional Educators' Understanding of Agricultural Awareness and Literacy in a Mid-Western State
Vikram Koundinya, Robert Martin, and Ashley Batts

Student Interest Survey in an Interdisciplinary Undergraduate Minor in Leadership Studies
Robert Birkenholz

Students' New Media Use as a Basis for Advancing Agricultural Communications Curricula
Bryan K. Ray, Traci L. Naile, K. Jill Rucker

Research Poster Session – Winnebago/Flanagan Room
Thursday, May 27th
7:30 – 9:00 am

Students' Self-Perceived Critical Thinking Skills in an Agricultural Ethics Course
Courtney Quinn, Heath Harding, Gina Matkin, Mark Burbach

Students' Perceived Value of the Contribution of Instructional Methods Towards Understanding Risk & Crisis Communication
Mrs. Christy Witt, Dr. David Doerfert, Dr. Tracy Rutherford, Dr. Theresa Murphrey, Dr. Leslie Edgar

The Educational Processes: Relative Importance to Extension Educators
Nav R. Ghimire and Robert A. Martin

The Relationships between Instructional Efficacy and Motivational Orientations for [State] Master Gardeners
Dr. Robert Strong and Dr. Amy Harder

The Role of Animation Towards Cognitive Achievement
Ron Koch and Don Edgar

Tips from the Trenches: Teaching Advice for Beginning Academics
Kelsey Hall and Courtney Meyers

To Teach Or Not To Teach: What Factors Impact Preservice Students' Decision to Teach?
Dr. Steven J. Rocca and Dr. Wendy Warner

Using Mathematics Enrichment Activities in Preparation for the Agricultural Mechanics CDE
Kirk Edney and Tim H Murphy

Concurrent Research Session 2
Wednesday, May 26th, 9:15 a.m. - 10:45 a.m.

2E-Communication and Technology....................................Nebraska
Discussant: Robert Martin, Iowa State University
Facilitator: Kelsey Hall, Texas Tech University

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Discussant: Colleen Brady, Purdue University
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Discussant: Daniel Foster, Pennsylvania State University
Facilitator: Bart Gill, Texas A&M University

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Making the Jump: The Meaning Minority Students Ascribe to College Major Choice
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3B-Meeting the Needs of College Students................................Clark
Discussant: Jamie Cano, Ohio State University
Facilitator: Marshall Swafford, Louisiana State University

The Unknown Perspective: A Phenomenology of the Non-Retained Student
Justin L. Killingsworth, Lucas D. Maxwell & Anna L. Ball

College of Agriculture Academic Advising in a Downturn Economy: Are Adjustments Needed?
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Discussant: Scott Burris, Texas Tech University
Facilitator: Kesha Henry, Purdue University

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Facilitator: Nav Ghimire, Iowa State University

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3E-Leadership Development in Agricultural Education.........Nebraska
Discussant: Tracy Hoover, Pennsylvania State. University
Facilitator: Marlene Eick, Ohio State University

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OMAHA™

American Association for Agricultural Education

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Discussant: Debby Boone, West Virginia University
Facilitator: Abby Robinson, Purdue University

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An Assessment of the Inservice Training Needs of County Extension Directors in the Area of Program Needs Assessment
Martha Jackson-Banks & Jacquelyn P. Deeds

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Proceedings of the 2010 American Association for Agricultural Educators Research Conference

Volume 37
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Omaha, Nebraska

Edited by:
Neil A. Knobloch
Purdue University

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Summary of the 2010 AAAE Research Conference Review and Program
Neil A. Knobloch, Purdue University

It is my pleasure to present the *Proceedings of the 37th Annual American Association for Agricultural Education Research Conference.* The proceedings are a result of 51 paper presentations that were shared at the AAAE Conference on May 24-27, 2010 in Omaha, Nebraska. Each year, the research conference builds on the work and traditions established by previous conference chairs (see list). The 2010 conference was no different, but this was the first year a formalized set of policy guidelines were followed. The AAAE Protocol Guidelines for Conference Paper Selection, Presentations and Awards were established by an *ad hoc* committee and was approved at the 2009 AAAE Conference. The purpose of the protocol guidelines was "to systematize the paper selection process," and according to one of the committee members, "provide a policy document that would help research conference chair to provide a review process that would be rigorous, consistent, and limit the amount of redundancy." Moreover, the convergence of a recently adopted online system with the inaugural year of implementing the protocol guidelines was a new frontier for the research conference.

The submission and review process of research papers was conducted using FastTrack. There were 119 papers submitted by the January 19th deadline. Manuscripts were peer-reviewed using a "blind review" process. The review process occurred in 42 days. In all, there were 119 reviewers representing 36 universities. Each manuscript was assigned to 3 reviewers, additional reviewers were assigned as needed, and the review process occurred over 48 days. All papers were ranked based on the overall recommendation from reviewers (Item 56 on the review form). In sum, 51 of the 119 manuscripts were accepted for presentation for an acceptance rate of 43%.

I would like to express my appreciation to Robbie Ortega and Amy Jones, who assisted me in organizing the review process, proceedings, program, and awards. Moreover, I want to thank my colleagues in the Department of Youth Development and Agricultural Education at Purdue University who served on the "2010 AAAE Research Conference Planning Committee" and assisted in the role as an "editorial review board" with the interpretation of the protocol guidelines and review process. Thank you, team—Colleen Brady, Natalie Carroll, Levon Esters, Steve McKinley, Kathryn Orvis, Jerry Peters, Mary Pilat, Allen Talbert, Roger Tormoehlen, and Mark Tucker.

Many hours have been invested in the conference and I want to thank the authors for submitting and revising the manuscripts in a timely manner. I would also like to thank the reviewers (see list) for their countless hours of reviewing manuscripts. Moreover, special thanks to the discussants, facilitators, and outstanding paper judges for their help with the conference sessions. I would also like to express my gratitude to Lloyd Bell for providing leadership in planning the conference, and to George Chronis and David Doerfert for their assistance in navigating FastTrack and the review process.

Regards,

Neil Knobloch
2010 AAAE Research Conference Chair

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27	2000	Greg Miller	Iowa State University	San Diego, CA
28	2001	Joe W. Kotrilik Michael F. Burnett	Louisiana State University	New Orleans, LA
29	2002	Michael K. Swan Marty Frick	Washington State University Montana State University	Las Vegas, NV
30	2003	Jamie Cano Larry E. Miller	The Ohio State University	Orlando, FL

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32	2005	Eddie A. Moore David Krueger	Michigan State University	San Antonio, TX
33	2006	Kirk Swortzel Jacquelyn Deeds	Mississippi State University	Charlotte, NC
34	2007	Gary E. Briers T. Grady Roberts	Texas A&M University	Minneapolis, MN
35	2008	Edward A. Franklin	University of Arizona	Reno, NV
36	2009	Todd Brashears Seve Fraze	Texas Tech University	Louisville, KY
37	2010	Neil A. Knobloch	Purdue University	Omaha NE

An Analysis of Post-Secondary Agricultural Education Students' Choice to Teach

Rebecca G. Lawver, Utah State University
Robert M. Torres, University of Missouri

Abstract

The purpose of this study was to identify and describe the factors that influence senior-level agricultural education students' choice to become secondary agricultural education teachers. The study focused on the extent to which students' beliefs and attitude about teaching influenced their intent to select teaching secondary agricultural education as a career. An adaptation of the FIT-Choice® Scale instrument was distributed to senior-level students enrolled at post-secondary institutions with teacher development programs to certify secondary agriculture teachers within a nine state area. One-hundred forty-five students completed the instrument. Overall, negligible to low relationships were found between students' beliefs about teaching and selected characteristics. Negligible to low relationships were found between students' attitude toward teaching and the selected characteristics. A moderate relationship was found between students' participation in high school agricultural education courses and their intent to teach. Additionally, negligible to low relationships were found with the remaining student characteristics and their intent to teach.

Introduction

The strength of the agricultural education profession hinges on several variables including state and federal legislation, funding, public perception, local administration, and on the recruitment of graduates into the agricultural education profession (Kantrovich, 2007). In the current National study of the supply and demand for Agricultural Education, it was reported that almost one-half of new agricultural education graduates who were certified to teach, chose careers other than teaching (Kantrovich). Agricultural education continually faces a legitimate shortage of qualified teachers to fill vacant positions in public schools (Camp, Broyles, & Skelton, 2002). This is problematic as unfilled positions either are left unfilled, programs are closed entirely, or administrators are forced to hire uncertified or alternatively certified teachers (Roberts & Dyer, 2004). Additionally, demands for highly qualified agriculture teachers are a concern as well. The National Council for Agricultural Education (The Council, 2002) established an initiative entitled *Reinventing Agricultural Education for the Year 2020,* with a critical goal of "providing an abundance of highly motivated, well educated teachers in all disciplines, pre-kindergarten through adult, providing agriculture, food, fiber and natural resource education" (The Council, p. 4).

A number of studies have been conducted to determine undergraduate choice to major in agricultural education. Park and Rudd (2005) stated that secondary agriculture teachers influence many decisions about a student's career and further education through their actions, comments, and instruction. The interactions between teacher and student influence students' choice of career that may lead to a career in teaching agricultural education. When agriculture teachers employ encouraging attitudes and behaviors, they may help recruit new teachers into the profession (Park & Rudd). Stiegelbauer (1992) identified the importance of being a role model for adolescents, continual learning and growth, sharing personal knowledge and expertise, and creating a positive learning environment as motivation to choose a career in teaching. In a study conducted much earlier, Cole (1984) concluded that students who were actively involved in SAE and FFA activities were more encouraged to choose agricultural education as a college major. Additional reasons for majoring in agricultural education, as identified by Hillison, Camp and Burke (1986), were the flexibility of the program that allows majors to enter jobs other than teaching. Moreover, Esters and Bowen (2005) suggested that parents and friends were most influential on students' career choice.

Recruiting students to the profession is important to maintain and grow secondary agricultural education programs across the country. Insight into the factors that influence students' choice to teach will offer additional assistance and guidance when developing recruitment efforts. The question remains: Why do students' choose a career in teaching? Students enter the teaching profession expecting to make a difference in the lives of students (Hayes, 1990; Stiegelabauer, 1992). Brunetti (2001) found that the most important motivation for experienced teachers' choice to teach was the opportunity to work with young people and watching their students learn and grow. Harms & Knobloch (2005) identified several factors to explain career choice for students in agricultural education and career and technical education, in general. The factors included, serving others, touching people's lives/making an impact, the "calling' to the career, salary and benefits, balance between career and personal time, and opportunities for advancement.

Theoretical Framework

Fishbein and Ajzen (1975) provide the framework for which to better understand antecedents to behaviors. According to Fishbein and Ajzen, in general, an individual will hold a positive attitude toward a given behavior if he/she believes that the performance of the behavior will lead to mostly positive outcomes. Fishbein and Ajzen suggest that many researchers fail to distinguish between beliefs, attitudes and intentions and stated that behavior is a result of intentions. Intentions, then, are a function of one's attitude which are a result of one's beliefs or expectations that the behavior will lead to a particular outcome. Additionally, the Expectancy-Value theory is directly linked to Fishbein and Ajzen's theory with the core belief that behavior is a function of the expectancies an individual has and the value of the goal toward which the individual is working (Watt & Richardson, 2007). In general, Expectancy-value theorists have concluded that individuals' motivation for decision making can be influenced by their belief about how well they will do on an activity, and the extent to which they value the activity (Eccles, Adler, Futterman, Goff, Kaczala, Meece, & Midgley,1983; Watt & Richardson, 2007; Wigfield & Eccles, 2000). The Expectancy-Value theory is the overarching theory in which this study is based. Understanding students' motivations for choosing a teaching as a career has implications for teacher education, curriculum design, and recruitment.

The FIT-Choice framework provides a comprehensive model to guide systematic investigation into the question of why people choose teaching (Richardson & Watt, 2006). Richardson and Watt developed a FIT-Choice® framework model which organizes the themes from the teacher education literature and locate them within the Expectancy-Value framework to explain students' choices to teach. The FIT-Choice® model (see Figure 1) contains antecedent socialization influences, followed by more proximal influences of task perceptions, self perceptions, values, and fallback career. The task constructs include; expert career, high demand, social status, teacher morale and salary. Similarly, values constructs contain first order component constructs. The values constructs in the model include; intrinsic career value, job security, time for family, job transferability, shape future of children/adolescents, enhance social equity, make social contribution, bludging, and work with children/adolescents. The constructs ultimately lead to the choice to become a secondary agriculture teacher. The term bludging is an Australian expression meaning the laziest approach possible and was use as a construct identifier, not used in the instrument as to avoid misunderstandings. The FIT-Choice® scale determines the strength of influence for a range of attitude, motivation and intent from individuals choosing teaching as a career, this framework, founded on the Expectancy-Value theory, provides a comprehensive model to guide systematic investigation into the question of why people choose teaching as a career (Richardson & Watt).

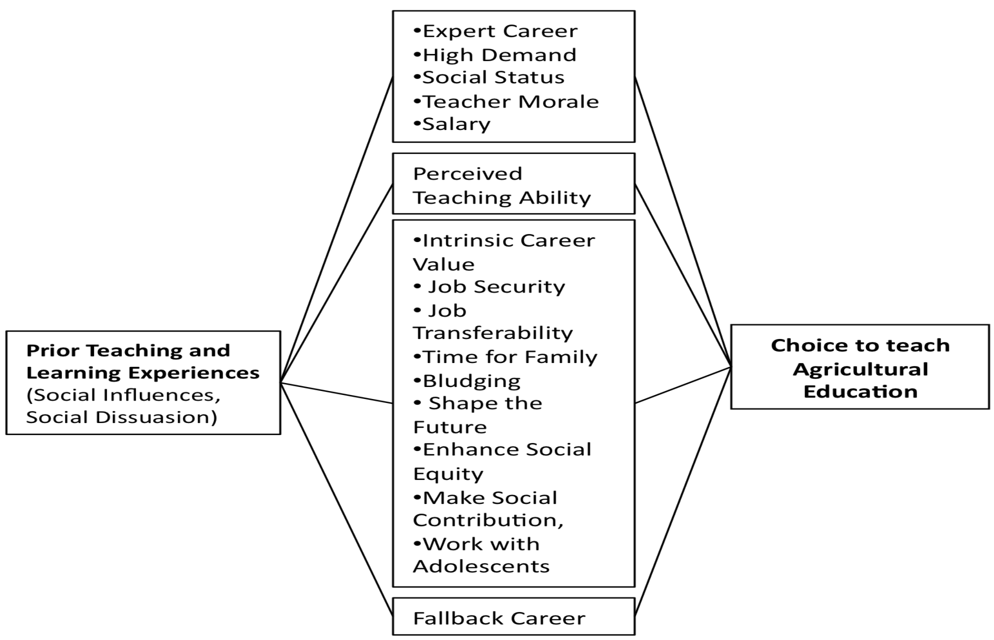

Figure 1. Ag Ed FIT-Choice Model, adapted from Richardson and Watt (2006).

Purpose and Research Objectives

Without a doubt, quality teachers are needed to fill positions at a time where teacher shortages are apparent and teacher education program recruiters stand to gain from this study. Thus, the purpose of this study was to determine the factors that influence agricultural education students' choice to become secondary agriculture teachers. The following research objectives were developed to guide the study:

1. Describe characteristics of students majoring in agricultural education (sex, perceived agriculture experience compared to their peers, years enrolled in school-based agricultural education courses, years of FFA membership, participation in SAE, and years of 4-H membership).

2. Describe students' beliefs about teaching secondary agricultural education (expert career, high demand, social status, teacher morale, salary).
3. Describe students' attitude toward teaching secondary agricultural education (ability, intrinsic career value, fallback career, job security, bludging, time for family, job transferability, shape the future of adolescents, enhance social equity, make social contribution, work with adolescents, prior teaching and learning experiences, social influences).
4. Describe students' intent to teach secondary agricultural education (social dissuasion, satisfaction with choice).
5. Determine the relationship between students' beliefs about and attitude about teaching secondary agricultural education, their intent to teach secondary agricultural education and their sex, perceived agriculture experience compared to their peers, years enrolled in school-based agricultural education courses, years of FFA membership, participation in SAE, and years of 4-H membership.

Methods/Procedures

This study utilized a nonexperimental descriptive-correlational research design method to meet the purpose and research objectives of the study. This type of research often uses questionnaires to gather information from groups of subjects (Ary, Jacobs, & Razavieh, 2002). The target population was senior-level agricultural education students enrolled in a teacher preparation program. Institutions with teacher preparation programs in Agricultural Education were selected from states contiguous to Missouri by reason of proximity, ease of contact, cost, and familiarity with the teacher education programs within each state. Twenty-six teacher education programs within Arkansas, Illinois, Iowa, Kansas, Kentucky, Missouri, Nebraska, Oklahoma, and Tennessee were initially identified from the American Association for Agricultural Education Directory (2007). Of the 26 teacher education programs within the nine-state area, 19 programs were included in the study. The 19 teacher education programs were selected based upon a single criterion established *a priori*. The selection criterion was access to senior-level level agricultural education majors who were to participate in student teaching during the fall of 2008 or spring of 2009. Students tend to be defined cohort groups, arguably, cohorts for subsequent years are likely to represent similar dispositions. Oliver and Hinkle (1982) argued that defined student cohorts could be considered representative of future similarly defined cohorts. Consequently, this study is viewed as a time and place sample.

The data collection instrument was adapted from the FIT-Choice® Scale (Watt & Richardson, 2007). The FIT-Choice® Scale was developed to measure beliefs, attitude and intention of teacher candidates (Richardson & Watt, 2006). Dr. Helen Watt provided written permission allowing the FIT-Choice® to be utilized and adapted for this study. Section one of the instrument included 40 statements designed to collect data related to students' attitude toward becoming a secondary agricultural education teacher. These questions began with the stem "I want to become a high school agriculture teacher because," and included questions such as "I like teaching about agriculture," "it will allow me to shape children's values," and "I have had good teachers as role models." The questions are grouped into 13 sub-constructs to measure attitude included "make a social contribution," "prior teaching and learning," ability," "work with adolescents," "intrinsic career value," "job security," "enhance social equity," "shape the future," "social influence," "job transferability," "time for family," "fallback career," and "bludging." Section two of the instrument was designed to collect data related to students' beliefs about teaching. These 15 items began with the stem, "Compared with other professionals," and included questions such as "teaching agriculture is a highly skilled occupation" and "agriculture teachers are perceived as professionals." The questions are grouped into five sub-constructs that measured beliefs included "expert career," "social status," "teacher morale," "salary," and "high demand."Section three included six statements related to students' intent to teach and are measured by two sub-constructs, "satisfaction with choice" and "social dissuasion". For each item, students were asked to identify their level of agreement. The response scale was a five-point Likert scale with the following choices: 1 = definitely disagree, 2 = disagree, 3 = neutral, 4 – agree, 5 = definitely agree.

A panel of experts was utilized to review the instrument and address face, construct and content validity. The panel consisted of seven university faculty members representing higher education intuitions from across the United States and Australia. A pilot study was conducted in September of 2008 with freshman level agricultural education students (n = 29) at University of Missouri. This group of students was selected because of their similarity in teaching interests to that of the target population. As a result of the pilot test, modifications were made to the final instrument including clarification of questions and minor formatting changes. The pilot test served to estimate the reliability for each sub-construct where "shape the future of adolescents" was .90, "job security, work with adolescents and social influence" was .86, "salary" was .84, "ability" and "enhance social equity" were .78, "prior teaching and learning" was .77, "intrinsic career value" was .76, "time for family" and "expert career" were .75, "make social contribution" and "satisfaction with choice" were .67, "high demand" was .65, "social status" and "social dissuasion" were .63, "fallback career" was .60 and "job transferability" was .52.

Due to the nature of convenience sampling, non-response error was not a concern in this study. However, to encourage participation of the cohort groups multiple contacts were utilized. Data were collected using five points of contact. Agricultural education faculty members at the 19 institutions were contacted via email in early September of 2008 and asked to assist in the data collection process. Faculty members were asked to identify one primary faculty contact and the number of senior-level agricultural education students who would be able to participate. Once consent was obtained from the faculty members and students were identified, instructions for the study were sent via email to the institutions who agreed to participate as a pre-notice letter which explained the purpose of the study, the process of completing the instrument, the responsibility of the faculty member, specified timeline and, IRB information. The second contact with the selected faculty members included the packet of questionnaires, instructions and self addressed, stamped return envelope. The responsibility of the primary faculty contact was to distribute, collect, and return the questionnaires to the researcher. For the faculty contacts who had not returned the completed questionnaires, an email was sent to the two weeks later that contained information similar to the third contact and served as either a thank you or reminder. The fourth contact was made with faculty contact for which data was missing via email to determine whether or not they needed additional time or new copies of questionnaires. A packet was mailed to the primary faculty contact that had either not yet begun the instrument or individuals who requested additional copies. The final contact was made via email February 2, 2009. Results include a response rate of 93% as 18 of the 19 institutions that initially agreed to participate returned questionnaires for a total of 145 respondents (n = 145). To interpret the magnitude of the correlation coefficients, the Davis (1971) conventions were used. Data were analyzed using SPSS® 15.0 for Windows. An alpha level of .05 was set a priori.

Results

Research objective one sought to analyze the student selected characteristics (sex, perceived agriculture experience compared to their peers, years enrolled in school-based agricultural education courses, years of FFA membership, participation in SAE, and years of 4-H membership) (see Table 1). The majority of respondents were female 77 (53.47%). In regards to perceived agriculture related experience (as compared to their peers) 67 (47.53%) respondents identified themselves as having more agriculture experience, 57 (39.58%) respondents identified themselves as having the same amount of agriculture experience and 20 (13.89%) respondents identified themselves as having less agriculture experience than their peers. The majority of respondents 125 (86.21%) took one or more school-based agriculture courses and reported a mean of 4.05 (SD = .88) years of enrollment in secondary agricultural education. The majority of respondents 127(87.59%) reported having been a member of the National FFA Organization, the mean number of years of membership in the FFA was 5.52 (SD = 1.91) years. Nearly four-fifths of respondents (78.32%) reported having a Supervised Agricultural Experience (SAE) project. The majority of the respondents 103 (71.74%) were also members of 4-H and reported a mean of 7.27 (SD = 3.71) years of membership.

Table 1
Characteristics of Senior-level Level Agricultural Education Students (n = 145)

Characteristic	*f*	%	*M*	*SD*
Sex				
Female	77	53.47		
Male	67	46.53		
Agriculture Experience[a]				
More than Others	67	46.53		
Same as Others	57	39.58		
Less than Others	20	13.89		
Enrolled in School-Based Agricultural Education				
Yes	125	86.21		
No	19	13.10		
Years of Enrollment			4.05	.88
FFA Membership				
Yes	127	87.59		
No	17	11.72		
Years of FFA Membership			5.52	1.91
Supervised Agricultural Experience Project				
Yes	112	78.32		
No	31	21.68		
4-H Membership				
Yes	103	71.53		
No	41	28.47		
Years of 4-H Membership			7.27	3.71

[a]Perceived agriculture experience compared to their peers
Note. Frequency totals represent missing data; valid percents are reported

Research objective two sought to analyze the beliefs of senior-level agricultural education students about teaching. Students were asked to indicate their level of agreement regarding statements of beliefs about teaching secondary agricultural education (see Table 2). Five sub-constructs were identified from the beliefs about teaching construct. The following sub-constructs represented the agree category (3.60 – 4.50): "expert career", having the highest mean
(*M* = 3.98; *SD* = .69), followed by "social status" (*M* = 3.79; *SD* = .62), and "teacher morale" (*M* = 3.67; *SD* = .67). The sub-construct "salary" (*M* = 2.94; *SD* = .97) represented the not sure (2.60 – 3.50) category and "high demand" (*M* = 2.54; *SD* = .56) represented the disagree category (1.60 – 2.50).

Table 2
Sub-constructs of Beliefs about Teaching (n = 145)

Construct Item	*M*	*SD*
Expert Career	3.98	.69
Social Status	3.79	.65
Teacher Morale	3.67	.67
Salary	2.94	.97
High Demand	2.54	.56

Note: 1 = definitely disagree, 2 = disagree, 3 = neutral, 4 – agree, 5 = definitely agree

Research objective three sought to determine the attitude about teaching agriculture education held by senior-level agricultural education students. Students were asked to indicate their level of agreement to each statement regarding attitude about teaching secondary agricultural education (see Table 3). Thirteen sub-constructs were identified for which none of the sub-constructs represented the definitely agree category (4.60 – 5.00). Ten sub-constructs represented the agree category (3.60 – 4.50). The sub-constructs, arranged from highest mean to lowest mean included, "make a social contribution" (M = 4.38; SD = .46); "prior teaching and learning" (M = 4.27; SD = .63); "ability" (M = 4.20; SD = .48); "work with adolescents" (M = 4.13; SD = .61); "intrinsic career value" (M = 4.12; SD = .57); "job security" (M = 3.94; SD = .58); "enhance social equity" (M = 3.83; SD = .58); "shape the future" (M = 3.80; SD = .46); and "social influence" (M = 3.78; SD = .72). The sub-constructs "job transferability" (M = 3.26; SD = .70) and "time for family" (M = 3.07; SD = .71) represented the not sure category (2.60 – 3.50). The sub-construct "fallback career" (M = 2.25; SD = .81) represented the disagree category (1.56 – 2.50). Finally, the sub-construct "bludging" (M = 2.02; SD = .75) represented the definitely disagree category (.00 – 1.50).

Table 3
Sub-construct of Attitude about Teaching (n=145)

Construct Item	*M*	*SD*
Make a Social Contribution	4.38	.46
Prior Teaching and Learning	4.27	.63
Ability	4.20	.48
Work with Adolescents	4.13	.61
Intrinsic Career Value	4.12	.57
Job Security	3.94	.58
Enhance Social Equity	3.83	.58
Shape the Future	3.80	.46
Social Influence	3.78	.72
Job Transferability	3.26	.70
Time for Family	3.07	.71
Fallback Career	2.25	.81
Bludging	2.02	.75

Note: 1 = definitely disagree, 2 = disagree, 3 = neutral, 4 – agree, 5 = definitely agree

Objective four sought to identify students' intentions to teach secondary agricultural education upon graduation (see Table 4). Two sub-constructs for intent to teach were identified. The sub-construct "satisfaction with choice" (*M* = 4.29; *SD* = .72) indicated the students agreement in their choice to teach. The sub-construct "social dissuasion" (*M* = 3.48; *SD* = .70) indicated the extent to which others advised against pursuing a career in teaching agriculture.

Table 4
Level of Agreement on Intent to Teach Sub-constructs (n = 145)

Construct Item	*M*	*SD*
Satisfaction with Choice	4.29	.72
Social Dissuasion	3.48	.70

Note: 1 = definitely disagree, 2 = disagree, 3 = neutral, 4 – agree, 5 = definitely agree

Objective five sought to determine the relationship between students' beliefs about, attitude about teaching secondary agricultural education, intent to teach secondary agricultural education and their sex, perceived agriculture experience compared to their peers, years enrolled in school-based agricultural education courses, years of FFA membership, participation in SAE, and years of 4-H membership (see Table 5). Pearson's Product Moment (r) and point-biserial (r_{pb}) correlations were used determine the bivariate relationships. To interpret the magnitude of the correlation coefficients, the Davis (1971) conventions were used. The findings indicate a positive, low relationship between beliefs about teaching and the number of years students were members of the FFA (r = .20) and years enrolled in high school agricultural education (r =. 18). Students' intent to teach and sex (r_{pb} = -.13) and students' participation in FFA (r_{pb} = -.10) and beliefs had a negative, low correlations. Students' participation in 4-H (r_{pb} = .09) had a positive, negligible relationship with beliefs, while students' agriculture experience compared to their peers (r = -.09) had a negative, negligible relationship with beliefs. Students' participation in high school agricultural education (r_{pb} = -.08), SAE participation (r_{pb} = -.04), and years of membership in 4-H(r = -.03) had a negative, negligible relationship with beliefs.

The findings indicate a positive, low relationship between attitude about teaching and the number of years students were FFA members (r = .25) and the number of years enrolled in high school agricultural education (r =.18). Students' participation in SAE (r_{pb} = -.13) and the number of years of membership in 4-H (r = -.10) had a negative, low relationship with attitude. Students' agriculture experience compared to their peers (r = .07) and students' participation in 4-H (r_{pb} = .03) had positive, negligible relationship with attitude. While sex (r_{pb} = -.07), students' participation in high school agricultural education (r_{pb} = -.02) and students' participation in the FFA (r_{pb} = -.02) had negative, negligible relationships with attitude (see Table 5).

A positive, moderate relationship between students' participation in high school agricultural education (r_{pb} = .38) and students' beliefs about teaching was reported. Students' years of enrollment in high school agricultural education had a positive, low relationship (r = .15) with intent to teach. Sex (r_{pb} = -.12) and SAE experience (r_{pb} = -.12) had a negative, low relationship with intent to teach. Students' participation in FFA (r_{pb} = -.09), students' agriculture experience compared to their peers (r = -.07) and years of 4-H membership (r = -.05) reported a negative, negligible relationship with intent to teach. The number of years students were members of the FFA (r = .03) and students' participation in 4-H (r_{pb} = .01) reported a positive, negligible relationship with intent to teach (see Table 5).

Table 5
Bivariate Correlations between Selected Student Characteristics and Beliefs; Characteristics and Attitudes; and Characteristics and Intent (n = 145)

Characteristic	Beliefs[c]	Attitude[c]	Intent[c]
Years of FFA Membership	.20	.25*	.03
Years Enrolled in High School Agricultural Education	.18	.18	.15
Sex[a]	-.13	-.07	-.12
Participated in FFA[b]	-.10	-.02	-.09
Participated in 4-H[b]	.09	.03	.01
Agriculture Experience	-.09	.07	-.07
Participated in High School Agricultural Education[b]	-.08	-.02	.38*
Participated in SAE[b]	-.04	-.13	-.12
Years of 4-H Membership	-.03	-.10	-.05

Note: [a]1=Female; 2=Male; [b]1=Yes, 2=No; [ab]point biserial coefficients reported; [c]1 = definitely disagree, 2 = disagree, 3 = neutral, 4 – agree, 5 = definitely agree; $p < .05$*

Conclusions, Implications and Recommendations

The following conclusions, implications, and recommendations are based upon the findings of the study. Overall, agricultural education students' held a positive belief about teaching. "Expert career" or the beliefs about what teachers need to know or be able to do is supported by Stiegelbauer (1992); identifying that students wish to share personal knowledge and expertise about the subject. The findings suggest that students' beliefs about teaching regard it as a highly skilled occupation that is emotionally demanding, and requires technical and expert knowledge. The second sub-construct "social status" is supported in a study by Hayes (1990) who suggested that students thought teaching was a highly respected career.

Stakeholders in agricultural education should to tap into the talents and interests of students across the United States and recruit the best possible candidates into their programs. Therefore, promoting teaching as a professional career, which requires technical expertise, and a profession that is highly regarded is imperative. Teacher educators must continue to provide students' with the opportunity to gain the technical expertise they will need to become quality agriculture educators. In addition, to supporting teachers and promoting the profession as a career that is well respected, National and state FFA organizations, The National Association of Agricultural Educators, and American Association for Agricultural Education should continue to reward quality agriculture teachers and continue to promote the profession.

Beliefs about teaching sub-constructs "salary" and "high demand" were rated as not sure by the students'. This might suggest that students remained unsure of the financial rewards of becoming an agriculture teacher, and are uncertain of the demands placed on teachers. This study obtained data from students prior to student teaching. Consequently, students' may not be aware of the actual demands placed on agriculture teachers; even though they feel they have the skills necessary to perform the job. Teacher educators must provide opportunities for students' to observe agriculture teachers prior to student teaching and give them the chance to reflect on what they have seen. Perhaps the unsure belief about salary is a reflection of Herzberg's (1968) two-factory theory. Teacher educators should capitalize on this belief where students can showcase their skills and provide a service to others regardless of the salary they expect to earn.

Overall, agricultural education students tended to display a favorable attitude toward teaching. Students' value the social contribution they make as a teacher and the ability to give back to society. Local agricultural education programs are known for community service projects therefore, promoting service to others through agriculture education is vital. Perhaps a service learning project should be an additional component of teacher preparation coursework. Both prior teaching and learning experiences and being able to work with adolescents were positive for students, and were significant in determining their attitude toward teaching agricultural education. Based on the findings, it is suggested that current high school agricultural education teachers and teacher educators make a conscious effort to create positive learning environments. Secondary agricultural education teachers should acknowledge the recommendations made by Park and Rudd (2005) and be professional, respect students, mentor, and exhibit positive teacher attitudes as these behaviors tend to produce future teachers, while the opposite attitudes and practices tend to discourage students from teaching. Continued promotion of SAEs in the agricultural education area could provide additional recruitment opportunities for institutions.

The findings suggest that because of students' past experience and preparation in agriculture, agricultural education, FFA, SAE, and 4-H, they are confident in their "ability" to teach agriculture. This further supports the belief that agriculture education is a highly expert career where a significant amount of technical knowledge is needed. While the majority of these students have extensive experience in agriculture through FFA activities, SAEs, and 4-H membership, do these (and related) experiences alone contribute to the technical knowledge that is needed to teach? Technical content coursework should be encouraged and modified based on student needs especially areas where students are deficient. Teacher educators should work carefully to advise students' on the appropriate courses needed to enhance and strengthen their knowledge base.

The literature documents why students choose a career in teaching. It is to make a positive difference in the lives of adolescents, the desire to be a role model for students, and the enjoyment of working with adolescents (Hayes, 1990; Stiegelbauer, 1992). Capitalizing on the opportunity to work with adolescents is an additional factor that should be utilized in developing marketing and recruitment aids. Staff within the National FFA Organization should continue to develop strategies that target high school students and focus on agriculture teacher recruitment. An increased restoration of programs such as Partners in Active Learning Support (PALS) provides students with the opportunity to work with children early. Early field experiences and student teaching are an important element of the teacher education program, and positively impact preservice teachers of agricultural education (Edwards & Briers, 2001; Harlin Edwards, & Briers; Myers & Dyer, 2004). Once more, an increasing emphasis on early, positive field experiences should be planned by teacher educators.

Agricultural education students' "intrinsic career value" was rated high as well. With regard to teaching, it is suggested that students simply enjoy teaching about agriculture. Hayes (1990) identified that students majoring in education were strongly drawn to teaching for reasons other than monetary rewards. In regards to recruitment of teachers into agricultural education the enjoyment and passion about teaching could be considered another area to focus marketing efforts. Harms and Knobloch (2005) support the sub-construct "intrinsic career value," identifying that individuals teach to satisfy their needs. The students' intent to teach may be due to the enjoyment they get from teaching about agriculture. Key persons within the National FFA Organization, NAAE, state associations, teacher education and high school teachers should encourage students' to enter a profession that is satisfying.

Agricultural education students indicated that they have carefully thought about the decision to teach, are satisfied and happy with the choice to teach and indicated that others influenced their decision to become an agriculture teacher. Important to note is that students' disagreed that teaching agriculture education was considered a "fallback" career. In addition, there are minor concerns about "time for family," and "job transferability." At this point in their undergraduate program students are finalizing their decisions about their future and their career. While it is extremely positive that the students' have a solid hold on their future career choice, discouragement from others was not a strong factor in students' choice of teaching as a career. This contradicts finding by Richardson and Watt (2006) who reported strong experiences with social dissuasion from teaching. A joint effort to market and promote the profession is needed by all involved in agricultural education.

The findings indicate inconsequential relationship between students' characteristics and beliefs, attitude, and intent to teach agricultural education. However, the strongest relationship, a moderate, positive relationship between participation in high school agricultural education and the students' intent teach, suggests that students who were enrolled in high school agricultural education have a greater intent to teach high school agricultural education. While, the remaining characteristics including participation in FFA, SAE, 4-H, and the number of years involved, do not factor into students intent to teach. This finding is supported by the findings of Roberts, Greiman, Murphy, Ricketts, Harlin, & Briers (2009). This may support the idea of recruiting students from disciplines and backgrounds outside of the typical agricultural education environment. However, is also in contrast to previous research (Edwards & Briers, 2001; Kasperbaure & Roberst, 2007).

Teacher educators should continue to make teacher recruitment a priority and continue recruitment efforts from the traditional, time-honored sources. National and State leaders should make it a priority to recognize students who excel in agricultural education by continuing to provide sponsorships in the agricultural education proficiency award area. Recruitment materials, workshops, and the National Teach Ag day initiative should be expanded to include the factors that were identified as part of this study. Promoting agricultural education as a profession that taps into students' experience, provides a steady career path, contributes to society, and is a career where they get to work with kids.

Future research should go beyond this study to continue evaluation of the specific factors that influence students' intent to teach. Studies focused on atypical agricultural education students that assess the factors that influence choice to teach agricultural education are necessary. Such a study would allow comparisons of typical and atypical agricultural education students.

This would assist in determining what factors are influential to atypical students and aid in the development of initiatives and materials to attract diverse populations into agricultural education. Additionally, a longitudinal study of students majoring in agricultural education, from their freshman year through their first few years of teaching would allow researchers to identify and understand students' attitudes, beliefs and intent to teach as they grow and develop through the curriculum. This would allow researchers to identify specific areas to target for recruitment and retention. While the findings of this study indicate a positive attitude towards teaching agricultural education, much remains to be discovered.

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A Study of Pre-service Agricultural Education Students: Knowledge of Horticulture and Self-efficacy to Teach Horticulture

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Abstract

This study included pre-service agricultural education students (22) enrolled in an introductory horticulture course at Oklahoma State University. The purpose of this descriptive correlational study was to determine pre-service agricultural education students' knowledge of horticulture and their perceived self-efficacy to teach horticulture in secondary agricultural education. It was found that over two-thirds (68.2%) of the agricultural education students who participated in this study did not possess any years of horticulture work experience. Additionally, 63.9% reported they completed no high school horticulture courses, and 77.3% of the students had not completed any college horticulture courses. Prior to instruction, the students reported their self-efficacy to teach selected horticulture skills standards as "Below Average." However, at the end of instruction, the students perceived their self-efficacy to teach the selected horticulture skills standards as "Average confidence." It was revealed that students' horticulture knowledge mean test score increased from 48.32% prior to instruction to 62.96% at the end of instruction.

Introduction

Horticulture is an important and diverse industry in the United States. Major content areas of horticulture include nursery, floriculture, landscape, and turf (McMahon, Kofranek, & Rubatzky, 2007). This industry provided nearly two million jobs and generated 147.8 billion dollars in 2002 (Hall, Hodges, & Haydu, 2005). Krause et al. (2004) emphasized the economic impact of horticulture in the United States when they stated, "Horticulture is one of the fastest growing enterprises in U.S. agriculture . . . " and ". . . it produces over 10% of all income from agricultural products" (p. 375). Aspects of the horticulture industry comprise the curriculum of secondary agricultural education in many states, including Oklahoma (Oklahoma Department of Career and Technology Education, 2007). So, secondary agricultural education teachers should receive instruction during their pre-service preparation that will enable them to teach horticulture effectively.

"Research suggests that a good teacher is the single most important factor in boosting [student] achievement, more important than class size, the dollars spent per student, or the quality of textbooks and materials" (Wallis, 2008, p. 28). The No Child Left Behind Act (NCLB) was designed to ensure all students were being held to the same expectations; therefore, teachers need to be accountable for their practice and related student learning outcomes. Martin, Fritzsche, and Ball (2006) stated, "Accountability will be enforced primarily through yearly standardized testing to measure student performance" (p. 100). Because teachers are the single most important influence on student achievement, teacher education programs need to provide learning experiences for pre-service educators that impact their self-efficacy to teach pertinent subject matter.

Approximately, one-half of the 11,000 secondary agricultural educators in the United States teach horticulture courses (National FFA Organization, 2008). A large enrollment of secondary agricultural education students in horticulture classes in the United States demands that teachers be competent in horticultural knowledge and skills (Franklin, 2008). Wingenbach, White, Degenhart, Pannkuk, and Kujawski (2007) stated,

> Highly qualified teachers are defined in the No Child Left Behind Act of 2001 (NCLB) as those who not only possess state certification, but who also have content knowledge of the subjects they teach. In Career and Technical Education (CTE), teachers need to be competent in technical, employability, and academic skills. Additionally, high-quality CTWE [Career Technical/Workforce Education] teachers are essential in helping the United States develop a 21st-century workforce that will be competitive in the world marketplace. (pp. 114-115)

Teachers need to be "comfortable" (i.e., self-confident) in teaching horticultural science in addition to understanding the technical knowledge. Researchers who studied pre-service agricultural education students' knowledge and teaching comfort level concluded, "As pre-service teachers' knowledge increased, so did their teaching comfort and vice versa . . ." (Wingenbach et al., 2007, p. 123). Moreover, Knobloch and Whittington (2002) reported that when an agricultural educator has a high level of self-efficacy, he or she will be more effective teaching agricultural content to students than teachers who possess a low level of self-efficacy. Stripling, Ricketts, Roberts, and Harlin (2008) paraphrased Albert Bandura when they posited,

> Competent teachers and the expected skills they ought to possess may be the most important factors contributing to the success of students. Confidence in one's ability to be a skillful, effective, and competent teacher is important because this confidence generally leads to fulfillment of these expectations. (p. 120)

Theoretical/Conceptual Framework

The theoretical framework for this study was based on self-efficacy theory (Bandura, 1997). According to Bandura, "Perceived self-efficacy is the beliefs in one's capabilities to organize and execute the courses of action required to produce a given attainment" (p. 3). Self-efficacy differs from other expectancy beliefs, because it is based on a specific belief to obtain a predetermined outcome (Pajares, 1996). In this study, confidence to teach horticulture standards and self-efficacy are used interchangeably based on instrument development work done by Bandura (2006). Bandura (1989) expounded on the idea that as an individual's perceived self-efficacy increased, he or she would set higher goals. In addition to raising goals, the individual also will be able to endure and achieve difficult tasks or goals (Bandura, 1992).

Johnson, Ferguson, and Lester (2000) concluded that students who had used computer applications or believed they had a high skill level for operating selected computer applications had a high confidence level when using selected computer applications. Providing rationale for investigating pre-service educators' perceived self-efficacy, Zarafshani, Knobloch, and Aghahi (2008) stated, "General self-efficacy is a trait-like construct of a set of expectations people use to determine how successful they believe they can be or perform in a wide range of new and challenging situations" (p. 72).

In multiple types of efficacy (i.e., teacher efficacy or collective efficacy), the foundation of efficacy develops from four sources of information: mastery experiences, vicarious experiences, verbal persuasion, and physiological state (Bandura, 1997). Bandura stated that, "Each of the four modes of conveying information about personal capabilities has its distinctive set of efficacy indicators" (p. 79).

As pre-service students enter a teacher education program, a vision should be developed by the student to establish an idea or model which exemplifies effective teaching characteristics and a well developed foundation of content knowledge. The vision developed by a pre-service teacher impacts all other values, including understanding, practices, dispositions, and tools.

According to Darling-Hammond and Bransford (2005), each value can be described as follows: "Understanding" is the value in which a prospective educator develops pedagogical and content knowledge of a specific subject area; examples include agriculture, mathematics, construction engineering, and reading. "Practice" is an application process where a prospective educator would organize and execute lessons, per his or her specified content area. "Dispositions" could be abstract thought or structured reflection on practicing the teaching and learning process for students and teacher. The value "Tools" consists of items such as educational theories, teaching methods, and lesson plans, which the educator uses to construct and organize effective learning experiences.

Darling-Hammond and Baratz-Snowden (2005) stated, "Being prepared to teach subject matter requires deep content knowledge of the content itself, the process for learning this content, and the nature of student thinking, reasoning, understanding, and performance within a subject area" (p. 17). Content knowledge is one piece of the value "understanding." This is a value that educators must develop and organize to teach students effectively.

This study primarily investigated knowledge-*for*-practice, because of its focus on pre-service education (Cochran-Smith & Lytle, 1999). Embedded in this relationship is the knowledge a teacher gains through formal education in preparation for the teaching profession (Cochran-Smith & Lytle). Feiman-Nemser (2001) stated, "If teachers are responsible for helping students learn worthwhile content, they must know and understand the subjects they teach" (p. 1017). Additionally, the knowledge teachers gain from pre-service education is knowledge which average people in society would generally not know (Cochran-Smith & Lytle). Pre-service education is where a teacher gains the pedagogical skills and content knowledge, per his or her discipline, within the knowledge-*for*-practice relationship (Cochran-Smith & Lytle).

In this study, the mean grade point average (GPA) in the required introductory horticulture course for teacher licensure was lower historically when compared to other required agricultural courses. Also, the expected mean score on the horticulture segment of the Oklahoma Agriculture Subject Area Examination was lower then expected over three years. These assessment measures, along with observations by faculty in horticulture and agricultural education provided rationale to conduct this study: Determine the horticulture knowledge pre-service agricultural education students gained in the required horticulture course and their perceived level of self-efficacy to teach horticulture.

Purpose and Objectives

The two-fold purpose of this descriptive-correlational study was to determine pre-service agricultural education students' knowledge of horticulture and their perceived self-efficacy to teach horticulture in secondary agricultural education.

1. Describe selected personal characteristics (age, gender, major, academic course work in horticulture, and horticulture work experience) of pre-service agricultural education students enrolled in a required introductory horticulture course at Oklahoma State University.

2. Describe pre-service agricultural education students' knowledge of selected horticulture skills standards in secondary agricultural education.

3. Describe students' perceived self-efficacy to teach selected horticulture skills standards in secondary agricultural education.

4. Describe the relationship between the pre-service agricultural education students' perceived self-efficacy to teach selected horticulture skills standards and their knowledge of horticulture and years of horticulture work experience.

Methods and Procedures

The population for this study included pre-service agricultural education students enrolled in a required introductory horticulture course. A total of 22 pre-service students were enrolled in the course during the fall 2008 semester. All students were majoring in agricultural education or a related option with the intent of seeking a license to teach agricultural education in grades 6-12.

A review of literature found that no instruments were available to measure a student's horticultural knowledge and perceived confidence to teach horticulture skills standards relevant to the state's secondary agricultural education curricula. Therefore, the researcher (Kennel, 2009) developed an instrument which included three sections: Section I, Perceived Confidence and Importance to Teach Horticulture Skills Standards; Section II, Horticulture Knowledge; and Section III, Personal Characteristics Information (age, gender, major, academic course work and experience in horticulture).

Section I of the instrument was developed to investigate the pre-service agricultural education students' perceived confidence (i.e., self-efficacy) to teach selected state horticulture skills standards. The selected state horticulture skills standards identified for this study were cross-referenced with the horticulture course's content. After cross-referencing the skills standards and the course content, 27 horticulture skills standards were identified and used to formulate Section I. In developing Section I of the instrument, the researcher used the construct "confidence" to measure a pre-service student's self-efficacy to teach the selected skills standards (Bandura, 2006). To determine self-efficacy, the researcher used a five point summated rating scale: "1" = "No confidence," "2" = "Below average confidence," "3" = "Average confidence," "4" = Above average confidence," and "5" = "High confidence." Section II, Horticulture Knowledge, consisted of a 27 question objective test. Standards developed by the Oklahoma Department of Career and Technology Education (2007) guided the selection of the horticulture knowledge questions included on the horticulture knowledge test section of the instrument. After cross-referencing the state horticulture skills standards to the course content of the introductory horticulture course, the researcher selected 27 skills standards that were included in the course's content (Kennel, 2009). These horticulture skills standards were used, because agricultural education teachers are expected to be able to teach the skills on completion of their Bachelor's of Science degree and receipt of initial teaching license in agricultural education in this state (Leising, Edwards, Ramsey, Weeks, & Morgan, 2005).

The selected skills standards were cross-referenced to the course's test question bank to establish congruency between course content and the skills standards. The questions in this test question bank had been used in the course for approximately 10 semesters and were considered valid by the faculty teaching the course. Each test question was cross-referenced directly to one of the state's agricultural education horticulture skills standards. These 27 questions composed the criterion-referenced horticulture knowledge test, i.e., Section II of the instrument.

Content validity of the instrument used in this study was reviewed by a panel of experts that consisted of two horticulture faculty members, two teacher educators in agricultural education, two agricultural educators possessing six or more years of experience teaching horticulture, and one agricultural communications faculty member (Wiersma & Jurs, 1990). The panel of experts reviewed the instrument to confirm face and content validity.

This instrument was field tested with pre-service agricultural education students enrolled in an agricultural education program planning course in spring 2008. A total of 44 students participated in the field test and were asked to write comments about ways to clarify the wording of the instrument and to identify questions that were unclear or vague. As a result of the field test, the instrument was edited further and the format was adjusted, but no change in its content was made.

An instrument's reliability is addressed to determine if the instrument could be utilized multiple times and produce similar responses (Hambleton & Novick, 1973; Wiersma & Jurs, 1990). Criterion-referenced tests, such as the horticulture knowledge test in this study, do not require reliability coefficients (e.g., Cronbach's coefficient alpha) to address reliability, as do norm references tests (Wiersma & Jurs, 1990). However, Wiersma and Jurs (1990) posited eight ways to address reliability of a criterion-referenced test. The researcher adhered to these guiding principles when responding to the panel of experts' feedback regarding improvements to the study's instrument.

To that end, the researcher addressed the suggestions posed by Wiersma and Jurs (1990) to increase reliability of the instrument as follows: *Homogeneous items:* the questions utilized in the criterion-referenced test were cross-referenced directly with the agricultural education horticulture skills standards and the introductory horticulture course's content; *discriminating items:* all items on the instrument were analyzed using item difficulty scores calculated by the university assessment and testing center; e*nough items:* the criterion-referenced test included 27 test questions and each question was cross-referenced to a horticulture skill standard. Twenty seven of the 278 horticulture skills standards were used. These were representative of the skills standards taught in the introductory horticulture course; *high quality copying and format:* the instrument booklet was copied using a laser ink jet copier and the Scantron forms were professionally formatted by the Oklahoma State University assessment and testing center. The panel of experts reviewed the instrument's format and students involved in the field test also made suggestions to eliminate ambiguous wording; *clear directions for the students:* the students were provided written instructions explaining how to complete the Scantron forms; a *controlled setting:* the instrument was administered in a classroom setting during a regularly scheduled class session on the university's campus; *motivating introduction:* the detailed informed consent form included an introduction that informed the students how the data collected from the instrument would be used; *clear directions to the scorer:* the Scantron forms completed by the study participants were electronically scored by the university assessment and testing center.

The instrument was administered to 22 pre-service agricultural education students in August 2008 prior to instruction in the introductory horticulture course, and at the end of instruction in late November 2008. The instrument was administered in two parts: first, Section I, Perceived Confidence and Importance to Teach Horticulture Skills Standards was administered, and second, Section II, Horticulture Knowledge Test, and Section III, Personal Characteristics Information. All instruction addressing the skills standards except "temperature and moisture requirements for postharvest plant storage" had occurred prior to the testing date. Because that skill standard was not taught prior to the second administration, the researcher did not use data from this skill standard either prior to or at the end of instruction; so, data for 26 skills standards were analyzed (Kennel, 2009).

The programs SPSS 15.0 for windows and Microsoft Excel 2007 were used by the researcher to analyze the data. The researcher used frequencies, population means, and population standard deviations to describe selected personal characteristics of pre-service agricultural education students and their self-efficacy to teach selected horticulture skills standards. The researcher calculated a non-parametric Kendall's *tau* correlation coefficient between students' self-efficacy to teach horticulture, horticulture knowledge achievement score, and years of horticulture work experience. A Kendall's *tau* correlation coefficient should be used ". . . when you have a small data set with a large number of tied ranks" (Field, 2000, p. 92). To classify the correlation coefficients, the researcher used Davis' (1971) conventions to describe the magnitudes of the correlations.

Findings/Results

Objective 1. Describe selected personal characteristics of pre-service agricultural education student enrolled in the required introductory horticulture course.

Of the total population, 11 students (50%) were 21 years old, seven (31.8%) were female, and 15 (68.2%) were male. Slightly more than 50% (12) of the pre-service agricultural education students reported a grade point average (GPA) ranging from 3.1-4.0, and 10 students indicated a GPA ranging from 2.1-3.0. Additionally, 63.6% (14) were majoring in only agricultural education; however, 36.4% (8) were earning double majors in animal science and agricultural education. Based on the Oklahoma State University classification of students, the population included 4.5% (1) freshman (< 28 earned semester credit hours), 18.2% (4) sophomores (28 to 59 earned semester credit hours), 36.4% (8) juniors (60 to 93 earned semester credit hours), and 40.9 % (9) seniors (≥ 94 earned semester credit hours).

The majority (68.2%) of the agricultural education students who participated in this study did not report any years of horticulture work experience. Five students indicated one or more years of horticulture work experience. Only 27.3 % of the students participated previously in agricultural education horticulture activities, and 4.5% of the students were involved in 4-H horticulture activities. Of the total population, 63.9% of the students reported they completed no high school horticulture courses, and 77.3% of the students had not completed any college horticulture courses at the time of the study.

Objective 2. Determine the pre-service agricultural education students' knowledge of selected horticulture skills standards.

The pre-service agricultural education students enrolled in the introductory horticulture course completed a criterion-referenced test prior to and at the end of instruction. The mean percent correct on the criterion-referenced test prior to instruction was 48.32% and the end of instruction mean was 62.96% (Table 1).

Table 1

Pre-service Students' Knowledge Test Scores in Horticulture Prior to and at the End of Instruction

			Range	
	μ	σ	Minimum (%)	Maximum (%)
Prior to Instruction Test Scores	48.32	12.44	25.93	74.07
End of Instruction Test Scores	62.96	14.14	33.33	88.89

Objective 3. Determine the pre-service agricultural education students' perceived self-efficacy to teach horticulture.

To determine self-efficacy of the pre-service agricultural education students, a self-efficacy mean score was calculated for each of the skills standards (Table 2). Prior to instruction, students perceived their self-efficacy to teach the selected horticulture skills standards as "Below average" ($\mu = 2.37$). Two skills standards, "plant propagation using air layering" ($\mu = 1.59$) and "techniques of seed stratification" ($\mu = 1.95$), were perceived as "No confidence" to teach. At the end of instruction, students perceived that they held "Average confidence" for 20 of the 26 skills standards. However, regarding the remaining six skills standards the students perceived their self-efficacy to teach the horticulture skills standards as "Below average" (Table 2).

Prior to instruction, students had higher self-efficacy to teach "operation of different kinds of turf/lawn mowers" ($\mu = 2.91$), "irrigation of field grown plants" ($\mu = 2.91$), "the effects of insufficient spacing of plants" ($\mu = 2.77$), "maintenance practices of cool and warm season grasses" ($\mu = 2.64$), and "the effects of overspraying and underspraying diseased plants" ($\mu = 2.59$) than after. However, the five standards were classified as "Below average" (i.e., $\mu = 2.00$-2.99) (Table 2). Conversely, students perceived themselves as least efficacious to teach "techniques for grafting trees" ($\mu = 2.09$), "techniques for applying rooting hormone" ($\mu = 2.05$), "preparation techniques of growing media" ($\mu = 2.00$), "techniques of seed stratification" ($\mu = 1.95$), and "plant propagation using air layering" ($\mu = 1.59$) prior to instruction (Table 2).

Table 2 also includes students' perceptions of self-efficacy to teach the selected horticulture skills standards at end of instruction for the course. The students' indicated highest perceived self-efficacy for teaching five of the skills standards: "techniques for applying rooting hormone" ($\mu = 3.77$), "techniques for pinching plants" ($\mu = 3.73$), "techniques of seed stratification" ($\mu = 3.73$), "techniques for disbudding plants" ($\mu = 3.64$), and "transplanting plant materials to the field" ($\mu = 3.59$). Two skills standards, "techniques for applying rooting hormone" and "techniques of seed stratification," rated as least efficacious prior to instruction, were rated in the top five at the end of instruction.

At the end of instruction, the five skills standards for which pre-service students perceived they held the lowest self-efficacy were "preparation techniques of growing media" ($\mu = 2.95$), "the effects of plant photoperiod regulation" ($\mu = 2.86$), "maintenance of greenhouse irrigation systems" ($\mu = 2.82$), "harvesting techniques of trees and shrubs" ($\mu = 2.77$), and "identification of common turf diseases and pests" ($\mu = 2.59$) (Table 2).

Overall, pre-service agricultural education students' perceived self-efficacy to teach horticulture increased from prior to instruction ($\mu = 2.37$) compared to the end of instruction ($\mu = 3.26$). The students' self-efficacy mean scores were divided between "Average confidence" (3.00-3.99) and "Below average" (2.00-2.99) at the end of instruction. This differs from prior to instruction, because the majority of responses were "Below average" ($\mu = 2.00$-2.99). No notable differences in students' perceived self-efficacy were detected within or among the three thematic areas of the course: greenhouse/nursery; fruit/nut and vegetable; and landscape maintenance.

Table 2

Comparison of Pre-Service Agricultural Education Students' Perceptions of Self-efficacy to Teach Select Horticulture Skills Standards Prior to and at the End of Instruction

	Self-efficacy				
	PI[a]		EI[b]		Mean
Skills Standards	μ	σ	μ	σ	Diff.
Greenhouse/Nursery					
Transplanting techniques for trees that are bare-root or in liners	2.27	0.98	2.95	1.05	+ 0.68
Techniques for pinching plants	2.45	1.06	3.73	1.03	+ 1.28
The effects of insufficient spacing of plants	2.77	0.87	3.23	1.07	+ 0.46
Techniques for applying rooting hormone	2.05	1.13	3.77[c]	1.11	+ 1.72
Planting techniques for shrubs and trees: bare-root, container, & burlap	2.32	0.78	3.14	0.89	+ 0.82
Plant propagation using air layering	1.59[d]	0.96	3.18	1.05	+ 1.59
Techniques for disbudding plants	2.23	1.06	3.64	0.95	+ 1.41
Maintenance of greenhouse irrigation systems	2.27	0.98	2.82	0.96	+ 0.55
Scarification of seeds	2.36	1.14	3.45	1.01	+ 1.09
Appl. techniques of plant growth regulators	2.59	1.01	3.50	0.80	+ 0.91
The effects of plant photoperiod regulation	2.32	0.99	2.86	0.71	+ 0.54
ID of bulbs, tubers, & tuberous roots	2.36	1.18	3.55	1.06	+ 1.19
Harvesting techniques of trees & shrubs	2.18	1.05	2.77	1.07	+ 0.59
Composite mean	2.29		3.28		+ 0.99
Fruit/Nut & Vegetable					
Techniques for grafting trees	2.09	0.81	3.05	0.72	+ 0.96
Calculating seed germination percentages	2.45	1.18	3.32	1.04	+ 0.87
Techniques of seed stratification	1.95	0.90	3.73	0.94	+ 1.78[c]
Preparation techniques of growing media	2.00	0.87	2.95	0.90	+ 0.95
Hardening-off process of seedlings & cuttings	2.18	0.96	3.18	1.01	+ 1.00
Techniques for pruning trees	2.59	1.10	3.36	0.90	+ 0.77
Techniques for staking trees	2.45	0.96	3.23	1.11	+ 0.78
The effects of over/underspray. diseased plts	2.59	1.14	3.09	0.68	+ 0.50
Irrigation of field grown plants	2.91	0.87	3.45	0.80	+ 0.54
Transplanting plant materials to the field	2.55	0.86	3.59	0.91	+ 1.04
Composite mean	2.38		3.30		+ 0.92
Landscape Maintenance					
ID of common turf diseases & pests	2.55	1.10	2.59[d]	0.80	+ 0.04[d]
Maint. pract. of cool & warm season grasses	2.64	0.90	3.23	0.87	+ 0.59
Oper. of different kinds of turf/lawn mowers	2.91[c]	1.02	3.50	1.06	+ 0.59
Composite mean	2.70		3.11		+ 0.41
Overall Composite Mean	2.37		3.26		+ 0.89

Note. Self-efficacy scale: "1"= "No confidence"; "2" = "Below average confidence"; 3 = "Average confidence"; "4" = "Above average confidence"; "5" = "High confidence"
[a]Prior to Instruction; [b]End of Instruction; [c]Maximum; [d]Minimum

Objective 4: Determine the relationship between pre-service agricultural education students' perceived self-efficacy to teach selected horticulture skills standards and their knowledge of horticulture and years of horticulture work experience.

A low positive correlation (Davis, 1971) was found between self-efficacy to teach horticulture and horticulture knowledge at the end of instruction; a negligible negative correlation was found prior to instruction (Table 3). The researcher also computed a Kendall's *tau* correlation coefficient to determine if a relationship existed between self-efficacy to teach horticulture and horticulture work experience (Table 3). A low positive correlation was found prior to instruction; however, a negligible negative correlation was found at the end of instruction.

Table 3

Kendall's tau (τ) Correlation Coefficient Between Pre-service Teachers' Perceived Self-efficacy, Horticulture Knowledge, and Work Experience Prior to and at the End of Instruction

	Horticulture Knowledge		Work Experience	
	Prior to Instruction τ	End of Instruction T	Prior to Instruction τ	End of Instruction τ
Self-efficacy	-.050[a]	.178[b]	.161[b]	-.091[a]

Note. [a]Correlation coefficients ranging from -.01 to -.09 are negligible negative associations; [b]correlations coefficients ranging.10 and .29 are low positive associations (Davis, 1971).

Conclusions and Recommendations

A majority of pre-service agricultural education students in this study were male. They possessed similar characteristics including age, major, and grade point average when compared to studies conducted by Young and Edwards (2006) and Johnson, Ferguson, and Lester (2000). More than one-half of the population was classified as junior or senior students. Similar to Franklin (2008), over two-thirds of the students had no years of horticulture work experience. Also, the pre-service agricultural education students reported not being enrolled in any college-level horticulture courses before enrolling in the introductory horticulture course studied.

Students' horticulture knowledge of the selected skills standards increased from the beginning to the end of instruction. Although an increase in horticulture knowledge was revealed, it should be noted that the mean horticulture knowledge score was equivalent to a grade of "D" (60-69%) at the end of instruction, based on the grading scale used in the course.

Regarding research objective three, the pre-service agricultural education students' overall mean self-efficacy scores to teach horticulture skills standards increased from the beginning (2.37) to the end of instruction (3.26). The five skills standards with the highest self-efficacy mean scores, i.e., "Average confidence," were "techniques for applying rooting hormone" (3.77), "techniques for pinching plants" (3.73), "techniques of seed stratification" (3.73), "techniques for disbudding plants" (3.64), and "transplanting plant materials to the field" (3.59). Notably, these skills standards were taught using applied teaching methods in the laboratory portion of the course. This conclusion was supported by Bandura (1997): As students' range of mastery experiences expands, self-efficacy will increase or decrease depending on the quality of the experiences.

Concerning research objective four, a low positive correlation existed at the end of instruction between pre-service agricultural education students' horticulture knowledge and their perceived self-efficacy to teach horticulture. However, prior to instruction, a negligible negative correlation existed between horticulture knowledge and self-efficacy to teach horticulture. Although the correlation coefficients were not statistically significant, the relationships found were supported by Bandura's theory of self-efficacy (Bandura, 1997). As pre-service agricultural education students' horticultural knowledge increased, their self-efficacy to teach horticulture increased. Wingenbach et al. (2007) reported similar findings for pre-service agricultural education teachers in Texas.

The correlation coefficients calculated between years of horticulture work experience and self-efficacy were supported by the theory of self-efficacy (Bandura, 1997). Students' years of horticulture work experience did not change during the study, but students' self-efficacy increased from the beginning to the end of instruction. Therefore, the negative relationship between years of horticulture work experience and self-efficacy found at the end of instruction was anticipated.

Caution should be taken when generalizing the results of this study beyond the population examined and/or similar groups of students who may enroll for the horticulture course that was investigated. Further, due to the small population size of this study, it is recommended that this study be replicated over multiple semesters to determine if a relationship exists between self-efficacy to teach horticulture and horticulture knowledge in other groups of students and other pre-service agricultural education programs. Also, research should be conducted to determine if the horticulture instructional needs of pre-service agricultural education students at other universities are similar or different to those described in this study.

In this study, pre-service agricultural education students perceived their self-efficacy to teach horticulture as "Average confidence." The relatively unremarkable self-efficacy reported also raises questions regarding the self-efficacy of in-service agricultural teachers who teach horticulture and their knowledge of horticulture. Therefore, it is recommended that the self-efficacy of in-service agricultural education teachers be studied to understand better the role that experience may play regarding a teacher's perception of self-efficacy to teach horticulture.

The pre-service agricultural education students studied possessed very little knowledge about horticulture prior to enrolling in the introductory horticulture course. However, the majority of pre-service agricultural education students reported they had been enrolled in secondary agricultural education programs or participated in 4-H programs as youths. To assist students in gaining horticulture experience, secondary agricultural education teachers as well as 4-H educators and adult volunteers should promote more educational experiences focused on students acquiring horticulture knowledge and skills.

It was found that students were most efficacious to teach skills standards that were learned in the laboratory portions of the course. So, it is recommended that the course's instructors consider using additional applied teaching and learning methods when teaching students horticultural principles and concepts (Bandura, 1997).

Implications/Discussion

According to the Oklahoma Department of Career and Technology Education, horticulture is a career pathway that may be taught in secondary agricultural education programs. Based on the findings of this study, pre-service agricultural education students are entering college with minimal horticulture knowledge. Additionally, pre-service students bring ideas about what their teacher preparation should encompass to their initial professional development experiences (Feiman-Nemser, 2001). Accordingly, students who have not been exposed to horticulture educational experiences or horticulture work experiences prior to college may consider this context of agriculture less valuable than others. These individuals whom have not had experiences via the four sources of efficacy, i.e., mastery experience, vicarious experience, physiological state, or verbal persuasion, would be expected to possess low self-efficacy regarding the accomplishment of specific tasks (Bandura, 1997).

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Identifying barriers: Reasons graduates do not enter agricultural education.

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Abstract

In the midst of a continued teacher shortage in agricultural education, there is a lack of understanding as to why graduates of agricultural teacher education programs do not enter secondary agriculture teaching. The primary purpose of this mixed methods study was to identify barriers influencing agricultural teacher education graduate's decision to not enter the teaching profession as secondary agricultural educators. The seven Northwest Land Grant University agricultural teacher education programs produced 33 graduates, of which nine did not enter the secondary agricultural education profession. Despite the seven Northwest states having 102 secondary agricultural education positions available, nine of the 33 graduates were not in a position to, or unwilling to relocate. The majority of these students were place bound, being committed to significant others, and were unwilling to take positions more than 45 miles from "home." Further, if all of the graduates would have attained agriculture teaching positions, there still would have been a great demand for teachers. This emphasizes the need for more graduates. To recruit pre-service teachers efficiently, identifying where future positions will likely be available would provide a geographic target area from which to recruit.

Introduction/Theoretical Framework

The purpose of agricultural teacher education departments within universities is to prepare graduates for teacher certification and to teach in secondary agricultural education programs. Barrick (1993) shared that the central mission of the agricultural teacher education department within universities is to prepare educators in agriculture.

However, the study of the teaching/learning processes studied in departments is easily applied to other disciplines, especially extension education and communication within agriculture. As a result, departments are also capable of preparing students for other fields as well (Barrick, 1993). Hillison, Camp, and Burke (1987) suggested that the agricultural education degree is broad-based enough that it meets "the needs of students who plan to teach as well those who desire other professional endeavors" (p. 2).

Because agricultural teacher education graduates are prepared for multiple career options, some qualified graduates choose not to enter the teaching profession. While this might appear to be an asset for departments in terms of program viability; a potential challenge arises if those programs fail to meet their central mission if secondary agriculture positions are not filled with highly qualified graduates because they choose not to teach. As a result, it could prove difficult to produce enough graduates who choose to enter the profession to fill teaching vacancies at the secondary level.

Within agricultural education, our country has faced a "very real teacher shortage since the 1960s" (Team AgEd, 2006, p. 24). Craig (1984, as cited in Hillison, et al., 1987, p. 2) found "while the number of graduates from teacher education programs in agriculture was sufficient to supply the demand for teachers, the percentage of graduates accepting teaching positions declined, thereby leaving a net shortage of qualified teachers."

The continuous teacher shortage has been documented to as early as the 1960s where only 27% of Texas A&M graduates from the years 1960-1964 entered the teaching profession (Otte & Webb, 1970). In Pennsylvania, McCoy and Mortensen (1983) found that over the five year period from 1975 to 1980 only 61% of the Pennsylvania State University agricultural education teaching graduates chose to enter teaching. In Oregon, Cole (1984) found that over a twelve year period from 1971 to 1982, only 68% of the Oregon State University graduates chose to enter teaching. In 1989, McGhee and Cheek followed up with graduates from the University of Florida agricultural education teacher program from 1975 to 1987. McGhee and Cheek found that 74% of their graduates chose to teach agriculture upon graduation. In 1991, Baker and Hedges followed up with graduates from the agricultural education teacher program at the Ohio State University from 1980 to 1986 and found that only 52% of their graduates chose to teach agriculture. In Iowa, Mueller and Miller (1993) found that 57% of Iowa State's graduates in 1987 chose to enter teaching upon graduation and certification.

Brown (1995) found that nearly half of the agricultural teacher education graduates across the nation between 1965 and 1995 chose not to enter the profession of teaching agriculture. Brown concluded that during the years of the study, there were enough graduates across the nation to prevent a teacher shortage, but they were not sufficiently recruited into teaching.

According to Camp's (2000) *A National Study of the Supply and Demand for Teachers in Agricultural Education in 1996-1998*, the percent of newly qualified teaching graduates across the nation entering teaching agriculture had climbed to 64%, a figure which had not been reached since 1965. The most recent national teacher shortage data available for preservice agricultural education teachers found that those teachers who became qualified to teach, compared to those who actually entered the teaching profession, was 69.8% in 2006 (Kantrovich, 2007). The number of newly qualified teachers has risen from 2001's 59.4% (Camp, Broyles, & Skelton, 2002**).** With only 53% of the newly qualified agriculture teachers at the national level projected to enter the field in 2007, "This [teacher shortage trend] has the potential to reach epidemic proportions…" (Kantrovich, 2007, p. 37). In 2001, Camp et al. (2002) found that due to teacher shortages, 35 secondary agricultural education programs across the United States closed, 55 programs closed in 1998, and 41 programs closed in 1995 due to the lack of highly qualified teachers.

Considering the documented teacher shortage and closing of agriculture programs, the National Council for Agricultural Education's "Long Range Strategic Goal" proposed the 10 by 15 initiative to have 10,000 quality agricultural education programs by 2015 (Team AgEd, p. 18, 2006) to motivate agricultural teacher education programs to rethink recruitment and retention. Currently there are approximately 8,000 secondary agricultural education programs in our country (Team AgEd, 2006). Using these statistics it is likely that the teacher shortage will only become more significant over the coming years and leads to the need of this study. Because of this gap and shortfall, the *National Research Agenda* (Osborne, n.d.) clearly identifies one of its' twenty-two research priority areas as "prepare and provide an abundance of fully qualified and highly motivated agricultural educators at all levels" (p.5).

Evidence suggests, but does not confirm, that the Northwest is experiencing the same teacher shortage as indicated by the national statistics. For many years, the Western Region of the American Association for Agricultural Education (AAAE) has collected data including available graduates and vacant positions within the 13 states of the western region (personal communication, Jack Elliot, Western Region- American Association for Agricultural Education president-elect, April 25, 2007). However, these data consist of the "best guesses" of teacher educators at AAAE member institutions and the agricultural education program manager in their respective states. Therefore, it is possible that this report includes unintentional errors.

For the purposes of this study, the Northwest area of the United States includes Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming. This area was chosen due to similarities between these states including the number of statewide agriculture teacher preparation programs, program enrollment, and faculty per program. Furthermore, agricultural education graduates from Northwest Land-Grant Universities can teach in other Northwest states with minimal additional requirements. The remaining six states within the Western Region of AAAE (Alaska, Arizona, California, Colorado, Hawaii, and New Mexico) were excluded because the project is part of a regional effort. However, agricultural education in these six states is considerably different than the seven Northwest states. For example, in California there are five teacher preparation programs as compared to the seven Northwest states in which there is only one per state. In addition, states such as Alaska and Hawaii are extremely small in terms of number of secondary agricultural education programs and have no true teacher education program for agricultural education in their states.

With programs closing because of the teacher shortage, the question was asked, "what can we do to increase the number of graduates who seek teaching careers?" (Team AgEd, 2006, p. 24). To address this important question, "We need to research these questions at all levels (state, regional, and national) in order to find viable solutions" (Team AgEd, 2006, p. 24). Roberts, Harlin, and Ricketts (2006) identified three solutions: (1) increase the number of agricultural education graduates, (2) increase the percent of agricultural education graduates who choose to enter teaching, or (3) find alternative sources to supply agriculture teachers. Due to the lack of accurate empirical evidence, it is difficult to tell if the seven Northwest agricultural teacher education programs should focus their attention on solution one, or solution two, or both. Accurate benchmark data will provide insight as to where future emphasis should be placed for maximum benefit.

While a national teacher shortage is quite evident in the literature, data does not clearly provide the Northwest a precise outlook on the number of graduates from each Land-Grant University and whether they enter the teaching profession, nor does the data identify the number of secondary agricultural education positions in each Northwest state. According to Rocca and Washburn (2005), the "agricultural education literature provides little explanation of the factors that contribute to the teacher shortage" (p. 270).

Researchers have attempted to explain why only 60% of agricultural teacher education graduates choose to enter teaching agriculture at the secondary level (Foster, 2001; Harms & Knobloch, 2005; Rocca & Washburn, 2006; Swan, 2005; Warner & Washburn, 2007). While researchers have tried to explain factors influencing why graduates intend to enter the teaching profession, they have not linked their findings related to these intentions to the numbers of graduates who actually entered the profession, creating a void in the literature at the state, and ultimately regional and national levels.

Foster (2001) investigated barriers to enter agricultural teaching at the secondary level for females across the nation. She identified several emerging barriers for females who entered the teaching profession that included time for family and children, choosing not to have a family, fear of having a family, dealing with guilt, spousal support, and single mother issues. It is interesting to note that the respondents to Foster's national study were the females that had entered the teaching profession. However, the study failed to include female graduates who did not enter the teaching profession.

Warner and Washburn (2007) explored the experiences of first year teachers in urban agricultural education programs in Florida. Through their reflections, these graduates indicated that they felt more comfortable in an urban program than rural program and therefore accepted positions in urban areas. While this could be a factor related to why some graduates choose to teach or not to teach, Warner and Washburn did confirm if the participants in their study would have accepted a position in a rural program.

Rocca and Washburn (2006) created a prediction model based upon the Social Cognitive Career Theory (Lent, Brown, & Hackett, 1994) to "describe the influence and predictive nature of person inputs, contextual influences, self-efficacy, and outcome expectations on preservice teachers' intentions to teach, and on their intended length of teaching tenure" (p.157). Rocca and Washburn utilized a convenience sample of 262 student teachers from 34 agricultural teacher education programs representing 25 states across the country and found that two variables, teacher efficacy score and teaching expectations score, yielded the best model in predicting teaching intentions and accounted for 44% of the variance. Of the graduates who responded (n=212), 80% intended to teach. However, Rocca and Washburn did not collect data of who actually entered the profession and therefore recommended that the study be replicated and a follow up conducted to determine which graduates actually taught secondary agriculture.

Swan (2005) investigated the student-teaching group at Ohio State (N=34) and concluded that the level of the student teacher's intrinsic motivation at the end of the student teaching experience explained 26% of the variance towards teaching intentions. The higher the intrinsic motivation, the more likely the student teacher was to enter teaching. Swan found that 82% of graduates at Ohio State intended to teach, yet did not follow up to determine actual percentages of those who entered the profession.

Harms and Knobloch (2005) investigated agricultural education student teachers from four universities within Illinois (N=29) and concluded that the group of agriculture student teachers that intended to teach had more teacher efficacy and were more intrinsically motivated than extrinsically motivated than the group that was not intending to teach. Harms and Knobloch found that 83% of graduates at the four Illinois Universities intended to teach. Once again, no data were collected to determine the actual percentages of who entered the profession.

While recent data indicate that 80 to 83% percent of graduates intended to teach agriculture upon graduation (Harms & Knobloch, 2005; Rocca & Washburn, 2006; Swan, 2005), the data do not confirm that 80 to 83% actually enter the profession. The most recent national data indicates that only 69.8% of graduates become employed in secondary agricultural education (Kantrovich, 2007), yielding a net difference that to date is unexplained. Perhaps the states in the studies are not experiencing the same teacher shortage experienced at the national level, or perhaps all of the graduates with intentions to teach did not actually enter the profession.

Given the fact that discrepancies exist related to the national data, it is safe to assume that possible discrepancies exist in the Northwest as well. No studies have examined if a teacher shortage exists in the Northwest, or attempted to identify and explain why graduates in the Northwest enter or do not enter teaching as a profession. Thus, the following questions need to be answered. What are the current Northwest agricultural teacher education graduates choosing for careers? What are the factors for those Northwest graduates choosing and not choosing to enter teaching secondary agriculture?

Despite research efforts to identify factors that explain why graduates choose to enter or not enter teaching as a profession, Rocca and Washburn (2005) concluded that "additional research examining the career decisions of agricultural education is greatly needed in order to address the root causes of the shortage of teachers". This will help agricultural education teacher-education programs in the Northwest determine if a teacher shortage exists, and if it does which of the solutions outlined by Roberts, et al. (2006) should receive the most attention.

Purpose and Objectives

The primary purpose of this study was to identify factors influencing the agricultural teacher education graduate's decision to enter or not enter the teaching profession as secondary agricultural educators in seven northwestern states.

Specific objectives of this study included:

1. Determine how many students in the seven Northwest Land-Grant Universities completed an agricultural teacher education program.

2. Determine how many students in the seven Northwest Land-Grant Universities completed an agricultural teacher education program and were certified by the state's certifying agency in the same academic year as they completed their program.

3. Determine how many graduates of agricultural education teacher education programs in the seven Northwest Land-Grant Universities received certification and accepted positions as secondary agricultural science and technology instructors in the next academic year following graduation.

4. Compare the number of Northwest agricultural education teacher education program graduates who received certification to the number of teachers needed.

5. Identify factors influencing a certified Northwest agricultural teacher education program graduate's decision not to enter the teaching profession.

Methodology

This study utilized a mixed methods data-collection process. Harms and Knobloch (2005) recommended the mixed methods research approach to understand further the underlying rationale for agricultural education teacher graduates to enter or not enter teaching.

The researcher-developed instrument was administered via the internet-based survey provider, SurveyMonkey.com©. The content of the instrument was organized by identified factors from previous research (Foster, 2001; Harms & Knobloch, 2005; Rocca & Washburn, 2006; Swan, 2005; Warner & Washburn, 2007) and converted into a list of items related to teacher education program including the student teaching experiences and levels of influence on career decision.

To determine the instrument's face and content validity, a group of Northwest agricultural teacher educators reviewed the instrument and changes were made accordingly. The instrument was then pilot tested utilizing a group of novice teachers from California (N=26) in the same manner as was desired for the target population. Data from the pilot study were analyzed using SPSS 16.0 and produced a Cronbach's alpha of .91, establishing reliability of the instrument.

The frame of 2007 – 2008 Northwest agricultural teacher education graduates (N=33) was provided from their agricultural teacher educator in charge of student teaching. Every student was given a letter of consent confirming their desire to participate and captured their email and phone number after graduation. Of the thirty-three Northwest graduates, thirty returned their consent to participate. In early August, each of the thirty graduates was contacted via email to complete the online instrument if they had taken a position. As the graduates completed the online instrument (*N=30, n=25*), the last question requested participants identify which times and days were best for the phone interview. Both graduates who chose to (n=16) or not to go (n=9) into teaching secondary agriculture were interviewed. All graduates who completed the online instrument were interviewed, taking place between early September and mid November, as graduates were challenging to catch with their shifting and busy schedules.

Once graduates completed the online instrument, in-depth phone interviews (Burke & Miller, 2001; Creswell & Plano-Clark, 2007) were conducted to determine factors influencing their decision to teach or not to teach secondary agriculture. The interviews utilized a semi-structured interview technique (Merriam, 1998) following up on the quantitative responses, probing for clarity and rationale. All interviews were digitally recorded, transcribed, and coded in their entirety as soon after the interviews as possible (Shank, 2002). Following the guidelines set forth by Guba and Lincoln (1989), trustworthiness was established by member checks throughout the interview process confirming accuracy. Credibility was established with prolonged engagement, peer debriefing, and member checks. Transferability was established through thick description. Dependability and confirmability were confirmed through audit trails and recordings. The participants were given gender- correct pseudonyms to maintain confidentiality. It is expected that from the interviews, grounded theory will emerge (Shank).

In addition, benchmark data were collected from the lead agricultural teacher educator and/or the state program manager in the fall to confirm the number of program graduates, number of graduates who received certification, number of graduates receiving certification who entered the teaching profession, and the number of positions opened in their state for the 2008-

2009 academic school year and who filled each position, including positions that were not filled. Demographic data were also collected.

Findings

Results for objective one are as follows, for the 2007-2008 academic year, thirty-three student teachers graduated from the seven Land-Grant Universities in the Northwest (Table 1). Results for objective two are as follows, of those-thirty three graduates, three chose not to be certified to teach. Therefore, thirty graduates chose to be certified to teach secondary agriculture (Table 1). For the 2008-2009 school year, there were 102 positions available in the seven Northwest states. Nine 2007-2008 graduates did not enter secondary agriculture teaching profession during the 2008-2009 school year. Despite 27.3% of the graduates not teaching secondary agriculture, 98 positions (96.0%) were filled with alternatively certified teachers, current teachers moving, novice teachers, and teachers returning to the profession, even some who had recently retired. Despite four positions not being filled, two programs were gained in the Northwest.

Table 1

2007 - 2008 Northwest Land-Grant Institutions Agricultural Education Teaching Graduates and Secondary Positions Within Their Respective States.

Northwest Land-Grant Institutions	AgEd Teaching Graduates		Secondary Ag Ed	
	f	Certified to Teach AgEd	Positions Available	Programs gained or lost
TOTALS	33	30	102	+2

To address objective three, twenty-four of the thirty certified graduates (80%) became secondary agriculture teachers during the 2008-2009 academic school year. To address objective four, in comparing the 30 certified graduates to the 102 open positions, the current rate of agricultural education graduates per position is 3.4 positions per graduate. The graduates could have potentially filled 29.4% of the positions.

Graduates who did not go into secondary agriculture teaching were most satisfied with their students during their student-teaching experience (M = 5.00) (Table 2). Graduates who did not go into secondary agriculture teaching were somewhat satisfied with the University's preparation for job attainment (M = 4.11) (Table 2). Considering this is lowest ranked response the graduates were still somewhat satisfied, despite not teaching secondary agriculture.

Personal reasons (M = 4.78) had the most influence on the graduates' career decision and was much higher than the other responses (Table 3). The lowest response to personal reasons was much influence and most of the graduates indicated a great deal of influence. Three items had some influence which were opportunity for graduate school (M = 3.33), salary competitiveness with industry (M = 3.11), and confidence in preparation to teach (M = 3.11) (Table 3).

Table 2

Satisfaction Levels of 2007-2008 Northwest Agricultural Education Graduates Who Chose not to Enter Teaching Secondary Agriculture (N = 9).

Level of satisfaction with…	1	2	3	4	5	6	*M (SD)*
Students during Student-Teaching Experience (STE)	1	0	0	0	4	4	5.00 (*1.58*)
Community during STE	0	1	0	1	4	3	4.89 (*1.27*)
Students' parents during STE	0	1	0	2	2	4	4.89 (*1.36*)
Overall Student-Teaching Experience	1	0	1	0	2	5	4.89 (*1.76*)
Teachers across campus during STE	0	1	0	1	5	2	4.78 (*1.20*)
Cooperating Teacher during STE	1	0	1	1	1	5	4.78 (*1.79*)
Advisory Committee during STE	0	2	0	1	2	4	4.67 (*1.66*)
Teacher- Preparation Program	0	2	2	0	2	3	4.44 (*1.56*)
Administration during STE	1	1	0	0	5	2	4.44 (*1.74*)
University's Preparation for Job Attainment	1	0	2	2	2	0	4.11 (*1.62*)

Note. 1 = Extremely Dissatisfied, 2 = Very Dissatisfied, 3 = Somewhat Dissatisfied, 4 = Somewhat Satisfied, 5 = Very Satisfied, 6 = Extremely Satisfied

Table 3

Influential Level Factors on Northwest Agricultural Education Graduates' Career Decision to Not Enter Teaching Secondary Agriculture (N = 9).

Influence of...	1	2	*3*	*4*	*5*	*M* (*SD*)
Personal reasons	0	0	0	2	7	4.78 (*0.44*)
Opportunity to enter graduate school	3	0	1	1	4	3.33 (*1.87*)
Salary competitiveness with industry	2	0	3	3	1	3.11 (*1.36*)
Confidence in preparation to teach	4	0	0	1	4	3.11 (*2.03*)
Amount of resources (facilities, program funding) available	2	1	2	4	0	2.89 (*1.27*)
Commute length (place bound)	2	2	2	1	2	2.89 (*1.54*)
Effort to teach secondary agriculture	3	1	1	2	2	2.89 (*1.69*)
Community support	2	1	3	3	0	2.78 (*1.20*)
Time investment outside of class time	3	1	2	1	2	2.78 (*1.64*)
Salary not reflecting effort	2	2	3	1	1	2.67 (*1.32*)
Family support	3	1	2	2	1	2.67 (*1.50*)
Credential/certification process	3	2	1	1	2	2.67 (*1.66*)
Level of preparation	4	1	0	3	1	2.56 (*1.67*)
Professional development requirements	4	1	0	3	1	2.56 (*1.67*)
Support from colleagues	3	2	2	1	1	2.44 (*1.42*)
Support from agriculture industry	3	2	2	1	1	2.44 (*1.42*)
Administrative support	4	1	3	3	0	2.22 (*1.30*)
Discipline problems in class	6	0	1	0	2	2.11 (*1.76*)
Health related	7	1	0	1	0	1.44 (*1.01*)

Note. 1 = No Influence, 2 = A Little Influence, 3 = Some Influence, 4 = Much Influence, 5 = A Great Deal of Influence

Of the 2007-2008 Northwest agricultural teacher education graduates, 24 of the 33 (73%) were teaching secondary agriculture. One graduate left the Northwest and is teaching in a state outside of the Northwest because the spouse is pursuing a master's degree. The names represented are pseudonyms and are gender correct. Of the nine who are not teaching secondary agriculture, they are:

- Managing a farm and ranch supply store (Nicole; $n=1$).
- Serving in the Peace Corp teaching adults computer applications (John; $n=1$),
- Stay-at-home mothers (Cait & Julie; $n=2$),
- Teaching 6-12 graders in other career and technical education areas (Paul & Cassy; $n=2$),
- Teaching 6-12 graders special education including horticulture topics (Jenny; $n=1$), and
- Teaching at a post-secondary institution (Kelly & Kim; n = 2)

Despite commute length (place bound) having "some influence" (M = 2.89), when analyzing the data it emerged as a major influence on career choice. Graduates' comments provide clarity about career decision-making factor – commute length (place bound); here is a sample of comments and include:

- "I did not make that decision. I watched the job openings throughout the entire summer, the closest one to where I was living was still an hour away and my husband is still in school so we didn't really have the moving option." – Julie
- "I would have considered teaching ag if there was a position in this area. Significant other lives in the valley and his family is [here and we are] almost engaged!" - Nicole
- "If there was an opening I would take it. If my husband ever decides it's okay for us to move somewhere, as he's stuck on the huge ranch working for his grandparents so he would never leave them. But if something ever happened to them, we might move somewhere that I could get a position… I am willing to drive up to 45 minutes one way and it wouldn't be the end of the world." - Kelly
- "There are six or seven programs within 30 minutes of me, so I would be willing to travel to those, but it just depends on who is retiring, who is moving, whose class numbers are up." - Julie
- "The district I'm in has three ag programs, and range from 10 to 32 miles from the ranch, but none of them are currently available. I do have intentions to teach ag. Number one factor is unavailability of jobs in the area where I would like to live" - Jenny
- "I did get married and I am kind of stuck here. We did talk about if there was a job that I could get to within a few hours, and maybe I would have to get an apartment I would but that website isn't kept up to date so I don't really know about the openings." - Kelly

Graduates were asked "If the opportunity to teach secondary agriculture presents itself, are you interested?". Here are several responses…

- "This coming spring I plan on looking at the job board see what is really open, and if there is something that is going to work out then I will jump on it." - Julie
- "I'm waiting for an opening in the area, If there is one I will quit my other jobs and go to it." - Kelly
- "I am pretty set on being in my area as I am close to getting married, and she is still at the university which is close by." – Paul
- "I'm actually looking to go teach ASAP." – Nicole

Two graduates interviewed for local secondary agriculture teaching positions but were not hired. Kelly substitute taught for awhile at a specific school and interviewed for that school's open Ag teaching position and, " I didn't even get an interview. So I'm not subbing there anymore." Paul shared that he "applied for three ag teaching positions, in my area and was not offered an Ag teaching position." As a result, Paul accepted a career and technical education position teaching content similar to his passion of agricultural mechanics in small gas engines and construction. The high school is within the area he wanted to live in.

Two graduates indicated their personal reasons were also tied to mothering responsibilities, their quotes follow:

- "When we decided to have a family and my husband was finishing his masters, we just decided to try to make it on a budget and to keep me home for personal reasons; it's so good to be home and to take care of your own kids." – Cait
- "Just for my own personal family needs, I felt that [teaching] an hour away was just too hard, babysitter wise, gas wise, everything like that, so that was my final decision" - Julie

Graduates were asked "What would it take to get you into the secondary agriculture classroom?" and a sample of their responses included:

- "Probably once we are done having kids and they are in school. Unless circumstances happen that I need to go back to work immediately I will probably go into teaching Ag once we are done having kids and they are all in school." - Cait
- **"**I did consider it for a while. And said yeah I do want to teach high school, the only reason I would consider it is if I finally settle down with my life and I am in an area that I would really like to be in and [an agriculture teaching position opens] I think would be a really good fit for me. I'm not going to go out searching. But if it came to me and it ended up working out, maybe." - Kim
- "The motivating factor for my wife and I for choosing the Peace Corp was to give something back to our international community and mainly just the experience of living abroad, learning about a new culture, and teaching people in unconventional ways. When our two years are served, I am 100% sure at this point I will definitely come back to ag teaching." - John
- **"**If there was an ag teacher opening in this district or the district in the next county, I could drive as the far away as 45 miles. There are only two high schools here with a possible third being built and two in the next county. My husband works locally so we are not planning on moving." - Cassy
- **"**I am currently pursuing a master's degree in special education through the Land Grant University and it's a two year program. I am currently teaching special education and it fits very nicely with my masters program. The other thing is, having grown up on a local ranch and being 7^{th} generation, I plan on living here, and it is the primary motivator for my career choice at this time." – Jenny

Only one graduate, Kim, indicated she had no interest in pursuing a secondary agricultural education position. The other eight graduates had hopes of teaching secondary agriculture soon. Kim's comments were the only negative comments about the student-teaching experience.

- "Basically during my student-teaching experience I realized that my personality doesn't fit with the 9-5 in the classroom type position. I like to make my own schedule, not a schedule someone makes for me. I had huge discipline problems, I think that could have been a huge part of not going into it actually. Because I am not a mean person, it's really hard for me to discipline people so, it's hard for me to be in the high school classroom. I guess I don't know how to deal with some situations and I know that is a huge issue with high school." - Kim

There might be concern with teaching salaries not being attractive enough to draw graduates into teaching. The following comments from graduates addressed this issue:

- "Starting salary is pretty much the same (between industry position and teaching position)." - Nicole
- "Teaching fits what I want out of life with vacations, pay kinda. I'm not rolling in the money, but I'm not living under a bridge." – Paul

Implications for Action

Nearly 73% of the graduates in this study entered the secondary agriculture teaching profession. This percentage is higher than the highest percentage indicated between 1965 and 1998 of 64% (Camp, 2000). The 73% in this study is also higher than the more recently reported 70 % in 2006 (Kantrovich, 2007). Even if 100% of the 33 graduates in this study entered the profession, there would still be a shortfall. The proportion of graduates entering the profession appears to be less of a problem than graduating enough potential teachers to begin with. It would be helpful to track the enrollment numbers within these programs. If the numbers of incoming students are much higher than graduates, there is an attrition issue. If this is the case, looking carefully at what agricultural teacher preparation programs are doing is critical and warrants further research.

Within this study, nine of the thirty-three graduates were not teaching agriculture, but the majority of them are teaching, indicating their intrinsic motivation to interact with students and make a difference. Even stronger is the graduates' circumstance of being place bound. Regardless if there are many positions open in the Northwest, graduates are not in a position to or are unwilling to relocate. Because graduates are committed to significant others and are place bound, they are unwilling to take positions more than 45 miles from "home."

The theme of these graduates' current positions is teaching and/or staying involved in agriculture or a closely related field. There is definitely a shortage of graduates in the Northwest states, considering the number of openings and projected rollover of teachers. The career decision factors of graduates not attaining secondary agriculture teaching positions do not appear to be items that can be manipulated. Although it seemed that most of the positions were filled; pulling individuals out of retirement and employing alternatively certified teachers are merely temporary solutions for an issue that has yet to be resolved. Agricultural teacher education programs need more high school graduates and community college students to enroll. As a result, students need to be targeted and recruited from geographical areas that have a foreseen need or track record of need for agriculture teachers.

Several implications arise from this study, primarily the realization that placeboundness is a genuine challenge. To address this geographical need, agricultural teacher preparation programs need to encourage all secondary agriculture teachers to indicate within five years when they plan to retire so that recruiting from that area is emphasized. This indication of near retirement to the teacher preparation program should be confidential. Placing student teachers near that school could encourage student teachers to consider teaching in that area upon graduation. If the retiring teacher is in their last year, perhaps placing a willing student teacher there should possibly be encouraged, assuming that the program is suitable for such a pivotal experience.

In addition to these efforts, perhaps bonuses from local districts would provide enough incentive for a teacher not from the area to consider the move. Local school districts should also consider incentives for those qualified locals, in terms of technical content and a bachelor's degree in agriculture, are funded to return to the university for their certificate coursework.

It is theorized that graduates have a strong desire to teach secondary agriculture, but that desire is not strong enough to relocate more than 45 minutes from a teaching position if there are significant others and/or local family limiting employment options. This commitment to important people in the graduate's lives is a strong and admirable characteristic, but does not help the teacher shortage. It should be noted that the majority of the comments from these graduates regarding travel (place bound) initially looks like a challenge for females only. But both males were employed in their non-agriculture teaching positions to stay near their significant other, providing evidence that the significant other has much influence on the graduate's location of employment.

Unless something is done quickly and intentionally regarding graduating students from agriculture teacher preparation programs, then successfully filling all of our positions with highly qualified and motivated graduates, the goals set forth within the 10 x 15 initiative (Team AgEd, 2006) will not come even close to fruition. As we search to "find viable solutions"… "to increase the number of graduates who seek [secondary agriculture] teaching careers…" (Team AgEd, 2006, p. 24) it is apparent that the Northwest states have a long way to go. Further research needs to be conducted in other regions of the country to understand why graduates do not enter the teaching profession. Perhaps the findings of this study are specific only to the Northwest. This study was designed to set benchmark data for repeated use to track trends and rationale for career decision making of agriculture teacher education graduates. More research is warranted and there is much work to be done.

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Purposes, Activities, and Documentation of Early Field Experience in Agricultural Teacher Education: A National Delphi Study

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Abstract

The purpose of this Delphi study was to identify the purpose, the expected outcomes and methods of documenting preservice teacher EFE activities in agricultural teacher education programs. A Delphi technique was used to collect data via three emailed questionnaires. Data were analyzed by using mean scores and standard deviation. The expert panel was established after asking five agricultural education department chairs from Research Intensive/Doctoral-granting institutions to identify ten university faculty members they viewed as experts in the field of agricultural teacher education. From the nominated individuals, 20 teacher education educators who received the most nominations were selected and invited to participate via a personal phone call. The panel identified 16 purpose statements, 14 activities and 9 methods of documenting EFE. The results of this study will aid the profession in providing a more congruent EFE experience for preservice teachers.

Introduction/Framework

Early field experience (EFE) is a significant component of any teacher education program. An early field experience provides a young professional the first opportunity to experience a real classroom for a teacher's perspective. EFE allows a preservice teacher the opportunity to engross themselves into a classroom setting.

EFE is the foundation for teacher education programs. An EFE provides a student a true learning experience, which can take place early in a preservice training. The Association of Teacher Educators (ATE) described early field experience as a range of school experiences, which occur prior to a student teaching experience in a preservice teacher education (Guyton & Bryd, 2000). Three purposes for early field experiences were established by Kelleher, Collins and Williams (1995), and include career exploration, melding theory and practice, and developing teaching skills.

According to National Council for Accreditation of Teacher Education (2008), the purpose of an EFE is to apply skills and knowledge in various settings appropriate to the level of a student's program. An EFE allows a preservice teacher a chance to choose an appropriate teaching strategy as well to understand a students' cognitive and social background (Liston & Zeichner, 1991). Providing a quality early field experience encourages a young professional to continue in the education profession.

Early field experiences have not been widely praised by all. Critics have charged EFE as encouraging imitation and conformity (Holmes Group, 1986), foster group management orientations (Lanier & Little, 1986), and foster a status quo attitude (Clary, 1991). A major issue that comes into play for many EFE programs is the lack of purpose and expectations. Many host teachers are unsure what the college's expectations are for the students when they are sent into the field (Zeichner, 1987; McIntyre, 1983). By not having a clear purpose and coordination between early field experience teachers and college courses, a gap occurs in the goal of a teacher education preparation process. Moore (2003) suggested that many of the early field experiences are more procedural in nature, which would include time management, grading papers and classroom management. He also espoused that more focus should be placed on the material taught, how it is taught and what is learned from it.

EFE is an integral part of agricultural education for initial and advanced teacher preparation. Camp and Bailey (1999) stated "We can see that there is a long-standing and broad advocacy for and acceptance of field-based student teaching apprenticeship as of a paramount importance in agricultural teacher education," (p.62). Myers and Dyer (2004) emphasized the importance of an EFE in agricultural teacher education program because it assists students in decision making for the future.

The theoretical framework for this study of EFE is grounded in experiential learning. Mentkowski and Associates (2000) indicated experiential learning provides students with experiences, which will lead to transfer of information. The transfer of information is the starting point of a reflective educator (Mentkowski and Associates). Kolb (1984) defined experiential learning as a "means for examining and strengthening the critical linkages among education, work and personal development" (p.4). Dewey (1938) defined learning experience as "every experience both takes up something from those which have gone before and modified in some way the quality of those which come after" (p.35). Rogers (1969) espoused that experiential learning happens continuously from meaningless to significant learning. Rogers identified five elements present in experiential learning: 1) direct, personal involvement, 2) learner initiation, 3) pervasiveness, 4) learner evaluation and 5) essence is meaning. Just as experiential learning provides students with experiences an EFE will do the same for students who are interested in the agricultural education profession.

Retallick and Miller's (2005) structure and content model of early field experience represent's three major components of EFE: the foundation, organization, and implementation of EFE. The foundation of the model includes the teacher education standards and a conceptual framework, which provides a basis of how EFE can evolve. Building upon the foundation of the model is the organization of EFE. In organizing EFE, teacher education programs must develop through various experiences. The implementation stage of the model includes four elements: 1) interaction among the EFE participants, university supervisors, cooperating teachers and peers; 2) the orientation to the outcomes and learning strategies; 3) the outcomes; and 4) the learning strategies necessary to accomplish the outcomes. Although Retallick and Miller (2005) provide examples of the learning outcomes and strategies from the literature, no research has been conducted to identify the purpose, the expected outcomes and methods of documenting preservice teacher EFE activities in agricultural teacher education programs.

Purpose and Objectives

The purpose of this Delphi study was to identify the purpose, the expected outcomes and methods of documenting preservice teacher EFE activities in agricultural teacher education programs.

To achieve the purpose of study, three research objectives were developed.

1. Identify the purpose of EFE in agricultural teacher education programs.
2. Identify the activities for an EFE in agricultural teacher education.
3. Establish a list of methods for documenting EFE activities in agricultural teacher education programs.

Methods and Procedures

A Delphi survey research technique was determined to be the most appropriate method to address the purpose of this study. The Delphi technique was implemented to more accurately gather and interpret the perceptions of the population. Delp, Thesen, Motiwalla, and Seshadri (1977) described the Delphi technique as a group process to solicit, collate, and direct expert responses toward reaching consensus on a topic or issue. Helmer (1966) described the Delphi technique as a method of refining group opinions and computed consensus for a majority opinion. The technique uses sequential questionnaires developed through summarized information and feedback of opinions from earlier responses (Delbeq, Van de Ven, & Gustafson, 1975).

The selection for the panel of experts followed Jairath and Weinsten (1994) who suggested that the study participants be experts who are knowledgeable about the field of study. Five agricultural education department chairs from Research Intensive/Doctoral-granting Institutions were asked to identify ten university agricultural education faculty members who they viewed as experts in the field of agricultural teacher education. From the nominated individuals, the 20 teacher education educators who received the most nominations were selected for this study and invited via a personal phone call to participate in this national Delphi study. Dalkey (1969) stated the reliability of the study is greater than .80 when Delphi group responses numbered greater than 13.

Respondents were asked to answer three open-ended questions. The questions were used to generate an array of responses, which were categorized and grouped into logical categories (Strauss, 1987). The second questionnaire was comprised of a list of statements generated from the first questionnaire. Participants were asked to respond to each statement using a 5 point Likert-type scale. A third round were used to reach group consensus.

The Delphi study used a series of three emailed questionnaires to reach group consensus. This first round of the Delphi study used three open-ended questions, which were as follows.

1. What is the purpose of an early field experience in an agricultural teacher education program?
2. What are the activities of an early field experience in agricultural teacher education?
3. What methods should be used in documenting preservice teacher activities for EFE in agricultural teacher education programs?

The electronic questionnaire's were distributed to 20 participants through Survey-Monkey (2010) and was used to track respondents and nonrespondents. The responses to the questions were grouped into themes and served as items/statements for the second round. In the first round, question one received 96 responses regarding the purpose of EFE, which were grouped into 16 statements; question two received 90 responses regarding the activities of EFE, which were categorized into 14 statements and question three received 67 responses regarding the documentation of EFE, which were organized into 9 statements. Sixteen participants responded during round one yielding an 80% response rate.

In round two, the survey was only sent to the participants who responded to the open-ended question in round one. Participants were asked to rate each of the statements identified in the first round using a five point Likert-type scale (1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, 5 = Strongly Agree). Respondents were allowed to provide comments to clarify their responses (Trexler, Parr, & Khanna, 2006). All participants (100%) who responded in round one (n=16) completed the second round.

Data collected from round two were analyzed using standard deviation and mean scores. It was determined *a priori* that consensus was met for each statement if the mean score was greater than 3.5 and standard deviation was equal to or less than one, which indicated a strong consensus for inclusion (Trexler, Parr, & Khanna, 2006). The statements participants rated with a standard deviation of less than or equal to one were considered to have met consensus as suggested by Shinn (1998). All statements not meeting these thresholds were dropped.

In the third and final round, participants were provided with their initial ratings, group mean rating and standard deviation of statements. The participants were asked if they agreed with their initial ratings and if not to adjust their rating accordingly. All 16 participants who responded in round two also completed round three yielding a 100% response rate for round three. All data was analyzed using descriptive statistics and were reported using mean and standard deviations.

Findings

The purpose of this Delphi study was to identify the purpose, the expected outcomes and methods of documenting preservice teacher EFE activities in agricultural teacher education programs. Twenty teacher education experts as identified by five agricultural education department chairs from Research Intensive/Doctoral-granting institutions were asked to serve as the expert panel for this Delphi study. Sixteen (80%) of the experts completed all three rounds of the study.

Objective one of the study was to identify the purpose of EFE. Sixteen statements for the purpose of EFE met consensus with a range in means from 4.00 – 4.87 on a five-point Likert-type scale and standard deviations ranging from 0.34 – 0.88. As noted in Table 1, the statement practitioners most agreed with the purpose of EFE being include identify the roles of a professional educator, observe classroom instruction, affirm the desire for becoming an agricultural educator, and develop understanding of a complete Agricultural Education Program (i.e., classroom/laboratory, FFA, SAE). The panel agreed least with the purpose of EFE while still meeting consensus, as being to interact with community members, school staff and administration.

Table 1
Delphi Round Three: Responses to Purpose of EFE (n=16)

A purpose of EFE is to….	Mean	*SD*
Identify the roles of a professional educator.	4.87	0.34
Observe classroom instruction.	4.87	0.34
Affirm the desire for becoming an agricultural educator.	4.87	0.34
Develop understanding of a complete Agricultural Education Program (i.e., classroom/laboratory, FFA, SAE)	4.87	0.34
Develop understanding of what is involved in being an agricultural teacher.	4.68	0.79
Identify skill development (classroom instruction/management, program planning) of a teacher	4.56	0.51
Educate preservice teacher about what it means to learn to teach as they reflect on why, whom and how they will teach.	4.56	0.62
Recognize awareness of student engagement.	4.56	0.62
Identify cooperating teacher behavior/s that influences student behavior.	4.50	0.63
Recognize awareness of student behavior.	4.43	0.62
Have a positive experience.	4.37	0.88
Define and describe characteristics of effective teacher.	4.31	0.47
Recognize a successful classroom and laboratory management strategy.	4.31	0.79
Develop observational skills and techniques.	4.31	0.87
Recognize a successful teaching strategy.	4.18	0.75
Interact with community members, school staff and administration.	4.00	0.63

Note: Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, 5 = Strongly Agree

Objective two was to identify the activities for an EFE in agricultural education. Of the fourteen activities identified in the first round of the Delphi, eleven met consensus as EFE activities in agricultural teacher education (table 2). All activities were rated on the same five-point Likert-type scale.

As noted in Table 2, the statement practitioners most agreed with the activity of EFE is for preservice teacher observation of cooperating teacher and orientation from university faculty on the expectations of EFE. Practitioners agreed least with an activity for EFE is to review case studies in a university setting and student-led discussion by preservice teacher.

Table 2

Delphi Round Three: Responses to an Activity of EFE (n=16)

An Activity of EFE is to…..	Mean	*SD*
Preservice teacher observation of cooperating teacher.	4.93	0.25
Orientation from university faculty on the expectations of EFE.	4.81	0.40
Note taking of observations while on EFE.	4.68	0.47
Observation of student's learning by preservice teacher.	4.68	0.47
Observation of student's behavior by preservice teacher.	4.62	0.50
Develop reflection papers throughout experience (micro-reflections).	4.62	0.61
Interviewing middle/high school students, cooperating teacher, school counselor, principal, etc.	4.56	0.62
Develop written portfolio documentation of experience.	4.50	0.73
Compile list of information regarding the EFE- program visited.	4.43	1.09
Observing the supervision of students FFA projects and activities.	4.37	0.71
Observing the supervision of students SAE projects and activities.	4.31	0.70
Preservice teacher teaching a lesson.	3.62	1.25
Review case studies in a university setting.	3.56	1.20
Student-led discussion by preservice teacher.	3.56	0.89

Note: Scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, 5 = Strongly Agree

Objective three of the study was to establish a list of teaching strategies for documenting preservice teacher EFE activities. Eight of the nine statements established by the panel of experts met group consensus (table 3). The statement practitioners most agreed with how an EFE activity should be documented included journaling on EFE experience, cooperating teacher-verification signature, and preservice student completing a reflective paper on experience. Practitioners agreed least with how an EFE activity should be documented with a cooperating teacher evaluation.

Table 3
Delphi Round Three: Responses to EFE Activities Should be Documented by (n=16)

EFE activities should be documented by the….	Mean	*SD*
Journaling on EFE experience	4.75	0.44
Cooperating Teacher – verification/signature	4.68	0.47
Preservice student completing a reflective paper on experience.	4.68	0.60
University Supervisor Review of Documents	4.62	0.50
Seminar for EFE students to discuss and compare experiences as a group.	4.43	0.51
Preservice student completing an observation of the visited agricultural education program (reviewing: teaching resources, curriculum, facilities, budget, etc.).	4.31	0.60
Collection of key resources and documents.	4.31	0.70
Development of a Portfolio	4.12	0.61
Cooperating Teacher Evaluation	3.68	1.30

Note: 1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, 5 = Strongly Agree

Conclusions/Recommendations/Implications

There are several purposes of EFE. Agricultural teacher education experts in this study have identified sixteen purposes of EFE in agricultural education. These purposes are consistent with previous research conducted (Jaquith, 1995; Knowles & Cole, 1996) and recommendations made by the National Council for Accreditation of Teacher Education (NCATE). The NCATE (2008) recommends an EFE can be accomplished by providing opportunities, which could include observing, assisting cooperating teacher and tutoring students. An EFE provides the student an opportunity to begin thinking and experiencing the role of a teacher in their career field (NCATE, 2008).

Eleven activities were identified to achieve the purposes of EFE. These activities are also consistent with the activities identified by Retallick and Miller's (2005) model and Dobbins and Camp's (2003) comprehensive list of tasks for the student teaching experience. Dobbins and Camp, who surveyed agricultural education teachers and secondary school administrators, identified sixty EFE tasks that were organized into three themes. The three themes consist of time, planning and cooperation. All groups involved in Dobbins and Camp's (2003) study believed planning and cooperation should occur before EFE. As the profession looks to the future, continuous dialogue in the teacher education profession needs to occur to ensure we are enhancing the activities, which need to be part of an EFE.

The findings of this study, as established by a panel of expert who researched consensus, indicate the means by which EFE should be documented includes a combination of journaling and portfolio development. The verification of these documents should be completed by the cooperating teacher and through university evaluations. All of the activities conducted during an EFE should be documented in some manner because the documenting or journaling experience provides EFE students the opportunity to reflect on their experiences as they continue through their teacher preparation program.

Documentation of an EFE experience can be done through journaling, a cooperating teacher signature, reflective paper or a review of collective documents. All EFE experiences need to be documented so the student is able to reflect and grow from the experience. No matter what form of documentation is used it must be an appropriate method for the experience. Depending on the goal of the experience the form of documenting the experience will vary. Every EFE experience is different and needs to be a building experience prior to entering the teaching profession.

Retallick and Miller's (2005) structure and content model of early field experience represent's three major components of EFE: the foundation, organization, and implementation of EFE. The findings from this study can be incorporated into the implementation stage of this model. The implementation stage of the model includes: 1) interaction among the EFE participants, university supervisors, cooperating teachers and peers, and 2) the orientation to the outcomes and learning strategies. This study conforms with the model and will add to the depth and substance of EFE research by defining the purpose, activities and various documentation methods.

This study has implications for agricultural teacher education programs that are planning to evaluate their current programs or preparing to revamp their EFE programs. The results of this study can be used to modify, clarify, and improve the EFE experience by clarifying the purpose, activities and ways of documented activities in agricultural teacher education programs. By having consistency among all programs it provides a more educative experience for all students involved in an EFE, which assists in accomplishing the goals of EFE. It is recommended that agricultural teacher education programs adopt the list of activities and method for documenting EFE.

The findings of this study provides teacher educators who coordinate early field experience a list of purposes, activities, and methods for documenting EFE, which had been agreed upon by a panel of experts within the field of agricultural teacher educators. The results of this study may be used by all EFE coordinators to ensure the purpose; activities and ways of documenting are being implemented in their programs and the highest level of EFE experience is provided.

Further research is needed to determine how often EFE is being evaluated for agricultural teacher education programs. Little information is known about who (if anyone) is reviewing the EFE programs, whether or not reviews are necessary, how program recommendations are handled and how EFE changes are implemented/incorporated into individual agricultural teacher education programs.

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Pre Service Teachers' Perceptions of Academic Integration within the Agricultural Science Classroom

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Abstract

Academics, particularly science, have always been an integral part of the agricultural education curriculum and core subject academic integration within agriculture has been steadily researched since the mid 1980's. Teachers of agriculture are currently being called upon to more frequently integrate core subject concepts into the agricultural curriculum. The purpose of this study is to determine pre service teachers' perceptions integrating science, technology, engineering and math into an agricultural education curriculum. The study was qualitative in design and consisted of two focus groups. The population (N=14) for this study were all agricultural science pre service teachers that were preparing to complete their student teaching internship in the Fall of 2009 at a southern university. The researcher analyzed the study data using the constant comparative method described by Glaser and Strauss (1967) that employed unitizing and categorizing of the data. Peer reviews and member checks were conducted to establish trustworthiness and confirmability. Results of the findings are as follows: 1) Pre service teachers stated that academic integration brings two subjects together by taking an outside subject and integrating it into your curriculum to show relevance and a connection between the two. 2) Relationships with core subject teachers, textbooks from core subject classes, and access to computer technology are tools that are needed to perform academic integration. 3) Personal attitudes and time to prepare lessons that integrate core subject concepts are viewed as barriers to academic integration. 4) Science, mathematics, and English are easily incorporated into agricultural science classes, but the level at which they are incorporated depends on the core subject competence of the agricultural science teacher. 5) Pre service teachers do not feel prepared to integrate academics into their classroom because their undergraduate coursework does not include courses that teach them how to integrate academics into the agricultural science curriculum. Future studies are planned to determine current agricultural science teachers' perceptions on core subject integration into their curriculum.

Introduction

Academic integration within agriculture has been at the fore front of literature and research since the mid 1980's (Budke, 1991; Fraze, 1993; Malpiedi, 1989; Trexler & Barrett, 1992; Vaughn, 1993) with the realization that academics, particularly science, has always been an integral part of the agricultural education curriculum (Budke, 1991; Hillison, 1996; Thompson & Blaschweid, 2000; Vaughn). According to The National Academy of Science's 1988 report *Understanding Agriculture: New Directions for Education* (p. 57):

> *Farmers were independent business people and entrepreneurs who made and acted upon many decisions intelligently, farmers needed to know much more than practical skills, such as plowing and planting. They needed analytical problem-solving skills to decide what to produce; how to use available land, labor, and other resources; and how to overcome adversity. They also need to understand and apply [scientific knowledge] and experimental methods, financial analyses, and sound business practices.*

The integration of science education into agricultural education has a long history. Some of the earliest history of science education in agricultural education is evident by the passing of The Hatch Act of 1887 which established Agricultural Experiment stations. These entities were very focused on the importance of both science and research in agriculture (Brister & Swortzel, 2007). At this time, instructors of agriculture courses in both the secondary and post-secondary institutions were expected to both include science curriculum in their courses and to have a strong background in science themselves (Brister & Swortzel). The Smith-Hughes Act of 1917 emphasized vocational objectives in agricultural education, and the science objectives consequently received less emphasis (Brister & Swortzel). Even today, many people think of agricultural science courses as strictly vocational courses despite the fact that "agriculture now so thoroughly combines basic and applied aspects of the traditional Science, Technology, Engineering, and Mathematics (STEM) disciplines" (NRCNA, 2009, p. 4).

With the development of Public Law 107-110: The No Child Left Behind Act of 2001 and the changes in the state graduation requirements (*Recommended Requirements*: *four mathematics credits, four science credits, and one technology applications credit)* the pressure for agricultural educators to place more emphasis on the science, technology, engineering and mathematics has increased greatly (Brister & Swortzel, 2007). According to Myers, Washburn and Dyer (2004, p. 44), "Teachers of agriculture in the secondary schools are being called upon to integrate curriculum that addresses standards in science, mathematics, and other content areas." Both academic and career and technical educators view the integration of academic and applied concepts as a means of meeting the recommendations of the American Association for the Advancement of Sciences. The American Association for Advancement of Sciences recommend that curricula should connect "…what students learn in school through interdisciplinary links, real world connections, and connections to the world of work" to more effectively prepare students to enter into the workforce (Balschweid, Thompson, & Cole, 2000; Thompson, 2001).

Although the vocational aspects of agricultural education courses and other career and technical education (CTE) courses continue to be important, current trends have begun to revert back to the inclusion and emphasis of STEM concepts in CTE courses. According to the state education agency, CTE no longer focuses solely on preparing students to enter the world of work immediately after high school graduation. To teach many agricultural education concepts, agricultural education teachers are required to utilize core science and math concepts. The utilization of STEM concepts to teach agricultural education courses provides an opportunity for agricultural education students to experience examples of real-world applications of STEM concepts and gain relevant, hands-on experience. The applied knowledge gained through agricultural education courses serves to increase conceptual understanding of the science and math concepts as well as hold student interest. Because the emphasis in many schools is success on state standardized assessments, agricultural education programs must do what they can to increase science and math scores in order for the courses to remain viable options for students. According to the state education agency being enrolled in any CTE had a small, negative impact on state standardized assessment scores. These findings suggest the need for increased cross-training with academic instructors so that CTE teachers can improve their core academic instruction, especially during the early high school years. In other states, research has shown that CTE (agricultural science) courses are an effective method to teach science and math concepts (Warnick & Thompson, 2004). Some schools have cut these programs, despite their benefit to students.

Secondary students in the United States already lag behind their peers in other countries in terms of science and math literacy and lack the skills necessary for today's high-skill workplaces or to meet college entrance requirements (Stone, Alfed, Pearson, Lewis & Jensen, 2007). According to the United States Department of Education and the National Center for Educational Statistics (2009), 15 year old United States students were out performed, in terms of average scores based on the Organization for Economic Cooperation and Development (OECD) mathematics literacy assessment by their peers in 23 other countries. Additionally, United States' students were also outperformed in the sciences, in terms of average scores based on the OECD science literacy assessment, by peers in 16 other countries (USDE/NCES). Limiting students' paths to learn science and math will only increase the gap between the students in the United States and the students in other countries.

Currently, in the United States a number of states allow students in high school to earn science and/or math credit towards graduation by taking certain agricultural education courses. The state where this study was conducted is not one of these states. Students are currently required to take two formal science courses and three formal mathematics courses to graduate under the minimum plan and four science courses and four mathematics courses are required to graduate under the recommended or distinguished plan.

Students enrolled in CTE programs tend to avoid formalized science and math classes and elect to enroll in more applied STEM type courses if given the choice (Plank, 2001). As a result, students who lack interest in traditional science and math courses are at a disadvantage when state assessments are given. This enrollment choice extends in some cases from the students' lack of desire to pursue a four-year degree. If a four-year college degree is not in a student's future, then they view academic courses that are disconnected from agricultural education as irrelevant and frustrating (Plank). According to the United States Department of Education, Office of Vocational and Adult Education, more than 15 million students were enrolled in CTE

Programs in the 2006-2007 academic year (see Figure 1.0), which is the highest enrollment since the 1999-2000 academic school year. Over half (63.7%, over 9.9 million students) of the students enrolled in CTE are enrolled in a secondary CTE program. Granted agricultural education only comprises a portion of these students, all CTE programs can benefit from academic integration.

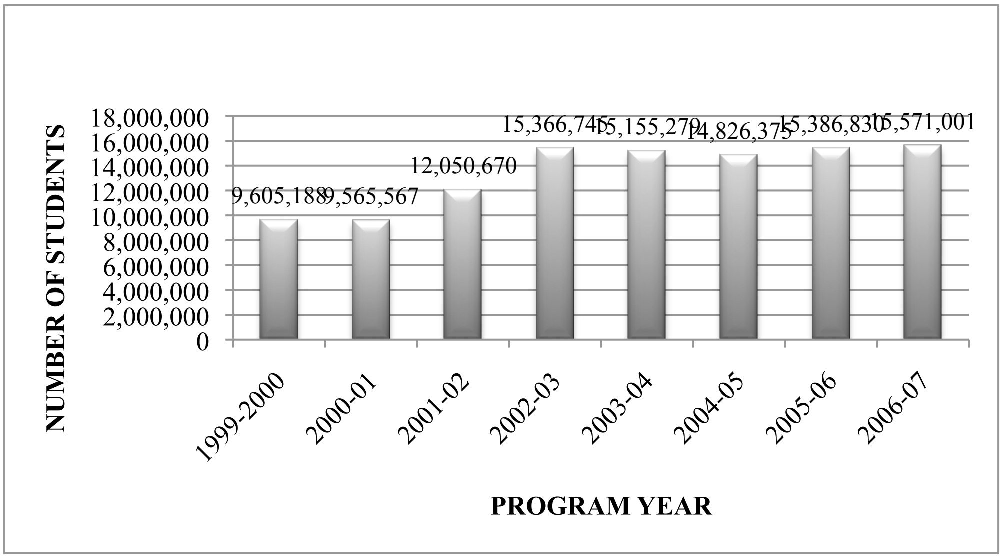

Figure 1.0 Student Enrollment in Career and Technical Education Programs, PY 1999-2007
Source: U. S. Department of Education, Office of Vocational and Adult Education, Consolidated Annual Performance, Accountability, and Financial Status Report for the State Basic Grant and Tech Prep Grant Programs under the Carl D. Perkins Vocational and Technical Education Act of 1998, FY 2006–07 (OMB Number 1830-0503).

According to the state education agency, students in CTE programs, who take at least three CTE courses, made up 29.6% of graduating students in the state in 2007-2008, a group of nearly 400,000 students. Findings on CTE's impact on graduation rates are encouraging. CTE students are more likely to remain in school and graduate than non-CTE students. This difference grows as the structure of the CTE program increases as well. To help assure that the opportunity to learn significant STEM content is available to those students, coupling STEM concepts with the CTE concepts, such as those taught in the agricultural education classroom, adds rigor to the CTE classroom and provides relevance for science concepts. By increasing the STEM content of these courses, we can bring significant STEM knowledge to a third of the state's high school students, who may normally not get this opportunity.

Current agricultural education curriculum fails to effectively integrate STEM into the lessons. Lesson planning and curriculum design require many hours of labor intensive work to insure that the content taught aligns with state standards, that dynamic and effective pedagogy is employed, and that the content is relevant to the students' lives. Teachers have various responsibilities other than classroom teaching and lack the additional time needed to research and effectively integrate

STEM concepts. Most teachers are required to perform ‘other duties as assigned’ which limits their lesson preparation time. Additionally, traditional CTE preparation and continued development does not include time for the integration of STEM content within the agricultural education curricula in the state. Other states have included more integration of STEM content into their agricultural education courses, with some success from this integration. Many of these states also allow science and/or math graduation credit for agricultural education courses. The study by Chiasson and Burnett (2001) showed that agricultural education students scored as high as or higher than non-agricultural education students in four out of five domains on their state graduation assessment. Also, the agricultural education students were more likely to pass the state standardized science assessments. Chemistry was the only domain where agricultural science students did not outscore their non-agricultural science classmates (Chiasson & Burnett).

Principals and other administrators positively recognize that science integration within the agricultural science curricula is beneficial to the students and assists them in understanding not only the agricultural context, but also the background information for the science principle (Myers & Thompson, 2008; Thompson, 2001). According to previous research “students taught by integrating agriculture and scientific principles demonstrated higher achievement than did students taught by traditional approaches” (Balschweid et al., 2000, p. 37). Because teachers of agriculture education are being called upon to integrate science, mathematics and other content areas into their curricula, current teachers feel that teacher preparation programs should provide instruction at the pre service level on how to integrate science and other content areas into the agricultural education curriculum (Balschweid & Thompson, 2002; Balschweid et al., 2000; Layfield, Minor, & Waldvogel, 2001; Myers & Thompson; Myers et al., 2004). Pre service teachers that received instruction on integrating science into the agriculture curriculum and in methods of collaboration with science teachers had an increased confidence in their perceived abilities to integrate science into their curriculum (Balschweid et al., 2000).

As noted by Norris and Briers (1989) if teachers respond positively to the concept of integrating core content areas into their curriculum the likelihood of teachers integrating those core content areas increases. The theory of planned behavior will serve as the grand theoretical/conceptual framework for the study. The theory of planned behavior, as proposed by Ajzen (1991, p.182), states that a persons’ attitude toward a behavior and their perceived behavioral control affects their intention to and implementation of the behavior (see Figure 2.0).

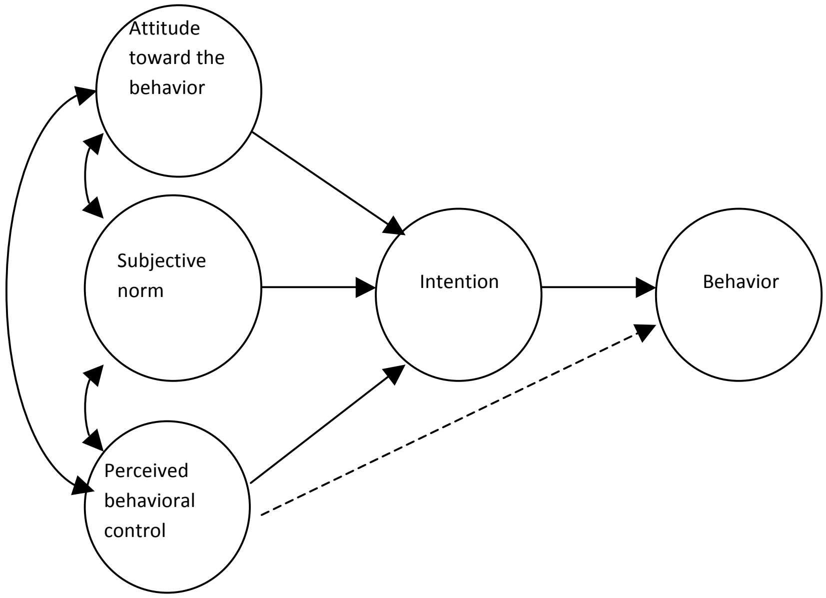

Figure 2.0. Theory of planned behavior

Teachers of agriculture feel that there are many barriers that are hindering the increase of integration of core subjects such as science and math. One of the most prominent barriers that teachers believe are hindering the increase in integration are the lack of core subject competence among teachers in agricultural education and the lack of integrated curriculum (Balschweid & Thompson, 2002; Thompson & Balschweid, 2000).

Core subjects such as science and math play a large role in the agricultural industry (Vaughn, 1993). Overall agricultural educators possess a positive attitude toward science and math integration within their curricula and recommend that teacher prep programs offer professional development workshops focused on integration methods and techniques (Myers & Thompson, 2008). Current agricultural educators also believe that teacher prep programs should incorporate instruction that focuses on math, science and reading integration into their pre service teacher programs to better prepare pre service teachers to do academic integration (Balschweid & Thompson, 2002; Balschweid et al., 2000; Layfield et al., 2001; Myers & Thompson; Myers et al., 2004).

Purpose and Objectives

The purpose of this study was to explore pre service teachers' perceptions in regards to integrating science, technology, engineering and math into an agricultural education curriculum. The following research questions were used:

1. How do pre service teachers' define academic integration?

2. How do pre service teachers feel that academic integration benefits students enrolled in agriculture education?
3. Which core subject do you feel that you can integrate strongly into the agricultural education classroom?
4. What “tools” do pre service teachers need to regularly integrate academics into the agricultural education curriculum?
5. What barriers are present when attempting to integrate core content into the agricultural education curriculum?
6. What do pre service teachers’ believe should be incorporated into their undergraduate coursework to better prepare them to integrate core content areas?

Methodology

This study was phenomenological in nature. Phenomenological studies focus on experiences and how those experiences are transformed into consciousness (Merriam, 2009). The purposive sample (N=14) for this study were all agricultural science pre service teachers that were preparing to begin their student teaching internship in the Fall of 2009 at a university in the state. Purposive sampling was utilized to “learn a great deal about issues of central importance to the purpose” (Merriam, p. 77). Participants were selected based on the following selection criterion: 1) Are they agricultural science majors? 2) Are they pursuing teacher certification? and 3) Are they enrolled in the student teaching experience during the current semester? Two focus group sessions were conducted to collect data. A moderator was enlisted to facilitate the focus group sessions and responses were recorded and transcribed by the researcher. When using focus groups, confidentiality must be ensured in the reporting of results, thus responses were coded as FG 1 or FG 2 to denote the setting of data collection but not individual identifiers. Member checks were conducted through the distribution of the transcribed data to the focus groups participants, with a request of confirmation of the information provided.

The researcher analyzed the data using the constant comparative method described by Glaser and Strauss (1967) that employed unitizing and categorizing of the data. The constant comparative method allowed the researcher to repeatedly compare the responses with previous responses in an attempt to discover new relationships (Dye, Schatz, Rosenberg, & Coleman, 2000). Following the unitizing of the data, the data were coded and the codes were included in the results section, in parenthesis after the quotations, as part of an audit trail to ensure confirmability (Erlandson, Harris, Skipper & Allen, 1993).

The units of data were sorted into emergent categories of ideas and category titles were developed to distinguish each category from the others (Erlandson et al., 1993). Continual revision, modification, and amendment were used until all units were placed into an appropriate category. Two professionals familiar with agricultural education and academic integration served as peer debriefers and confirmed category creation and compilation. The resulting emergent themes/categories were then reported and conclusions and implications were drawn based on the results. The results of this study are reported with rich description using the voice of focus group participants. The researcher kept a methodological and reflexive journal to track the details and nuances of the study as it emerged and to catalogue the researchers reflections including bias..

Findings

The findings are arranged in the order of the research questions. Emergent themes are underlined in the text body.

Before academic integration can be done, pre service teachers must be able to explain the purpose of academic integration. When asked to define academic integration the pre service teachers stated that academic integration "brings two subjects together" (FG 2) by "taking an outside subject and integrating it into your curriculum and studies" (FG 2) to "show relevance and a connection between the two" (FG 2) thus "…enhancing the learning process" (FG 2). Academic integration "incorporates core curriculum classes" (FG 1) and "gives [students] a chance to apply something they have learned in one class or another…" (FG 1) "…Through repetition [students] can master the skill, regardless of whether it is a math, science, or English skill" (FG 1).

According to the definition proposed by the pre service teachers academic integration is designed to add rigor to the agricultural science classroom and add relevance to core curriculum concepts. When asked how academic integration benefits students enrolled in agricultural sciences, the pre service teachers stated that academic integration "…shows [the students] how they can use what they are learning in their core classes…" and "…apply it to real life situations..." (FG 1). As an agricultural science teacher "you can show [the students] how to use the [core curriculum concept] in the shop…" and then [the CTE concept] "…gives more value to the [core curriculum concept] and [the students] might pay attention more in their core classes" (FG 2). According to one pre service teacher, they are "terrible with math, but if you give [them] an application for it, like in agricultural mechanics example or something like that, [they] can at least attempt to figure it out" (FG 2). Academic integration "makes students think outside the box, like when they are working on their wood working projects and they realize that they really should have paid attention in geometry because they do not know how to do these angles…" (FG 2). Academic integration not only benefits the student through "…repetition and application" it also benefits the agricultural program as a whole because it "…insures [the department's] safety of staying around" (FG 2). If schools start cutting funds "…a lot of times, the first thing to go is the agricultural program or the career and technology program" (FG 2). "…If we show [the administration] that [the agricultural department] is able to help the overall school community by integrating other things into our classroom, [the administration] will less likely make us hit the road" (FG 2).

According to the pre service teachers "any core classes can be integrated into agriculture" (FG 2) but "it would depend on the curriculum I am teaching" (FG 2). When asked which core subject;

science, technology, engineering, mathematics, or language arts do you feel you can strongly integrate into your agricultural science curriculum the responses differed from one pre service teacher to the next. Math was a common subject mentioned because "…it applies to most everything you do. Floral design you have to add the prices of the flowers, you need to have a budget; for animal science you have to know the weight of your cattle and how much you might get for your steer per pound. If you cannot add those simple numbers nor do those basic things, then you are going to have a lot of problems" (FG 2). Math was also chosen by some "…because that is what [they] feel most comfortable with. If [they] had to do integration, [they] would pick math. [They] do not feel comfortable doing English" (FG 2).

According to one pre service teacher, "Language arts is kind of scary. The only reason it is, is because we are not English teachers. We do not want to teach them wrong…" (FG 1). Even though language arts may be scary to some, "English is right up there too with math, because a lot of the tests that we make are [formatted similar to the state standardized tests], which means you are including writing in there somewhere so they have to be able to write and spell. Hopefully anytime you call on a student you ask them to use proper grammar" (FG 2).

A few pre service teachers believe that science will be the easiest core subject for them to integrate. "I am going to have to go with science being the easiest; animal science, plant science, horticulture, even in metal shop you can integrate science into each one of those (FG 2). "Science is broad enough where you could find a subject on pretty much anything and find a way to incorporate it" (FG 1). For example teaching lessons about "…plants, animal sciences, any horticulture class, even ag mechanics with all the chemicals" (FG 1) involve science concepts. "…I have a real knack for [science] and I have a strong background with a lot of science classes, and it just comes easy" (FG 1).

Technology was also mentioned as a subject that can be easily integrated into the agricultural science curriculum. Technology is important "…because it is in everything and even teachers have to learn about new technology" (FG 2). "We are always on computers and we are always working with new stuff. I think computers and agricultural applications go together. I never realized how extensive it is, just all machinery and all the different stuff you can get, it is all computerized now and technology is one of the easiest ones if you do a little research and a little preparation on it" (FG 2). For example if you were teaching an agricultural communications course "…you are going to be teaching more along the lines of computers and technology, because in communications, you have run digital cameras and you have to be able to use the computer to type your articles" (FG 2).

After describing the core subjects that they believed that they could integrate, the pre service teachers were asked to describe the tools that they would need to regularly integrate academics into their agricultural science curriculum. Collaboration with core subject teachers surfaced as a common theme among both focus groups, "it is all about relationships and who you know" (FG 1). "…Strong resources from within the school, like strong teachers, who can help you with subjects you are not sure on" (FG 1) would be a very useful tool "…Because I do not know everything a science teacher needs to teach. But if I could take a couple of lessons from the science teacher, get that science teacher to tell me some of the areas that these kids are having trouble with in his class, I think I could find a way to relate that to my subject. I think [the science teacher] and I could go back and forth, thus helping again with the cooperation part of the teachers" (FG 1). "It is a joint thing…if I have other teachers to support me then I am going to be more willing to do what I can for them, because they support me, my class, and my curriculum…" (FG 2). Therefore, "if [core teachers] can help me and sit down with me and say, do it like this" then there is less chance of "…teaching [the students] a different way…" and "…throwing [the students] off in your class or their core class" (FG 2).

<u>Resources such as textbooks and materials</u> from training workshops were another tool to assist in academic integration. "Textbooks from all the other classes" (FG 2) would also assist in making the connection between the agricultural science classroom and the core subject classroom. In addition, proper training on "…how to integrate math" (FG 1) and other core subjects would be very useful and needed. Proper training could be in the form of "…continuing education courses…" (FG 1) and "workshops, like the ag teachers conference…" (FG 1).

<u>Access to computers</u> was also a common theme within the pre service teachers' responses. "…If you are going to integrate technology somehow, computers are always the easiest way to go and that is what people need to comfortable with" (FG 2). For example, "if [the students] are building a trailer they can use Computer Aided Drafting (CAD)" (FG 2) instead of just sketching the project by hand.

After describing the tools that would be needed to integrate academics into their classroom, the pre service teachers were asked to describe the barriers that they feel hinder their abilities to integrate academics into their agricultural science curriculum. <u>Personal weaknesses</u> and <u>bad attitudes</u> were identified as barriers that hinder integration. For example, "I am not good at math. I want to integrate [math], but I know it is going to be hard for me because I am horrible at it. I am going to have to teach it to myself before I can teach [the students]" (FG 2). "I am honestly kind of nervous about trying to teach them about [core subjects], because I am afraid that I am going to screw them up" (FG 2). "My biggest fear is that the students will not accept academic integration, because if you are sitting there trying to teach them math, they are not going to want to learn it again, because they just learned it in math class" (FG 2). Teacher attitudes towards academic integration also hinder the ability to integrate. Some agricultural teachers may have the attitude that "…we do not want to do [academic integration]" (FG 1). Also, core subject "teachers may have bad attitudes towards agriculture in general, because [agricultural science teachers] have students missing days for stock shows and for different competitions and that really rubs a lot of [core subject] teachers the wrong way. If you could get in there early and change [core subject teachers] perceptions of what we do in our agricultural classes and how this…helps [students] later in life…and it is not just something that they get out of class for, I think this would help a lot" (FG 1). "…Integration would help change the core curriculum teachers' attitudes as well, because they will see that you are willing…" to integrate and teach the students how to apply the core concepts and that "…you are not just a dumb agricultural science teacher…" (FG 1).

It was evident from respondents that all these methods take time to implement. "Time is a big issue for everyone, especially agricultural science teachers" (FG 1). "…It is going to take <u>extra time</u> to prepare yourself for the lesson that you are going to integrate" (FG 1). "…It is a matter of making time and making [integration planning] a part of your routine…you already do [academic integration] without knowing it" (FG 1). Academic integration possesses "…a lot of extra work to go through and do it…" (FG 1) thoroughly. "The barrier is <u>yourself</u>. Do I really want to put that much extra effort into finding better ways to be creative about putting all that stuff into the lesson?" (FG 1). "I am a stickler for things being perfect and right, and if I cannot do it perfect, then I do not want to teach it, because I do not want to screw somebody up for life. You tell [the students] one wrong thing and that is the one thing they remember" (FG 1).

Because the pre service teachers had reservations about academic integration, the researcher asked the focus groups how their undergraduate coursework either prepared them to integrate academics into the agricultural science classroom or what could have been done in their undergraduate course work to better prepare them to integrate academics into the agricultural science curriculum. Pre service teachers indicated that <u>coursework that focuses on the integration of academics</u> within agricultural science should be incorporated into the undergraduate curriculum, for instance "…a teaching math for agriculture class" (FG 1). According to the pre service teachers, "If we are expected to integrate there should be a point where we are taught about how to integrate…" so that we know which core subject concepts "…will go good with [agriculture concepts] …" otherwise we will be "…searching aimlessly on the internet for hours" (FG 1). If the pre service teachers are not taught how to link core subjects to agriculture concepts then they "…have to look through so many [state standards/benchmarks]…" because they "…have no clue what course it should be under for science and math" (FG 1).

The pre service teachers believe that if they were informed about academic integration early on in their undergraduate coursework then they would be more cognizant of where academics are utilized within agriculture as they work through their undergraduate coursework. According to the pre service teachers, "When you are taking those core classes…you need to understand how you can integrate this [core curriculum] into your ag teaching…if I would have known about STEM integration what it was and how I am going to use it, I may have been able to retain information better and figure out different ways I could apply it to [agriculture]…if I would have seen it before [my junior year] I may have been able to figure out ways to take those core classes" (FG 2) that would assist with increasing rigor within the agricultural classroom.

Pre service teachers indicated that the teacher educators should, "<u>make a guide for STEM integration</u>" (FG 1). Furthermore they believe that making "…a guideline of the topics….like different topics you would cover in a 101 class and out beside it, different concepts in science, technology, math, English that correlates with the materials so that you have a reference point and then you can build on that more if you want," (FG 1) would help them integrate STEM more often.

Conclusions/Recommendations/Impact on Profession

The results of this research study indicate that more emphasis needs to be placed on educating pre service teachers and new agricultural science teachers how to integrate academics into the agricultural science curriculum.

Pre service teachers have a strong understanding of the concept behind academic integration and the benefits academic integration has for agricultural science students. Pre service teachers understand that agricultural education courses serve as a venue for applied science and math to take place and are cognizant of the idea that academic integration within their classrooms can assist students on the state required standardized assessments and therefore serves as leverage for program longevity within the school district. Science, mathematics, and English are viewed as the easiest core subjects to integrate into the agricultural science curriculum. Pre service teachers believe that these three subjects are utilized regularly to teach agricultural science concepts.

According to the theory of planned behavior (Ajzen, 1991) a person's perceived behavioral control affects their intentions, thus affecting the behavior. Unfortunately, a few pre service teachers doubt their abilities to integrate core subjects because they fear that their competence within these subjects are lacking and that they cannot thoroughly teach the students about the core subject concepts, in turn having an adverse affect on the students education. Thus, core subject teacher support and collaboration among teachers would assist with the integration of academics in the agricultural science classroom. Strong resources within the school and teaching communities would serve as helpful tools when integrating academics. If agricultural science teachers have the support of the core subject teachers then academic integration can more regularly take place in the agricultural science classroom. Without core subject teacher support, there is less chance of agricultural science teacher being willing to integrate academics. In addition, textbooks from core curriculum courses and the availability of technology, such as computers also would assist with academic integration in the agricultural science classroom.

In addition to a person's perceived behavioral control, within the theory of planned behavior, attitude toward the behavior also affects intentions. Personal attitudes of the agricultural science teachers and the core subject teachers, towards academic integration and the lack of time to prepare lessons that include academic integration are barriers that hinder academic integration in the agricultural science classroom.

The participants in this study do not fully understand how to effectively integrate core subject concepts into the agricultural science curriculum. Pre service teacher curricula within agricultural science should include a required course that teaches pre service teachers how to integrate STEM into the agricultural science curricula. The new required course should be taken early on in their college career, freshman or sophomore year; because being informed early in their college career would allow pre service teachers to identify, to a higher degree, how science and math accompany agricultural concepts such as those learned in their animal science courses. STEM integration guides should be created that link STEM concepts to the agricultural concepts taught. These guides would allow teachers to spend less time preparing lesson plans that integrate STEM. The creation of STEM integration guides would encourage the increase of rigor within the agricultural classroom and assist STEM teachers in adding relevance to their classroom as well.

Based upon the results and conclusions of this study it is recommended that agricultural education teacher educators should review the undergraduate requirements for certification and develop academic integration courses to better prepare pre service teachers. Another recommendation would be to include academic integration professional development workshops should be conducted at agricultural teacher conferences. Further research should be conducted to determine what current agricultural science teachers need to assist them with the integration of STEM in their classroom.

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Determinants of Concern Levels of Multiculturalism Among Secondary Preservice Teachers

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Abstract

Cultural diversity in secondary and postsecondary agricultural education programs is lagging behind recent demographic shifts in the general population. An examination of literature provides many inquiries into the need for teaching of multicultural awareness and reducing the achievement gap between students of various cultures. This research sought to summarize the current concern level that secondary level preservice teachers have toward teaching students of various cultures. Concern was calculated based upon the summation of four concern constructs: familial/group knowledge, strategies and techniques, cross-cultural competencies, and school bureaucracy. Results of this study indicate that preservice teachers' sex, home residency, and academic major play a role in the overall concern displayed. Secondary agricultural education preservice teachers are not as concerned as secondary preservice teachers from other disciplines toward teaching multicultural students. Recommendations, implications, and conclusions were developed based on the result from this study.

Introduction

The population of the United States continues to grow and expand more diverse in cultures (Census, 2006). In 2000, the United States Census Bureau issued a report detailing population numbers by ethnicity for 1980, 2000, and predicted values in 2020. The data reported the White population to be the only race to decline over the 40-year time-period. Identified with the largest increase in population growth within the United States is the Hispanic population with an 11.5% difference; followed by Asian (3.5%) and African-American (1.3%) populations.

Although the population of the United States continues to diversify, the same diversity trend is not observed among teachers within US schools. In 2009, 6.9% of the total public school teacher population was African American while African American students constituted 15.7% of the total enrollment in public schools (Coopersmith, 2009; Keigher, 2009). Similar discrepancies are observed for other racial populations. These discrepancies are further amplified by the statistic that approximately 40% of all schools in the United States do not have a single teacher of color (National Education Association, 2002). In the nation's largest urban public school systems (e.g. Chicago, Memphis, Atlanta, Milwaukee), 69% of the student population is of color represented by only 35% of teachers that are of color (NCES, 2003).

Although race is an identifiable facet of culture, it is not the only identifier. In fact, culture is explained as the explicit statement of aspects such as the learned, socially shared, and variable nature of one's experiences (Betancourt & López, 1993). Rohner (1984) proposed that culture represents design and ways of life and that each are transmitted from one generation to another. With these thoughts in mind, one could include economic status as a cultural element in a student population. The National Center for Education Statistics (2006) reports that 41.6% of the US's school-based student population qualifies for free or reduced price lunch.

Large gaps exist in the ethnic demographics of teachers and students in agricultural education, including the industry's two largest states, California (Trexler et al., 2004) and Texas (Talbert and Larke, 1995). In addition to the lack of diversity in agriculture education and the major shift in the American culture, fair warning has been issued to the profession. Bowen (2002) reported that within this cultural shift comes a fundamental challenge: either aggressively pursue methods to draw a diverse pool of new teachers into the discipline, or remain a course of study with teachers whose ranks are not reflective of the students they teach.

Throughout the agricultural education profession, presumptions can be made about preservice agricultural education majors based upon former research (Rocca & Washburn, 2006; Camp, Broyles, & Skelton, 2002; Joerger & Boettcher, 2000). Roberts and Dyer (2004) developed 40 characteristics to describe the effective agriculture teacher. In the characteristics, none of the 40 represented a cultural competent teacher or an effective teaching for all populations. Connors and Elliott (1995) concluded that although students enrolled in agriculture science classes did as well on state science examinations as students not enrolled in agriculture science; however, no increase was apparent with students from low socio-economic backgrounds. The outcome raises questions if preservice agricultural education teachers are concerned, aware, or even preparing to teach students who are culturally different then themselves (i.e. ethnicity, SES, ability, etc).

Agricultural educators need to be alarmed about the level of concern that a preservice teacher has in teaching culturally diverse populations. Spanierman et al. (2008) indicated that many students are arriving at racially diverse college settings, from mostly homogeneous White high schools, with little knowledge of or experience with people from diverse ethnic backgrounds. This should bring concern to teachers as they prepare students for a future beyond high school. In fact, Wehlage and Rutter (1986) attributed the student dropout rate to teacher concern levels. Fritz and Miller may have revealed a key contribution to the agricultural education profession in a 2003 study. They concluded that one in four female, preservice teachers had concerns for self-adequacy, described primarily as survival concerns, in their teaching impact. Although valuable, these studies did not identify a level of concern among preservice teachers toward teaching a classroom of diverse cultures.

Conceptual/Theoretical Framework

The conceptual model is derived from Fuller, Parsons, and Watkins (1973). Francis Fuller, a clinical psychologist, developed a two-stage teaching concern model for the concerns of self and pupil (Fuller, 1969). Fuller's research focus was on stages of concern in preservice teachers and beginning teachers. Fuller identified numerous categories in teaching concern, then grouped the specific categories into three stages: self-concerns, task concerns, and impact concerns (Fuller, Parsons, Watkins, 1973).

Self-concerns relate to the teachers' own worries about their ability to adequately perform and survive in the school environment (Marshall, 1996). Task concern regards daily teaching duties that pertain to the teaching methods and performance of the teacher. The final level of concern, impact, describes the teacher's apprehension toward the outcomes of the students learning needs (Srivastava, 2007).

Researche described the cultural elements of race and class by how teachers interact with students of a different race and class (Junor Clarke & Thomas, 2009; Kozol, 1992; Dusek & Joseph, 1985). In addition, research within the education profession has described how teachers' concerns relate to what approaches they take in the delivery of content to students. Included in the literature are various areas of teaching concerns in preservice science education (Gunstone, Slattery, Baird, & Northfield, 1993), horticulture teachers exploring mathematics enhancement (Jansen, Enochs, & Thompson, 2006), individuals teaching or not teaching five years after graduation (Marso & Pigge, 1995), and mathematics education teachers (Christou, Eliophotou-Menon, & Philippou, 2004). Although many of the sources are incredible references to enhance the performance of teacher education, none discuss the concerns that preservice agriculture teachers have for teaching students of different cultures (sources studying cultural concerns)

Purpose/Research Objectives

The purpose of this nonexperimental, descriptive-correlational study is to examine the level of concern toward teaching students of multiple cultures among preservice teachers in agricultural education. The following research objectives and hypotheses guided the study:

1. Describe preservice teachers (agriculture and other secondary areas) in terms of race, sex, home residency, and family's household income.
2. Describe the four constructs of multicultural teaching concerns (Familial/Group Knowledge, Strategies and Techniques, Cross-Cultural Competencies, and School Bureaucracy).
3. Describe the multicultural teaching overall concerns by the selected student characteristics (sex, race, home residency, and perceived family income).

Additionally, nine hypotheses were tested; for brevity, four hypotheses are collapsed into one and four into another.

$H_{01, 02, 03, 04}$: The proportion of variance in the constructs (Familial/Group Knowledge$_{01}$, Strategies and Techniques$_{02}$, Cross-Cultural Competencies$_{03}$, and School Bureaucracy$_{04}$) of multicultural teaching concerns cannot be predicted by the linear combination of selected student characteristics (sex, race, home residence, and predicted family income).

$H_{O5, 06, 07, 08}$: There was no statistically significant difference in the construct area (Familial/Group Knowledge$_{05}$, Strategies and Techniques$_{06}$, Cross-Cultural Competencies$_{07}$, and School Bureaucracy$_{08}$) for teaching multicultural students between secondary preservice agricultural education teachers and other secondary preservice teachers.

H_{O9}: There was no statistically significant difference in the overall level of concerns for teaching multicultural students between secondary agriculture preservice teachers and the other preservice teachers.

Methods/Procedures

The assessable population of this descriptive-correlational study was secondary preservice teachers at the University of Missouri whom were entering phase III of three teacher developmental program phases. The purposeful sample consisted of all secondary preservice teachers whom had completed their phase II during the 2009 spring semester (*n* = 113). The sample represented the seven secondary academic certification areas (Agriculture, Art, English, Mathematics, Music, Science, and Social Studies) offered at the University of Missouri. The Associate Dean of Academic Programs in the College of Education granted access to preservice teachers. Confirmation of participation was received following the approval of the lead faculty member of each phase II course. Faculty members from each phase II course set a desired meeting time and date for the researchers to distribute and collect the instrument.

The Multicultural Teaching Concerns Survey (MTCS) was used to measure the level of multicultural teaching concern as expressed by the preservice teachers. Marshall (1996) developed the MTCS, with modifications and further developments to Locke's (1988) multicultural awareness model and Fuller and Brown's (1975) three-stage teaching concern conceptualization: self, tasks, and impact. Four constructs constructs comprised the MTCS and included measures reflecting teaching concerns related to Familial/Group Knowledge (the culture among diverse students' families), Strategies and Techniques (effective teaching methods among different cultures), Cross-Cultural Competencies (teacher's knowledge, skills, and beliefs toward different cultures), and School Bureaucracy (identifying attitudes of intolerance toward diverse cultures within a school). The four constructs were derived from over 300 qualitative concerns and questions taken from 206 preservice and experienced teachers about teaching multicultural students. Statements of concern and questions were separated into the four constructs and matched by three independent judges. Marshall then conducted a three-round modified Delphi poll across judges, decreasing the concern pool into 64 questions. After further reliability testing, the 64 questions were reduced to 34: 14 in Familial/Group Knowledge, 10 in Strategies and Techniques, 6 in Cross-Cultural Competence, and 4 in School Bureaucracy.

A panel of experts (*n* = 6) with a similar research focus involving statistical and/or multicultural education at the University of Missouri reviewed the MTCS for face and content validity. To determine the reliability of the MTCS, it was piloted with preservice students enrolled in a multicultural diversity education course at the same university who were not included in the study (*n* = 20). Reliability estimates were determined using a Cronbach's alpha. The overall reliability estimate for the MTCS was .90. Reliability estimates were also determined for the four concern constructs: .73 for Familial/Group Knowledge, .82 for Strategies and Techniques, .87 for Cross-cultural Competence, and .51 for School Bureaucracy. The results were satisfactory, according to Nunnally and Bernstein (1994), except for School Bureaucracy. A panel of experts reexamined the School Bureaucracy anchor and restructured wording and sentence structure to minimize error, but did not develop critical change that would affect the overall score of the instrument. Following revision, the School Bureaucracy construct received a new reliability estimate of .68.

For students in each academic certification area, the data collection period was at the end of each academic area's methods of teaching course, one week prior to the final examination using the MTCS. Data were collected using a simple distribution of the instrument to each student in the phase II courses. Students were asked to rate their concern level tovarious questions on a 5-point Likert scale ranging from "extremely important concern" to "extremely unimportant concern".

Following the collection period, data were coded and entered into SPSS. Descriptive statistics of central tendency and variability were calculated to summarize the data. According to the Oliver and Hinkle (1982), it is reasonable to argue that a well-established cohort of subjects in any given year is likely to be representative of a cohort in a similar nature over time. Because this sample is a cohort grouping of preservice teachers, inferential analyses were applied to the data. Independent sample t-tests and ANOVA were conducted to test differences on the MTCS, and stepwise multiple linear regressions was calculated to estimate the variance in the four constructs for teaching multicultural students (Familial/Group Knowledge, Strategies and Techniques, Cross-Cultural Competencies, and School Bureaucracy) as explained by preservice teacher selected predictor characteristics. Effect sizes were calculated using Cohen's (1988) *d* coefficients and interpreted by Thalheimer and Cook (2002): negligible effect size ($d < 0.15$, small effect size ($d < 0.40$), medium effect size ($d < 0.75$), large effect size ($d < 1.10$), very large effect size ($d < 1.45$), and huge effect size ($d > 1.45$). An alpha level of .05 was established *a priori* for tests of significance.

Results/Findings

Research objective one sought to describe the selected characteristics (race, sex, home residency, and family's household income) of the secondary agriculture and other secondary preservice teachers. Female preservice teachers ($n = 69$; 61.10%) outnumbered male preservice teachers ($n = 44$; 38.90%) in both secondary agriculture ($n = 17$; 70.80%) and the other secondary preservice teachers ($n = 52$; 58.40%). Secondary agriculture preservice teachers were homogenous in race (White; $n = 24$; 100.00%) while the other secondary preservice teachers had a slight diverse composition with White as the dominant sample ($n = 75$; 84.30%) followed by Asian ($n = 5$; 5.60%), African American ($n = 5$; 5.60%), Hispanic ($n = 3$; 3.40%), and American Indian ($n = 1$; 1.10%). All preservice secondary agriculture teachers ($n = 24$; 100.00%) considered their home residence to be located in a rural setting, while the majority of the other secondary preservice teachers identified home residence as suburban ($n = 60$; 67.40%) rather than rural ($n = 19$; 21.30%) and urban ($n = 10$; 11.20%). A discrepancy in perceived family income seems to exist between the two set of preservice teachers. Thirteen of the 24 (54.20%) perceived their family's household income to be within the range of $35,000 to $49,999, while the majority of the other secondary preservice teachers ($n =31$; 34.80%) perceived their family household income to be $100,000 or greater.

Table 1 provides a description of the homogenous nature of the preservice teachers included in the study. This sample appears to reflect the parameters of the general teacher populations – 87 percent are White middle class teachers with suburban values (Segall & Wilson, 2004).

Table 1
Descriptive Characteristics of Agriculture and Other Secondary Preservice Teachers (n = 113)

	Agriculture Preservice		Other Preservice	
Characteristic	*F*	%	*f*	%
Sex				
Female	17	70.80	52	58.40
Male	7	29.20	37	41.60
Race				
White	24	100.00	75	84.30
African American			5	5.60
Asian			5	5.60
Hispanic			3	3.40
American Indian			1	1.10
Home Residence				
Rural	24	100.00	19	21.30
Suburban			60	67.40
Urban			10	11.20
Perceived Family Income				
< $35k			2	2.20
$35k - $49,999	13	54.20	12	13.50
$50k - $74,999	7	29.20	24	27.00
$75k - $99,999	2	8.30	20	22.50
$100k ≥	2	8.30	31	34.80

To gain a better view of the preservice teachers' certification area, Table 2 serves as a summary of the academic areas represented in the study.

Table 2
Certification Area of Secondary Preservice Teachers (n = 113*)*

Secondary Academic Certification Area	*f*	%
Agriculture	24	21.20
Social Studies	24	21.20
English	19	16.80
Math	15	13.30
Science	13	11.50
Music	10	8.80
Art	8	7.10

With research objective two, preservice teachers MTCS results were broken down into the four constructs (Familial/Group Knowledge, Strategies and Techniques, Cross-Cultural Competence, and School Bureaucracy). Concerns for Strategies and Techniques (*M* = 55.71; *SD* = 8.95) was out of a total concern level of 70, while Cross-Cultural Competence (*M* = 32.02; *SD* = 9.54) was out of a total concern level of 50. Familial and Group Knowledge (*M* = 24.40; *SD* =

3.53) represented six questions on the MTCS for a total concern level of 30 and School Bureaucracy (*M* = 14.61; *SD* = 3.19) only represented four questions for a total concern level of 20 (see Table 3).

Table 3

Familial/Group Knowledge; Strategies & Techniques; Cross-Cultural Competence; and School Bureaucracy Mean Scores (n = 113*)*

Cultural Competency	Mean Score	*SD*	Grand Mean[e]	Grand *SD*	Range
Strategies and Techniques[a]	55.71	8.95	3.98	0.64	20.00 – 70.00
Cross-Cultural Competence[b]	32.02	9.54	3.20	0.95	10.00 – 50.00
Familial/Group Knowledge[c]	24.40	3.53	4.07	0.59	14.00 – 30.00
School Bureaucracy[d]	14.61	3.19	3.65	0.80	6.00 – 20.00

[a]Out of 70 Points; [b]Out of 50 Points; [c]Out of 30 Points; [d]Out of 20 Points

[e]Scale based on: 1 = Extremely Unimportant Concern to 5 = Extremely Important Concern

Research objective three sought to describe the overall concern level of the preservice teachers based upon the characteristics of sex, race, home residence, and perceived family income. Tables 4 and 5 help in explaining this objective. Female preservice teachers are overall more concerned (*M* = 130.04; *SD* = 18.48) than male preservice teachers (*M* = 121.55; *SD* = 21.92) in teaching multicultural students (see Table 4). An independent (two-tailed) *t* – test revealed a significant difference ($t = 2.22$; $p < .05$) in level of concern held by female and male preservice teachers with a medium effect size ($d = 0.43$).

Table 4

Two-Tailed Independent t-test on Level of Teaching Concern by Sex (*n* = 113)

Sex	*n*	*M*	*SD*	*t*	*p*	Cohen's *d*
Female	69	130.04	18.48	2.22	.03*	0.43
Male	44	121.55	21.92			

*$p \leq .05$

In addition to the sex of preservice teachers, the remaining characteristics were evaluated as multichotomous variables. To complete research objective three, a univariate linear 3-way ANOVA model was conducted to determine the differences in overall level of concern for teaching students of different cultures by race, home residence, and perceived family income (see Table 5). No significant difference ($p > .05$) in overall level of concern was found among the group's family income, however, a significant difference ($p < .05$) in home residency existed. Due to concerns toward the unequal group size in race, a test of significance was not calculated however, descriptive measures are provided in Table 5.

Table 5

ANOVA of Concern Scores by Preservice Teacher Characteristics (n = 113)

Characteristic	n	M	SD	F	p
Race					
White	99	126.43	19.27		
Asian	5	133.80	28.82		
Black	5	127.20	34.39		
Hispanic	3	133.33	10.02		
American Indian	1	99.00	-		
Home Residence				4.23	.01*
Rural	43	122.81	19.75		
Suburban	60	126.85	20.09		
Urban	10	142.90	16.16		
Perceived Family Income				0.73	.57
< $35k	2	125.00	28.28		
$35k - $49,999	25	128.28	16.47		
$50k - $74,999	31	129.13	18.66		
$75k - $99,999	22	126.41	20.20		
$100k ≥	33	123.64	20.23		
Intercept				420.28	.01*

Home Residence: $F(2,110) = 4.23$, Adjusted $\text{Eta}^2 = .07$; $*p \leq .05$

A Levene's test revealed that an equal variance was assumed in the characteristic of home residency on the overall multicultural teaching concern score. Hochberg's GT2, post hoc, pair-wise comparison was utilized because of the unequal sample size between rural, suburban, and urban students. Hochberg's GT2 provides a calculation for the honest significant difference to address Type I error (Field, 2000). Results display a significant difference ($p < .05$) in the overall concern level among urban/suburban and urban/rural preservice teachers (see Table 6).

Table 6

Hochberg's GT2 Post hoc Pair-wise Comparison of Overall Concern Level by Home Residence

Home Residence	Mean Difference	p
Suburban/Rural	4.04	.66
Urban/Suburban	16.05	.05*
Urban/Rural	20.09	.01*

$*p \leq .05$

To test hypotheses 01, 02, 03, and 04, stepwise multiple linear regressions were utilized to predict the antecedents of preservice teachers' level of concern for teaching multicultural students in the four teaching concern constructs (Familial/Group Knowledge, Strategies and Techniques, Cross-Cultural Competencies, and School Bureaucracy) that can be predicted by their characteristics (race, certification area, sex, home residency, and family's household income). For race, subjects were dichotomized as either "White" or "Not White" (African-American, Asian, Hispanic, and Native American) and the academic certification areas were dichotomized as "Agricultural Education" and "Other Secondary Areas" (Social Studies, English, Mathematics, Science, Music, and Art). Intercorrelations were calculated to check for multicollinearity. According to Berry and Feldman (1991), bivariate correlations between independent variables yielding a .80 or higher were considered to display a high degree of multicollinearity. No multicollinearity issues were observed in each of the multiple regression analyses. Tables 7 and 8 display the results of the analyses.

It was revealed that nine percent of the variance of preservice teachers' concern in Familial/Group Knowledge (see Table 7) construct ($F(2,112) = 5.48$; $p \leq .05$) was predicted in their sex ($\beta = -.24$) and certification area ($\beta = .21$). Home residency, race, and perceived family income were non-significant predictors. Concern for using Strategies and Techniques (see Table 8) to teach multicultural students ($F(5,112) = 10.65$; $p \leq .05$) was predicted by their home residency ($\beta = .30$), certification area ($\beta = .18$), and sex ($\beta = -.25$). Null hypotheses 01 and 02 were rejected in favor of the alternative hypotheses that the proportion of variance in Familial/Group Knowledge and Strategies and Techniques is explained by the linear combination of characteristics.

Table 7
Stepwise Regression of Familial Group Knowledge Concern ($n = 113$)

Variable	R	R^2	b	β	t	p
Characteristics	.30	.09				
Sex[a]			-1.71	-.24	-2.59	.01*
Certification[b]			1.83	.21	2.33	.02*
(Constant)			23.62		32.82	.01*

Adjusted $R^2 = .07$; For Model: $F(2,112) = 5.48$; $*p \leq .05$
[a]Sex Coded: Female = 0; Male = 1
[b]Certification Area: Agricultural Education = 0; Other Secondary Areas = 1

Table 8
Stepwise Regression of Strategies and Techniques Concern ($n = 113$)

Variable	R	R^2	b	β	t	p
Characteristics	.40	.16				
Home Residence[c]			4.38	.30	3.48	.01*
Certification[b]			3.93	.18	1.56	.02*
Sex[a]			-4.49	-.25	-2.81	.01*
(Constant)			54.36		39.90	.01*

Adjusted $R^2 = .15$; For Model: $F(5,112) = 10.65$; $*p \leq .05$
[a]Sex Coded: Female = 0; Male = 1
[b]Certification Area: Agricultural Education = 0; Other Secondary Areas = 1
[c]Home Residence: Rural = 0; Suburban = 1; Urban = 2

As noted in Table 7, the Familial/Group Knowledge construct is explained by sex and certification area. The table provides information that preservice agriculture male teachers have significantly lower multicultural concern for familial/group knowledge than another group. Table 8 explains that the home residence, certification area, and sex play a significant role in their multicultural concern for the strategies and techniques in teaching students of a different culture.

Hypotheses 03 and 04 state, the proportion of variance in the construct areas (Cross-Cultural Competencies and School Bureaucracy) of multicultural teaching concerns is not explained by the linear combination of the demographic areas. Using stepwise multiple linear regression, no unique variance was explained in each construct area resulting in a failure to reject null hypotheses 03 and 04.

Two-tailed, independent t-tests were calculated to test hypotheses 05, 06, 07, and 08. Each hypothesis sought to determine if statistical differences existed between secondary preservice agriculture teachers and other secondary preservice teachers by each construct of multicultural teaching concern (Familial/Group Knowledge, Strategies and Techniques, Cross-Cultural Competence, and School Bureaucracy). Table 9 provides the results. As noted in the concern construct Familial/Group Knowledge, other secondary preservice teachers received a mean score of 24.74 ($SD = 3.72$) which is significantly ($p < .05$) higher than agriculture preservice teachers ($M = 23.13$; $SD = 2.38$) with a medium effect size ($d = 0.47$). Therefore, for Familial/Group Knowledge, equal variance is assumed with a significant t-value of -2.02.

Other secondary preservice teachers ($M = 56.76$; $SD = 9.20$) responded higher than agriculture preservice teachers ($M = 51.79$; $SD = 9.20$) in the construct area of Strategies and Techniques (see Table 9). The difference was significant ($p < .05$) with a medium effect size ($d = 0.55$). Equal variance was not assumed, yielding a significant t-value of -2.83.

Significant difference was found in the independent t-test on the construct areas of Familial/Group Knowledge and Strategies and Techniques. Null hypotheses five and six were rejected in favor of the alternative hypotheses which state differences do exist in the constructs of concern between preservice secondary agriculture teachers and other preservice secondary teachers. For the constructs of Cross-Cultural Competence and School Bureaucracy concerns, a significant difference was not found ($p < .05$). Null hypotheses 07 and 08 were not rejected.

Table 9

Two-Tailed Independent t-test on Multicultural Teaching Concern Constructs of Preservice Secondary Teachers ($n = 113$)

Concern Constructs	*n*	*M*	*SD*	*t*	*p*	Cohen's *d*
Familial/Group						Medium
Agriculture	24	23.13	2.38	-2.02	.04*	0.47
Other Secondary	89	24.74	3.72			
Strategies/Techniques						Medium
Agriculture	24	51.79	9.20	-2.83	.01*	0.55
Other Secondary	89	56.76	9.12			
Cross Cultural Competence						Negligible
Agriculture	24	31.83	9.20	-0.11	.91	0.03
Other Secondary	89	32.07	9.68			
School Bureaucracy						
Agriculture	24	13.96	3.34	-1.09	.28	Small
Other Secondary	89	14.79	3.14			0.26

*$p < .05$

Hypothesis 09 is better explained in Table 10, which includes the one-way ANOVA findings for overall multicultural teaching concern levels in preservice teachers. The overall model was found to be significant ($p < .05$). The test of significance lead to rejecting null hypothesis 09 and accepting the alternative hypothesis that suggests there is a difference in the overall level of concerns for teaching multicultural students among the secondary preservice teachers. A significant difference among the group variance existed and as the result of the Levene's test, equal variance was assumed leading to performing a Tukey, post-hoc, pair-wise comparison (Table 11). Tukey post-hoc was utilized as a relatively conservative approach to addressing Type I error (Field, 2000). The Tukey comparison revealed a significant difference in overall multicultural teaching concern scores between secondary Agriculture/Social Studies, Agriculture/Art, and Agriculture/English preservice teachers.

Table 10
ANOVA of Concern Scores by Certification Area (n = 113)

Academic Certification Area	*n*	*M*	*SD*	*F*	*p*
				3.97	.01*
Agriculture	24	120.71	17.47		
Social Studies	24	133.08	17.12		
English	19	137.63	15.73		
Math	15	114.67	23.02		
Science	13	116.54	17.28		
Music	10	129.00	25.69		
Art	8	136.25	17.94		

Academic Certification Area: $F(6,112) = 3.97$; *$p \leq .05$
Adjusted Eta^2 = .14

Table 11
Tukey Post hoc Pair-wise Comparison of Preservice Secondary Agriculture Teachers with Other Preservice Secondary Teachers

Certification Area	Mean Difference	*p*
Agriculture/Math	6.04	.96
Agriculture/Science	4.17	.99
Agriculture/Music	-8.29	.90
Agriculture/Social Studies	-12.38	.05*
Agriculture/Art	-15.54	.04*
Agriculture/English	-16.92	.03*

*$p \leq .05$

Conclusions/Implications/Recommendations

The following conclusions and recommendations are based upon the findings. The concern construct area of Familial/Group Knowledge received the highest concern score held by preservice teachers; followed closely by their concern toward the Strategies and Techniques in teaching multicultural students. The college of education at the University of Missouri places a lot of emphasis on teaching strategies and techniques and because of these efforts, it implies why the Strategies and Techniques construct received higher scores. The high concern scores towards a student's family and group knowledge could be due to the large population of female preservice teachers. To capitalize on the two high concern construct areas, it is recommended that the college of education begin to address the constructs by preparing preservice teacher's efficacy level in various classroom strategies and techniques that benefit different cultures as well as essential steps in working with families and groups of a different culture. The lowest two construct areas, School Bureaucracy and Cross-Cultural Competence, suggest that a greater level of awareness is needed before an efficacy level is addressed. To build preservice teachers' concern levels, it is recommended that educators provide students with opportunities to work and observe in schools with various cultures that allow a stronger understanding. In addition, qualitative interviews of teachers, administrators, and students from schools of multi-cultures will help in the education process that will reflect a higher concern in cross-cultural competence and school bureaucracy.

Females and male preservice teachers differ significantly on the overall concern level of teaching multicultural students, where females appear to have the higher level of concern. It is possible that females' concern scores are higher due to their nurturing care or their cautious behavior. Although research implies that race of a teacher affects the educational outcome of the teacher (King, 1993), there was no significant relationship between preservice students' race and their overall concern level in teaching multicultural students. However, this might be due to the homogenous nature of the preservice teachers in the study. Urban students differ significantly on their overall level of concern than did suburban and rural preservice teachers. This implies that rural preservice teachers have a narrow definition of "culture" as a subject of race, which they received minimal association with as oppose to students from an urban background. It is recommended that college educators strengthen their efforts to educate students about various cultures in a classroom. In addition, it is recommended that male preservice teachers receive additional opportunities to practice teaching in more diverse schools. Although not significant, it should be noted that students who perceived their family income in a middle class representation expressed a higher level of concern than students from higher and lower perceived family income levels. This implies that both rural and higher perceived family income preservice teachers assume to teach in schools that represent the population demographics of the school they attended. Preservice teachers representing a middle class perceived family income may reside in a diverse school population. It is recommended that teacher educators provide all preservice teachers experiences in school with culturally diverse populations through service learning hours, observations, and practical teaching experiences.

When predicting students' concern levels from the four teaching concern constructs (Familial/Group Knowledge, Strategies and Techniques, Cross-Cultural Competence, and School Bureaucracy), two were found to be significant (Familial/Group Knowledge and Strategies and Techniques). Female preservice teachers in an education certification area other than agriculture have the highest level of concern for the Familial/Group Knowledge construct area. This implies that agriculture education preservice teachers at the University of Missouri anticipate a teaching job similar or close to their home residence. This anticipation provides agriculture preservice teachers with an assumption that the classroom students' family and group background will be similar to their own. The opposite is true to the secondary preservice teachers that represent the other certification areas. These students have a better concern toward the possibility that their students' family and group background could be different from their own. It is recommended that agricultural teacher educators help students identify the cultures they are accustomed to and then immerse preservice teachers in various family and group lifestyles. This could be accomplished with the help of student teaching placements in multicultural communities or through multicultural out-of-the-box experiences.

The second concern construct area that was significant addresses the strategies and techniques utilized in teaching students of different cultures (Strategies & Techniques). It was concluded that urban, female preservice teachers from a certification area other than agriculture have the greatest level of concern. This implies that agricultural preservice teachers who are male, at the University of Missouri, are disadvantaged versus their other content area colleagues. It is recommended that efforts be made to offer experiences that provide greater understanding of the different strategies and techniques that are successful among different cultures. Agriculture preservice teachers, especially males, need experiences that allow each to practice the strategies and techniques among students of different cultures. It is recommended that these obtained strategies and techniques be practiced in classrooms representing diverse cultures. Opportunities to obtain strategies and techniques among diverse cultures include, but not limited to: urban schools, study abroad experience, secondary classrooms in art, social studies, or English, etc..

In the constructs of Familial/Group Knowledge and Strategies and Techniques, preservice agriculture teachers are significantly less concerned than their other secondary colleagues. A medium effect size exists in the variance of Familial/Group Knowledge and Strategies and Techniques, while a small effect size in the variance of School Bureaucracy exists between agriculture and other secondary preservice teachers. Overall, this suggests that the agricultural education department at the University of Missouri should provide more opportunities for their preservice teachers to understand diverse cultures and identify the best practices for teaching students who are culturally different from themselves. It is recommended that immersion projects exists with secondary agriculture programs in urban and rural school districts that represent a diverse enrollment of culture.

Although agricultural preservice teachers received an overall concern score lower than the majority of their peers, a significant difference was found between preservice agriculture teachers and the preservice teachers in the areas of social studies, English and art. This implies that social studies, English, and art preservice teachers have a department that encourages students to understand diverse cultures and understand the benefit of teaching to all students. social studies and English preservice teachers represent core content area classrooms that embody every student in a school. It would benefit agricultural teacher educators collaborate with social studies, English, and art teacher educators in developing collaborative practices and professional development opportunities for agriculture preservice teachers.

Recommendations for Further Research

Further research should examine why differences exist among multicultural teaching concern levels in the academic areas. Other independent variables that may have an effect on an individual's concern level (i.e. interaction with students of different culture, cumulative grade point average, and whether the student continues to commute from home or not) needs to be examined. Based upon the literature review, it is assumed that higher concern for teaching students of a different culture will result in an increased enrollment of diverse cultures. Some preservice agriculture teachers may lack concern due to a lack of interaction with culturally different students in their upbringing. Qualitative research should be conducted to determine this phenomenon.

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Competency Modeling in Extension Education: Integrating an Academic Extension Education Model with an Extension Human Resource Management Model

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The purpose of this study is to compare and contrast an academic extension education model with an Extension human resource management model. The academic model of 19 competencies was similar across the 22 competencies of the Extension human resource management model. There were 7 unique competencies for the human resource management model. The integration of the models was informative to support and confirm the educational directions of each model. The human resource management model provided information for potential areas to include in the academic preparation of entry-level educators and agents. The academic extension education model indicated possible educational opportunities for credit and non-credit course work.

Introduction

As organizations moved into the 21st century, they have faced pressures resulting in organizational change. In recent years, a number of challenges or issues have been identified for Cooperative Extension in the 21st century (Seevers, Graham, & Conklin, 2007; ECOP, 2002; Ladewig & Rohs, 2000; McGee, 2006) with a focus on increasingly complex and changing social, environmental, and economic conditions that have produced external factors impacting Extension's ability to carry out its mission (Ladewig & Rohs, 2000). Several authors (ECOP 2002; Ladewig & Rohs, 2000; McGee, 2006; Seevers et al., 2007; Warner, Rennekamp, & Nall, 1996) have described the external factors or pressures facing Extension organizations including technology, diversity, competition and resources, globalization, and a changing knowledge base.

Trends and issues specifically affecting Extension structure, function, and staffing include: funding issues; changing clientele needs; restructuring, downsizing, and changes in staffing patterns; and variations in delivery methods or how the mission is achieved (Morse, 2009; Seevers, et al., 2007; Warner, Rennekamp, & Nall, 1996). Ladewig and Rohs (2000) described an increased focus on human capital in Extension and how profound and interconnected changes are producing internal challenges requiring employees to become more customer-driven, focused on cost effective approaches, fast and flexible to meet changing needs, process-oriented, involved in shared leadership, and focused on continuing to improve to satisfy customer expectations. Finally, ECOP (2007) summarized internal challenges in three key areas including: (a) becoming more flexible and agile in identifying and serving a diverse array of clientele, (b) strengthening and diversifying funding streams, and (c) speeding up the rate of organizational transformation.

Extension organizations have historically placed a high value on their people. However, the 21st century is a time of change for Extension organizations; a time when more than ever, success depends on the knowledge and capabilities of employees. In this changing environment, authors in human resource management and specifically Extension organizations (Maddy, Niemann, Lindquist, & Bateman, 2002; Stone & Bieber, 1997) recommend competencies as a powerful tool that can provide focus on individual behaviors that contribute the most to organizational success.

Competency identification, modeling, and assessment are not new to Extension organizations. Within the U.S., a number of state Extension organizations have adopted a set of competencies for some or all of their employees and the Cooperative Extension System developed a list of core competencies. A number of studies have examined best practices for Extension professional development (Bailey & Deen, 2007; Conklin, Hook, Kelbaugh, & Nieto, 2002; Gamon, Mohamed, & Trede, 1998) and competencies needed for successful employment in Extension organizations (Cooper & Graham, 2001; Michigan State University Extension, 2003; Stone & Coppernoll, 2004).

Investigations have also been conducted to develop academic models designed to deliver core competencies through academic extension education programs (Scheer, Ferrari, Earnest, & Connors, 2006; Harder, Mashburn, & Benge, 2009). However, no studies (to the authors' knowledge from the review of the literature) have jointly integrated Extension human resource management competencies and academic extension education competencies to better inform each other. Given the rapid rate of change facing organizations today, large gaps in time could be significant. This is especially true in an environment where organizational structures have changed in many states' Extension organizations.

Theoretical Framework

The competency movement has roots from over 50 years ago when Flanagan (1954) developed key methodologies used in subsequent competency studies. During the same period, psychologist Robert White (1959) identified a human trait he called competence and described it in terms of an organization's capability to interact with its environment effectively. McClelland is credited with coining the term competency, which he defined as a characteristic that underlies human performance (McClelland, 1973). Although many different methods for identifying competencies have evolved, most share certain characteristics, following McClelland's dictate to determine what leads to superior performance and find out what superior performers do (Lucia & Lepsinger, 1999).

A competency approach to human resource management and academic curriculum development can be a useful framework for building organizational capacity and ensuring academic program relevancy. Competencies are defined as a collection of observable dimensions (individual skills, knowledge, attitudes, behaviors and collective processes and capabilities) which are necessary for individual, organizational, and program success (Athey & Orth, 1999). Competencies serve as the foundation for organizations to identify the focus of their efforts and strengths (Vakola, Soderquist, & Prastacos, 2007) and specifically for Extension to deliver needed programs and improve its value to communities (Maddy, Niemann, Lindquist & Bateman, 2002).

The competency approach, as formulated by McClelland (1973), posits that competencies are ideal for determining the potential for effective performance of individuals which ultimately impacts organizational outcomes. Therefore competencies should drive professional development and training which ultimately should influence educational efforts in the academic preparation of Extension professionals.

Purpose and Objectives

The purpose of this study was to compare and contrast results from two recent competency modeling efforts: an academic extension education model (Harder, Place, & Scheer, in press) and a model developed for human resource management in Extension (Cochran, 2009). Specific objectives were to: (1) examine the models for similarities and differences; (2) describe how the combined results inform academic extension education for credit and non-credit coursework or in-service training; and (3) identify gaps in current research on competencies for professionals in the Cooperative Extension System.

Methods

The methods section is divided into two parts: (1) a national Delphi study to determine academic extension education competencies for beginning educators or agents and (2) a study to develop and validate a competency model for a state Extension organization's use in human resource management for all employees from office support staff to administrators and state specialists.

Academic Extension Education Study

A national study was conducted to determine the academic extension education competencies required for entry-level Extension educators/agents to be successful in the year 2015 (Harder, Place, & Scheer, in press). The use of a Delphi panel is especially useful for futuring (Cornish, 2004) and as a group communication process for addressing complex issues or problems (Linstone & Turoff, 2002).

A panel of experts was identified by contacting all 50 state directors of Extension to nominate two Extension experts internal to their states and two external Extension experts. Thirty-three directors responded resulting in 117 nominations. Duplicate nominations were labeled as individuals who were highly regarded in the Extension field. Ten potential panelists were nominated through this method (seven state directors, two specialists, one associate dean). To include panelists who were experts in their fields of study, elected officers from each of the educators/agents associations (NAE4-HA, NACAA, NACDEP, NEAFCS, and ANREP) were invited to serve as panelists. This resulted in five additional individuals. A final list of 15 potential panelists was determined. Each person was mailed a personalized invitation explaining the purpose of the study, informed consent, and directions for opting out. This process resulted in 12 Delphi panelists.

The Delphi study consisted of four phases to collect broad levels of data to form concise summaries (Linstone & Turoff, 2002). Round 1 asked participants to develop their vision of Cooperative Extension in 2015. The vision statement was used to generate competencies in Round 2 that would be essential for the 2015 entry-level Extension educator/agent. Panelists in Round 3 indicated their level of agreement with the competency statements using a six-point rating scale (1 = *strongly disagree* to 6 = *strongly agree*). The level of consensus a competency needed to achieve was determined *a priori* (66% of the respondents needed to rate an item "agree" or "strongly agree" to progress to the next round). This follows previous research in agricultural and extension education (Martin, Fritzsche, & Ball, 2006; Shinn, Wingenbach, Briers, Lindner, & Baker, 2009). Final competencies were determined in Round 4 as panelists confirmed their selections of competencies.

Extension Human Resource Management Study

The study was conducted to develop and validate a competency model for a state Extension organization that was transitioning from a jobs-based to a competency-based approach to human resource management (Cochran, 2009). Decisions on research design and methods were based on recommendations from the literature on competency modeling (e. g., Dubois, Rothwell, Stern, & Kemp, 2004; McLagan, 1988; Rothwell & Lindholm, 1999) The study was designed as action research (Noffke & Somekh, 2005; Patton, 1990) with a series of highly participatory approaches used to engage employees in developing, refining, and validating a competency model. Mixed methods (Jones, Torres, & Arminio, 2006) were used with an emphasis on qualitative approaches including reviews of existing research and gathering data from employees through interviews and focus groups. Peer debriefing and survey research were used to validate and further refine the competency model.

The study took place in a mid-western state Extension organization with purposeful sampling used to select various groups of employees for participation as key informants; they participated as members of the Administrative Cabinet, a Competency Project Team (CPT - composed of exemplary performers and key internal stakeholders), focus group participants (drawn from exemplary performers), and survey respondents (a census of the exemplary performer criterion group). CPT members and exemplary performers represented all the job groups in the organization including office support, program support, program management, technical support, educators, specialists, and administrators.

The research design included multiple cycles of data gathering, analysis, integration, and peer debriefing. The multiple-step process for this study included four phases: background review and initial data collection, model development, model refinement and validation, and final review. During Phase I, existing data were reviewed and assembled for use in the study including research on competency-based human resource management and competency modeling, data on external forces and internal context, and existing competency lists or models. A criterion group of exemplary performers was identified using peer nominations, supervisory nominations, and performance data. New data were then gathered on context, competencies, and organizational alignment through interviews and member checks with an administrator as well as a CPT session using a modified nominal group process.

In Phase II, a draft competency model was constructed using data from Phase I. Then using data from Phase I, new data (from group interviews with Administrative Cabinet, CPT Session #2, and focus groups with employees), and two analysis and integration steps, a new model was constructed. A questionnaire was developed using model content for model refinement and validation in Phase III. Respondents from a pool of exemplary performers identified in Phase I completed the survey, which included importance ratings for trends, competencies, and key actions. Survey data were analyzed and integrated to create a final draft of the model. Finally, in Phase IV the Administrative Cabinet and the CPT reviewed the final draft of the model and provided feedback through group interviews that was then used in a final data integration step to develop the Competency Model.

Results

Academic Extension Education Study

Panelists generated 25 competencies in Round 2; 24 competencies in Round 3 and finally 19 competencies in Round 4 reached the *a priori* level of agreement. The 19 competencies are presented in Table 1. Many of the competencies can be broadly grouped to the program development process and core interpersonal skills. For in-depth information of this national study refer to Harder, Place, and Scheer (in press).

Table 1
Entry-Level Extension Educator Competencies for 2015

Core Interpersonal Skills
- Communication skills (including oral and written)
- Cultural Sensitivity
- Interpersonal Skill
- Organizational leadership development
- Personal leadership development
- Problem-solving
- Professionalism
- Relationship building
- Self-management

Extension Program Development Process
- Program planning
- Program implementation
- Program evaluation
- Teaching skills
- Accountability
- Able to utilize technology for program delivery

Other Competencies
- Applied research skills
- Develop extramural funding
- Technical/subject matter expertise
- Volunteer development

Extension Human Resource Management Study

A competency model was developed, refined, and validated using a multiple step process as described in the methods section. Results used to inform model development included existing literature and contextual data, analysis of interviews with administrators, modified nominal group process data from the Competency Project Team, and focus groups. Survey respondents reviewed a draft model with 14 core competencies. Competencies were defined and further described by key actions in the model. Each competency was rated as very important or essential by at least 82% of respondents and therefore each was retained in the model.

The final data integration phase, incorporating both an analysis of open-ended comments from the survey and an analysis of final groups interviews with Administrative Cabinet and the CPT, resulted in a model with 14 core competencies (see Table 2), each with a definition and three to eight key actions illustrating the competency. The model included multiple layers. One layer was the core competencies. Another layer was areas of expertise (AOEs) listed in Table 2. For detailed information about this larger study refer to (Cochran, 2009).

Table 2
Core Competencies and Areas of Expertise for a State Extension Organization's HR Model

Competencies
Communication
Continuous learning
Customer service
Diversity
Flexibility and change
Interpersonal relationships
Knowledge of Extension
Professionalism
Resource management
Self-direction
Teamwork and leadership
Technology adoption and application
Thinking and problem solving
Understanding stakeholders and communities
Areas of Expertise (AOEs)
Extension teaching
Information technology
Management and supervision
Marketing
Program planning, development, and evaluation
Research
Subject matter expertise
Volunteer management

Note. AOEs are preliminary. Identified from qualitative data but were not refined/ validated.

Areas of expertise (AOEs) were used in this model to distinguish between what is meant by core competencies, defined as a broad set of competencies that cut across job groups, and AOEs, described as the specific subject matter, technical, or professional knowledge and skills required for successful Extension work in individual jobs or job groups. They are above and beyond the core competencies. In order to be successful in a given job, Extension professionals must have a foundation of the appropriate core competencies and a blend of unique AOEs. While some Extension work is highly specialized, most require expertise in several AOEs.

Integration

The 19 competencies identified by the academic extension education model were similar to the 22 competencies of the Extension human resource management (HRM) model. See table 3 for the competencies that were similar to each other. Seven competencies unique to the Extension HRM model were: knowledge of Extension, flexibility and change, understanding stakeholders and communities, management and supervision, marketing, continuous learning, and customer service.

Table 3
Competency Comparison

Extension Professional Development Model	Academic Extension Education Model
Similar Competencies	
Communication*	Communication skills
Program Planning, Development, and Evaluation	Program planning Program Implementation Program Evaluation
Interpersonal Relationships*	Interpersonal Skill Relationship building
Diversity*	Cultural Sensitivity
Thinking and Problem Solving*	Problem-solving
Professionalism*	Professionalism
Extension Teaching	Teaching skills
Information Technology Technology adoption and application	Able to utilize technology for program delivery
Volunteer Management	Volunteer development
Subject Matter Expertise	Technical/subject matter expertise
Self-Direction*	Self-management
Research	Applied research skills
Teamwork and Leadership*	Organizational leadership development Personal leadership development
Resource Management*	Accountability Develop extramural funding
Unique Competencies	
Knowledge of Extension	
Flexibility and Change	
Understanding Stakeholders and Communities	
Management and Supervision	
Marketing	
Continuous Learning	
Customer Service	

Note. For purposes of this study, the areas of expertise from the state Extension model are classified with the competencies for comparison to the academic extension education model.

** Definitions established in the Extension HRM model*

Conclusions, Limitations and Recommendations

The purpose of this study was to compare and contrast two competency models developed from recent research in the Cooperative Extension System. The findings revealed consistent overlap in competencies from a model developed for academic extension education and a model for human resource management in Extension. The similarities in competencies were reaffirming to know that Extension professional development and academic extension education agree on the same direction for the knowledge, skills, and abilities needed for effective Extension work in the U.S.

The unique competencies found in the Extension HRM model may inform the other about areas to consider for inclusion to better prepare Extension professionals before and after they are hired into the profession. The unique competencies may have been identified because of the focus on exemplary performers across the organization versus the focus on entry level Extension educators in the national model. Alternatively, differences may have reflected the unique characteristics of the state's extension system.

The integrated models address most of the assumptions of the competency approach as posited by McClelland (1973). Specifically the competencies are relevant for successful outcomes, need for demonstrated competencies, and evidence for educational criteria for entry-level Extension professionals. The results for both models provide guidance for the hiring and education of Extension educators.

Based on the literature, the findings, and the authors' experience as Extension practitioners and faculty in extension education, the following conclusions were reached:

1. The models are congruent and add validity to each other. All competencies identified in the academic extension education model were identified in the Extension HRM model. The Extension HRM model established definitions for its core competencies. Defining competencies is a critical component for utilizing the competency model approach. The HRM model definitions can be used as a starting point to describe each competency. The competencies are generally congruent with the literature for organizations in general (ASTD, 2006; U.S. Office of Personnel Management, 2006) and for Extension organizations. The shared competencies are found in other existing Extension competency models (Coppernoll & Stone, 2003; Liles, 1999; Maddy, Niemann, Lindquist & Bateman, 2002; Michigan State University Extension, 2003)
2. The commonalities between the two models and other research findings (Harder, Mashburn, & Benge, 2009) suggest that some important competencies may be underrepresented in academic curriculum for preparing Extension professionals.

Several authors (Garst, Hunnings, Jamison, Hairston, & Meadows, 2007; Maddy et al., 2002) have made the case for highly competent professionals being critical to the future of Extension. Based on recent research with Cooperative Extension directors, the Extension Committee on Organization and Policy (2007) suggested improving the quality and skills of Extension professionals as one strategy for transforming Cooperative Extension. Given the concerns about talented employees, it is recommended that Extension systems assess their human resource management practices using the competencies to inform efforts in hiring, professional development, and other key functions. At the same time, academic extension education programs should examine their curricular requirements and implement updates and revisions as needed.

It is important to mention the limitations of this study. The two competency models integrated in this study were constructed using different methods, data was collected from different subjects, and the models were developed for different purposes. There are clearly limitations for comparing a study conducted in one state's Extension organization to a national study. However, the comparison is valuable because each investigation informs the other and adds validity to the results. This limitation could be addressed with additional research in other states or across multiple states identifying and describing the competencies of exemplary performers.

In order to better understand competencies needed for employees in Extension, further research is warranted in multi-state studies examining the competencies of high performing employees. This research could be used to refine and validate the competency models described here. Additional competency data could be used to develop a competency dictionary for the Cooperative Extension System. This dictionary, a master list of well-researched competencies, definitions, and behavioral indicators for Extension organizations, could aggregate existing research and provide a valuable tool for updating or creating new competency models for academic extension education or for human resource management in Extension. Finally, research is needed to confirm the results of this study which identified competencies that are important to have attained by graduation from academic programs (entry) and competencies required for exemplary performance in Extension work.

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An Assessment of the Inservice Training Needs of Mississippi County Extension Directors In the Area of Program Needs Assessment

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Abstract

The purpose of the study was to address in-service training needs of Mississippi County Extension Directors in the area of program needs assessment. The study used a descriptive survey research design. Descriptive statistics, including frequencies, percentages, means and standard deviations were utilized in the study. The Borich Needs Assessment Model was used to analyze the in-service training needs of County Extension Directors. Findings from the study indicated that County Extension Directors need in-service training on needs assessment. County Extension Directors reported below average competency in the following areas: analyzing survey data, interpreting statistical data, identifying sources of statistical data, and entering survey data into spreadsheets. The findings also indicated that County Extension Directors lack an understanding of how needs assessment impact funding of programs within Mississippi State University Extension Service. Findings show there is a need to re-offer training on the Strengthening Extension Advisory Leaders Curriculum since the result of knowledge and usage is extremely low. Additional finding revealed that County Extension Directors need training on the Logic Model.

Introduction

The mission of the Mississippi State University Extension Service is to provide research-based information, educational programs, and technology transfer that focus on the issues and needs of the people of enabling them to make informed decisions about their economic, social, and cultural well-being.

The objective of the Mississippi State University Extension Service is to educate and empower people to make sound decisions involving vocations, families, and their community environment. The Mississippi State University Extension Service initiates positive change within individuals, families, and communities in the following ways. (1) Providing research and education in a practical and applicable way. (2) Using the latest technology and teaching techniques to serve clients. Developing and using volunteers to help disseminate programs and information. (3) Cooperating with other groups and agencies. (4) Maintaining a culturally diverse staff responsive to the needs of various audiences' at all socio-economic levels (msucares.com).

Mississippi State University Extension Service continues to search for ways to help individuals cope with an ever-changing society. This is a critical need in human resource development. The primary task of Extension education is to disseminate practical and useful information on a broad range of subjects to diverse audiences. One of the major responsibilities of the Extension professional is to present unbiased facts that help people identify their problems and needs, and to guide and assist them in making their own decisions to solve these problems using the latest and most appropriate technology available (Prawl, Medlin, & Gross, 1984). The restructuring of the Mississippi State University Extension Service has created a need to analyze how County Extension Directors view needs assessment.

Related Literature

The past decade and a half has brought major changes to Extension. Many states have re-organized the structure of extension, reduced staff, and introduced interdisciplinary teams and partnerships to implement programming. The County Extension Director provides leadership and coordination for the total extension education effort in agriculture and natural resources, family and consumer sciences, 4-H youth development, and community resource development. He or she consults and maintains a positive relationship with appropriate local program advisory groups, community leaders, public officials, representatives of target audiences, and the county extension executive board to analyze data and identify needs. The County Extension Director also develops measurable goals and an annual plan of work in collaboration with the appropriate agents, specialists, and priority program group (PPG).

In 2002, Boone, Safrit, and Jones defined needs as the "difference between the present condition of the learner and an acceptable norm" (p. 143). According to Leagans (1964), "needs represent an imbalance, lack of adjustment, or gap between the present situation or status quo and a new or changed set of conditions assumed to be more desirable" (p. 89). The existence of needs assessment has been traced back several thousands of years (Tuomisto, 1981). Needs assessment is a process for identifying gaps in results and arranging them in priority order for resolution. These gaps are discrepancies between what should be and what the current conditions are. Needs assessment can be used in several ways. Sometimes the gap between "what is" and "what should be" establishes the objectives for programs. Conducting needs assessment provides many advantages to individuals planning collaborative efforts. A major advantage is the generation of new ideas and alternatives for dealing with needs (Archer, Cripe, & McCaslin, 2001). Needs assessment is a critical element of effective extension programming

According to Boyle (1996), the linkage between extension specialists and county agents is the bridge between people's needs and the knowledge base of the university. Extension specialists have the responsibility to synthesize, evaluate, integrate, and apply research information and expertise from within the land-grant university system in support of county programming efforts (Taylor & Summerhill, 1994). This study utilized the following two models: the Wisconsin Logic Model and the Borich Needs Assessment Model. The Wisconsin Logic Model was designed to assist in planning, implementing, evaluating, and communicating more effectively, (Taylor-Powell & Henert, 2008). The Logic Model analyses needs and assets which confirms the vital role needs assessment. The Borich Needs Assessment model (Borich,1980), was based upon what is and what should be by looking at follow up studies of preservice and in-service education" (p. 39).

Purpose

The purpose of this study was to determine the in-service training needs of Mississippi State University Extension Service County Directors in the area of program needs assessment.

Research Objectives

The objectives of this study were to (1) Describe County Extension Directors perceptions of importance and competence in needs assessment skills. (2) Describe in-service training needs of County Extension Directors in the area of needs based on the weighted discrepancy model. (3) Describe County Extension Directors perceptions of the benefits of needs assessment. (4) Describe County Extension Directors perceptions of the implementation of needs assessment. (5) Describe County Extension Directors perceptions of their use of needs assessment results. (6) Describe relevance of County Extension Directors demographics among program of focus areas as it pertained to needs assessment. (7) Determine the knowledge and usage of Strengthening Extension Advisory Leaders (SEAL) Curriculum.

Method/Procedure

Population

The population consisted of the Mississippi County Extension Directors as of January 1, 2008 ($N = 80$). At the time of the study there were 80, County Extension Directors. All County Extension Directors and agents with County Extension Directors responsibilities were invited to participate voluntary in this study.

Instrumentation

The construction of the instrument was developed from suggestions by Dillman (2007). The questionnaire used to collect data was modified from two previous studies: Bentlejewsk (2003), *Assessment utilization by extension faculty*, and Schwarz (2005), *A Needs Assessment of Aquaculture Extension Agents, Specialists, and Program Administrators in Extension Programming*. The instrument was divided into the following sections: (a) conducting needs assessment, (b) benefits of needs assessment, (c) implementing needs assessment, (d) using needs assessment result, (e) demographics, strengthening extension advisory leaders curriculum (SEAL), and (f) comments. A panel of experts made up of six Mississippi State University Extension Service employees and a retired extension County Director assisted in validating the survey instrument.

Data Collection

The questionnaire was administered using electronic survey through SurveyMonkey.com. Participation letters were sent out through SurveyMonkey informing the County Extension Directors of the upcoming survey and reminding them that their participation was voluntary. The first request was sent to 80 County Extension Directors and 20 responded. A second request was sent to the 60 non-respondents and 7 responded to the request. Following the second request, a third request was sent to the 53 non-respondents and 18 responded to the request. A fourth request was sent to the 35 non-respondents and 7 responded. For the 28 non-respondents a hard copy of the survey was mailed and 12 responded. Sixteen County Extension Directors did not respond to the requests. Data collection ended with an 80% response rate.

A random sample of non-respondents was contacted by phone and asked to answer 10 randomly selected questions from the survey. These responses were then compared to the responses of the respondents on the same 10 questions. Only one out of the 10 *t* tests of the comparison of non-respondents to respondents was found to be statistically significant "Improve the quality of my county programming". Therefore, it was concluded that the County Extension Directors that responded were an unbiased sample of the participants and the results were representative of the population (Ary et al., 2002, p. 408).

Analysis of Data

The research design in this study was a descriptive survey. Data were analyzed with SPSS 15 (2006). Descriptive statistics, including frequencies, percentages, means and standard deviations were utilized. The Borich Needs Assessment Model was used to analyze the in-service training needs of County Extension Directors (Borich 1980).

Results/Findings

The first objective in the study was to describe County Extension Directors perceptions of importance and competence in needs assessment skills. County Extension Directors rated "identifying appropriate advisory group members" as the most important need ($M = 4.20$), and setting needs based priorities for programming ($M = 4.14$) as second. "Constructing an on-line survey" and "using a case study to identify need" were rated least important by the overall group with means of 3.03 and 3.25, respectively. The second component in the first objective was to describe County Extension Directors perceptions of competency in needs assessment. County Extension Directors reported being most competent in "identifying appropriate advisory groups members" ($M = 4.08$). County Extension Directors reported being the least competent in analyzing survey data ($M = 2.98$), "interpreting statistical data" ($M = 2.84$), "identifying sources of statistical data" ($M = 2.81$), and "entering survey into spreadsheets" ($M = 2.78$). Ten competencies had means between 3.0, neutral, and 4.0, competent. County Extension Directors reported means below 3.0 on four competencies: "analyzing survey data," "interpreting statistical data," "identifying sources of statistical data," and "entering survey data into spreadsheets," as shown in Table 1.

The second objective in this study was to describe in-service needs of County Extension Directors in the area of needs assessment based on a weighted discrepancy model. Table 2 contains the rank order of skills based on the mean weighted discrepancy (MWD) calculated using importance ratings and competence ratings from County Extension Directors. The MWD's ranged from 0.80-3.45. "Entering survey data into spreadsheets," had the highest MWD ($M = 3.45$), while "identifying appropriate advisory group members," had the lowest MWD ($M = 0.80$).

The third objective in the study was to describe County Extension Directors perceptions of the benefits of needs assessment. County Extension Directors strongly agree that needs assessment enables them to "identify necessary changes for future programs" ($M = 4.20$). County Extension Directors agree least ($M = 3.30$) that "needs assessment work leads to opportunities to present posters, speak at conferences, or publish articles," and "needs assessment expands funding opportunities".

The fourth objective in the study was to describe County Extension Directors perceptions of the implementation of needs assessment. County Extension Directors agree overall that they "use needs assessment for external audiences and program improvement" (*M* = 3.77). County Extension Directors rated overall that "they do not lack an understanding of effective needs assessment practices" (*M* = 2.25), as shown in Table 3.

The fifth objective in the study was to describe County Extension Directors perceptions of their use of needs assessment results. County Extension Directors agree overall that they often "use needs assessment to make decisions about planning" (*M* = 3.38). County Extension Directors rated that they sometimes "use needs assessment to secure funding from stakeholders" (*M* = 2.34), as shown in Table 4.

The sixth objective of this study was to describe the relevance of demographics in program of focus among as it pertained to needs assessment. For the importance of needs assessment within program of focus area, ANR Agents rated "constructing an on-line survey" below 3.00 (*M* = 2.79). For the competence of needs assessment, ANR County Extension Directors perceived 8 of 15 skills with means below 3.00. Family and Consumer Sciences County Extension Directors perceived 5 of 15 skills with means below 3.00. 4-H County Extension Directors rated 5 of 15 skills with means below 3.00. Generalist County Extension Directors rated 1 of 15 skills below 3.00. For the implementing of needs assessment within the program of focus areas, ANR County Extension Directors reported that "they felt they were not rewarded for their needs assessment efforts" (*M* = 3.29). FCS County Extension Directors reported that "they lack extensive training in needs assessment techniques" (*M* = 3.00), "were not rewarded for their needs assessment efforts" (*M* = 3.08), and "felt support for implementing needs assessment is lacking from administration" (*M* = 3.58). Generalist County Extension Directors reported that "they lack extensive training in needs assessment techniques" (*M* = 3.00), "do not have time to carry out needs assessment projects" (*M* = 3.10), and "felt support for implementing needs assessment is lacking from administration" (*M* = 3.00).

The means for using needs assessment results by program of focus areas. ANR County Extension Directors rated 9 of the 11 skills with means below 3.00: "improve the quality of my county programming" (*M* = 2.95), "improve my instructions" (*M* = 2.74), "improve clientele well-being" (*M* = 2.84), "report progress on annual reports" (*M* = 2.89), "secure funding from stakeholders" (*M* = 2.29), "meet statewide mandate" (*M* = 2.71), "gain recognition for quality programs" (*M* = 2.47), "market programs to potential clientele" (*M* = 2.76), and "verify that the needs assessment process itself has supplied the necessary information" (*M* = 2.71). FCS County Extension Directors rated 5 of 11 skills means below 3.00: "secure funding from stakeholders" (*M* = 2.25), "meet statewide mandate" (*M* = 2.75), "gain recognition for quality programs" (*M* = 2.42), "market programs to potential clientele" (*M* = 2.92), and "verify that the needs assessment process itself has supplied the necessary information" (*M* = 2.75). 4-H County Extension Directors rated 6 of 11 skills with means below 3.00: "improve my instructions" (*M* = 2.75), "improve clientele well-being" (*M* = 2.50), "meet statewide mandate" (*M* = 2.50), "gain recognition for quality programs" (*M* = 2.25), "market programs to potential clientele" (*M* = 2.75), and "verify that the needs assessment process itself has supplied the necessary information" (*M* = 2.75). Generalist County Extension Directors rated 6 of the 11 skills with means below 3.00: “improve my instructions” (*M* = 2.90), “improve clientele well-being” (*M* = 2.70), “secure funding from stakeholders” (*M* = 2.40), “meet statewide mandate” (*M* = 2.80), “gain recognition for quality programs” (*M* = 2.50), and “market programs to potential clientele” (*M* = 2.90).

The seventh objective was to determine the knowledge and usage of the SEAL Curriculum. A total of 63 County Extension Directors responded to the question, “Have you participated in the SEAL Training?” Twenty-two County Extension Directors responded that they had participated in the SEAL Training, and 41 reported they did not participate in the training. One County Extension Director did not respond to the question. A total of 42 County Extension Directors responded to the question, “Would you like to participate in SEAL Training?” Twenty-two said yes they would like to participate in SEAL Training, and 20 would not like to participate in the training. Twenty-two did not respond to the question. A total of 22 County Extension Directors responded to the question, “Have you used SEAL Curriculum with advisory committees?” Eighteen reported that they have used the SEAL Curriculum, 4 reported they have not used the SEAL Curriculum and 42 did not respond to the question. A total of 18 County Extension Directors responded to the question of How useful did you find the SEAL Curriculum? One said it was not useful at all, 10 said it was somewhat useful, 5 reported it was very useful, and 2 said it was extremely useful and 42 did not respond to the question, “Do you need additional training on the SEAL Curriculum”, eight reported they needed additional training on the SEAL Curriculum. “Do you need additional copies of the SEAL Curriculum”, ten reported they did not need additional copies of the SEAL Curriculum. The seventh objective in the study was to determine the knowledge and usage of the SEAL Curriculum. A total of 42 County Extension Directors responded to the question, “Would you like to participate in SEAL Training?”

Table 1

Needs Assessment by Competence

Questions	N	Mean	SD
Identify appropriate advisory group members.	64	4.08	.84
Set needs-based priorities for programming.	64	3.75	1.05
Train advisory groups on observation of local needs.	64	3.61	1.00
Develop an action plan to improve a need.	64	3.59	1.08
Use a focus group to identify needs.	64	3.55	1.14
Write survey questions.	64	3.41	.92
Establish a benchmark for a need.	64	3.22	.97
Construct a mail survey.	64	3.20	1.06
Construct an on-line survey.	64	3.20	1.05
Use a case study to identify needs.	64	3.17	1.09
Access statistical data via the Internet.	64	3.00	1.08
Analyze survey data.	64	2.98	1.11
Interpret statistical data.	64	2.84	1.06
Identify sources of statistical data.	64	2.81	1.07
Enter survey data into spreadsheets.	64	2.78	1.24

Note: Overall mean = 3.28

The scale range was as follows: 1 = least competent, 2 = somewhat competent, 3 = neutral, 4 = competent and 5 = most competent.

Table 2

In-service Needs of County Extension Directors Based on MWD

Questions	N	MWD
Enter survey data into spreadsheets.	64	3.45
Interpret statistical data.	64	3.08
Identify sources of statistical data.	64	3.08
Analyze survey data.	64	3.00
Construct an on-line survey.	64	2.86
Establish a benchmark for a need.	64	2.48
Train advisory groups on observation of local needs.	64	2.28
Use a focus group to identify needs.	64	2.27
Access statistical data via the Internet.	64	2.17
Set needs-based priorities for programming.	64	2.03
Develop an action plan to improve a need.	64	1.94
Construct a mail survey.	64	1.27
Write survey questions.	64	1.25
Use a case study to identify needs.	64	1.24
Identify appropriate advisory group members.	64	0.80

Note: The Borich Needs Assessment Model, (1980).

Table 3

Implementation of Needs Assessment

Questions	N	Mean	SD
I use needs assessment for external audiences and program improvement.	64	3.77	.79
I am not rewarded for my needs assessment efforts.	64	3.14	.97
I feel that support for implementing needs assessment is lacking support from administration.	64	2.89	1.03
I do not have time to carry out needs assessment projects.	64	2.64	1.06
I lack extensive training in needs assessment techniques.	64	2.61	1.14
I don't have needs assessment resources such as training manuals and/or web resources.	64	2.53	.98
I think that needs assessment is too complex and difficult to implement.	64	2.31	.97
I lack an understanding of effective needs assessment practices.	64	2.25	.85

Note: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.

Table 4

Using Needs Assessment Results

Questions	N	Mean	SD
Make decisions about planning.	64	3.38	.63
Be accountable to stakeholders.	64	3.09	.68
Improve the quality of my county programming.	64	3.06	.71
Report progress on annual reports.	64	2.98	.77
Improve clientele well being.	64	2.89	.76
Improve my instructions.	64	2.86	.73
Market programs to potential clientele.	64	2.81	.81
Verify that the needs assessment process itself has supplied the necessary information.	64	2.78	.83
Meet statewide mandates.	64	2.72	.86
Gain recognition for quality programs.	64	2.45	.89
Secure funding from stakeholders.	64	2.34	.91

Note: Scale: 1 = Never, 2 = Sometimes, 3 = Often, and 4 = Always.

Conclusions

This section presents the conclusions based on the objectives of this study. The findings correlated to County Extension Directors only. Objective 1 - Describe County Extension Directors perceptions of importance and competence in needs assessment skills. County Extension Directors rated the 15 skills either most important or important. County Extension Directors perceived that needs assessment skills are important to their jobs as well as to State Extension Service. The County Extension Directors reported they were not competent in the following skills: "analyzing survey data, interpreting statistical data, identifying sources of statistical data, and entering survey data into spreadsheets". Training is needed to help alleviate the deficiencies. The skills noted are those which are in the initial stage in the Logic Model, which involves analyzing needs and assets, problem diagnosis and examining relevant research, knowledge and experience. Also, training provided to County Extension Directors on the Logic Model will help improve their competency as well as demonstrate the administration's desire to have more competent employees, as well as teach conceptual tools for planning, which the Logic Model displays.

Objective 2 - Describe in-service needs of County Extension Directors in the area of needs assessment based on a weighted discrepancy model. The Borich Needs Assessment Model confirmed that in-service training on needs assessment is effective and important. Training on the following should be conducted: "analyzing survey data, interpreting statistical data, identifying sources of statistical data, and entering survey data into spreadsheets".

Objective 3- Describe the County Extension Directors perceptions of the benefits of needs assessment. Overall, County Extension Directors believe that they acquire benefits from needs assessment. County Extension Directors rated theses statements neutral: "needs assessment efforts are valued in the promotion and tenure process, needs assessment work leads to opportunities to present posters, speak at conferences, or publish articles", needs assessment expands my opportunities", and "needs assessment helps me inform the clientele about my expectations". Witkin and Altschuld (1995), stated that resource allocation is an important part of organizational and community planning. They also make it known that a major function of policymakers and management is to decide where to put the organizations' resources, what programs or services to add, what to maintain, and what to cut back or delete. County Extension Directors need to be made aware of the funding opportunities and the impact needs assessment have on funding. Providing training on the SEAL Curriculum, Logic Model and Needs Assessment to County Extension Directors could change the perceptions of the benefits of needs assessment.

Objective 4 - Describe County Extension Directors perceptions of the implementation of needs assessment. County Extension Directors illustrated a positive perception in their ability to implement needs assessment. They disagreed with the most negative statements, demonstrating that they have the proper tools to effectively implement needs assessment. The two following statements were rated high: "I am not rewarded for my needs assessment efforts" ($M = 3.14$), and that "support for implementing needs assessment is lacking support from administration" ($M = 2.89$). Administrators should look at the personnel evaluation instrument to evaluate the means of supporting County Extension Directors to change their perceptions. The result of County Extension Directors responses to their ability to implementing of needs assessment has indications that training is essential. In 1997, Seevers, Graham, Gamon, & Conklin state that after identifying community needs, implementation is the next phase in the process. This process is very important, it is essential that Mississippi County Extension Directors understand how to implement needs assessment. This situation can be alleviated by providing in-service to County Extension Directors on needs assessment.

Objective 5-Describe the County Extension Directors perceptions of their use of needs assessment results. County Extension Directors rated the following skills between 2.98-2.34: "reporting progress on annual reports," "improving clientele well being," "improving my instructions," "marketing programs to potential clientele," "verifying that their needs assessment process itself has supplied the necessary information," "meeting statewide mandates," "gain recognition for quality programs", and "securing funding from stakeholders". This reiterates that County Extension Directors need training on the importance of needs assessment to State University Extension Service. Needs assessment is a critical element of effective extension programming and one of the key components of extension work. Information gathered from evaluations is critical for documenting program impact, making changes for future programs, and identifying additional goals and objectives for future programming (Seevers et al., 1997).

Objective 6- Describe relevance of County Extension Directors demographics among program of focus areas as it pertained to needs assessment. There was very little difference among program of focus areas in the assessment. The training needs noted in the competence areas should be taught to the entire group, and no one program area should be singled out. The SEAL Curriculum could be one of the baseline training modules provided to the County Extension Directors which will improve their knowledge base, and enhance their competence in need assessment, as well as equip them with the skills to adequately perform the duties of a County Extension Director according the State Extension Service Restructuring Plan, 2002. The lessons within the SEAL Curriculum are geared toward improving advisory boards, but can also be used as a teaching mechanism to train extension personnel. The assessment of the County Extension Directors coincided with what other researchers have recorded, such as Rossi, Freeman, & Lipsey (1999). The researchers, Rossi et al., (1999), stated that the fundamental need of a program cannot be effective at ameliorating a social problem if there is no problem to begin with or if the services provided do not actually relate to the problem. Rossi et al., (1999), also reported that needs assessment is a systematic approach to identifying social problems, determining their extent, and accurately defining the target population to be served and their need. Using needs assessment has been a common practice in program planning for Cooperative Extension Service (Mallilo, 1990). Witkin and Altschuld (1995), stated "needs assessment is conducted to derive information and perception of values as a guide to making policy and program decisions that will benefit specific groups of people" (p. 6).

Objective 7- Determine the knowledge and usage of Strengthening Extension Advisory Leaders Curriculum. The responses were low in this area because 41 of the County Extension Directors reported that they have not participated in the SEAL training. When the question was asked, "Would they like to participate in the SEAL training," 22 reported they would like to participate in the training, which means 52% of the responders would like to participate in SEAL training. Since there is an interest in the training, the SEAL Curriculum should be offered as an in-service training to County Extension Directors. Also, since County Extension Directors have numerous responsibilities, which are revealed in the State Extension Service Restructuring Plan, 2002. The word "need" is mentioned ten times in the job duties and responsibilities, of the County Extension Directors. Needs assessment is important to the Mississippi State University Extension Service programming.

Recommendations

Based on the conclusions, there are several recommendations that were derived:

1. Provide in-service training on the Logic Model and Strengthening Extension Advisory Leaders Curriculum for Area Agents, Specialists, and 4-H Youth Agents, but make it a requirement for County Extension Directors.
2. Individuals who are interested in becoming a County Extension Director should receive credit if they have completed the SEAL Curriculum training.
3. Require current and new employees to attend SEAL and Logic Model in-service training within six months of assuming the role of County Extension Director.
4. Conduct an in-service training for Extension Staff on needs assessment and the role it plays within the State Extension System.
5. Provide an updated training on the SEAL Curriculum and Logic Model to administrators so they can be more effective in evaluating County Extension Directors in the area of needs assessment.
6. Provide in-service training on the SEAL Curriculum and the Logic Model to new Extension Professionals during the first year.
7. The Personnel Evaluation instrument should be revised to include needs assessment outcomes.
8. Use the Borich Needs Assessment Model as a model to determine in-service training needs in other program areas of focus.
9. Reinforce that County Extension Directors use the SEAL Curriculum to train advisory leaders.

Suggestions for Further Research

The following research suggestions were derived from this study:

1. Further research should be conducted to assess the perceptions of 4-H Youth Agents, Area Agents, and Specialist on needs assessment.
2. Further research should be conducted to find out how the other Southern States are using the SEAL Curriculum.

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Evaluating the Influences on Extension Professionals' Engagement in Leadership Roles

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Abstract

Developing leadership within any type of volunteer organization can be a difficult task; however fostering commitment long term has been a proven key component to the sustainability of such organizations (Collins, 2001). Extension professionals rely heavily on their professional organizations to offer stability and professional development on a national basis, thereby strengthening the extension profession as a whole. Within the 4-H youth development field, this stabilizing organization is the National Association of Extension 4-H Agents (NAE4-HA). While over 1,200 extension 4-H professionals gather annually to engage in organizational activities at their national meeting, the board has found it increasingly more difficult to recruit and retain leadership at the national level. Previous research shows in order for volunteers to partake in leadership opportunities they must feel the benefits outweigh the costs (Inglis, 1994). In order to further understand the membership and determine their motivations a Delphi study was conducted to determine why the current NAE4-HA leadership team chose to step up and lead. As a result, professional development and recruitment efforts were suggested to assist in developing NAE4-HA leaders for the future, essentially enhancing leadership development within Extension professionals themselves and the communities they serve.

Introduction

The vision of the National Association of Extension 4-H Agents (NAE4-HA) is "to be the first choice of the youth development professional for building professional and personal competencies" (NAE4-HA, 2010). 4-H is the youth serving organization of United States Department of Agriculture and Cooperative Extension (NIFA, 2010). 4-H provides agricultural and family and community sciences education to youth 5-18 years old across the United States through non-formal and formal educational opportunities (Rasmussen, 1989). NAE4-HA is the professional organization of the 4-H Youth Development profession, offering networking and professional development opportunities.

Members serve as the governing body of the association in a volunteer capacity. The board is responsible for managing financial, communication, and professional development aspects of the association. All of these aspects are critical to keeping the association in place. Every year the Organizational Stewardship committee, responsible for recruiting new leadership, struggles to fill these voluntary roles, why? This study examined why individuals currently in leadership positions within NAE4-HA chose to take the additional responsibilities associated with leading the association.

Fostering new leadership within an organization will aid the performance of an organization (Barnes, Haynes, & Woods, 2006), while building and strengthening the leadership and decision making skills of leaders within an organization. This aids in sustaining that organization over the long-term (Collins, 2001). The National Institute of Food and Agriculture (NIFA) and Cooperative Extension, as the over-arching organizations of NAE4-HA, have demonstrated continued commitment to professional development opportunities for Extension professionals which helps build competencies across the system (Stone & Bieber, 1997). Extension professionals look to these organizations for competency building and networking opportunities. The Association of Natural Resource Extension Professionals (Jackson et al., 2004) surveyed their membership to determine why they chose to be a part of the organization. They indicated a need to belong to an organization with members of similar interests and networking opportunities as the primary reasons to belong.

Rogers (2005) determined motivation of teachers to move into leadership roles to be structured around the need to achievement, affiliation, and esteem. Inglis (1994) looked at the needs of volunteers who serve on boards and found that if the individual perceives a benefit that outweighs the demand of being a part of that board they will continue to serve. Fritz et al. (2000) found that 4-H volunteers chose to volunteer because of their strong affiliation to the program.

The National Research Agenda: Agricultural Education and Communication, 2007-2010 outlines clearly the need for developing and disseminating effective leadership education programs, RPA 1, within Agricultural Leadership (Osborne, n.d.). Professional organizations are safe environments for Extension professionals to take part in leadership education opportunities. Association leadership also addresses Agricultural Education in Domestic and International Settings: Extension and Outreach RPA 2 (Osborne). Professional competencies that prepare 4-H Agents to be successful agents of change can be developed and implemented through leadership within the association (Rogers, 2003).

Theoretical Framework

The area of volunteer leadership has grown more important as organizations embrace ways to recruit and retain members to serve in leadership roles. One particular area which serves a measure for understanding why members elect to serve in leadership roles is motivational theory. While there are many viewpoints of motivation the intent of this study was to determine motivation related to the purposive approach. The purposive approach addresses motivational needs based upon the goal-directed nature of behavior (Beck, 1990).

There are a number of motivational theories which have been used to address volunteer needs in non-profit organizations (Connors, 1995). These include Expectancy Theory (Vroom, 1964), Maslow's Hierarchy of Needs (Maslow, 1943), and Herzberg's Two-Factor Model (Herzberg, Mausner & Snyderman, 1959). All of these theoretical approaches to understanding motivation and need were derived from the broad purposive perspective.

Learned Needs Theory

From the purposive perspective, McClelland (1967) developed the learned needs theory. McClelland's approach identified three central routes to motivation: achievement, power, and affiliation. His work sought to, "explain and predict behavior and performance based on a person's need for achievement, power and affiliation" (Lussier & Achua, 2010, pg. 42). This unconscious process drives individuals to make choices about their behavior. McClelland postulates that each person has each of the three motivational needs, but can vary by degree based upon environmental (nurture) experiences.

The Need for Achievement

The motivational need associated with achievement stems from an individual's desire (or concern) for excellence. Excellence is typically derived from personal accomplishments. Of the three needs, achievement is the most researched (Connors, 1995). With that, assessment of individuals scoring high in achievement provides important information about their behavior. Connors (1995) speculates that individuals with high achievement needs will: (a) set goals just difficult enough to maintain a sense of challenge and achievement, (b) seek feedback to measure success and increase the quality of their personal performance, and (c) will avoid routine and seek other new challenging tasks to make progress toward.

In terms of voluntary contributions high achievement individuals will take on responsibilities in which they have the opportunity to be successful and recognized. According to Connors (1995, p. 27) these include, but are not limited to "fundraising, membership campaigning, researching and analyzing, reporting, chairing committees or occupying leadership positions, filling executive directorships, and doing nitty-gritty work."

The Need for Power

This motivational need is derived from an individual's desire for power described as, "the unconscious concern for influencing others and seeking positions of authority" (Lussier & Achua, 2010, p. 42). Individuals with high power scores are often seen as wanting to be in control of a situation or people and they typically enjoy competition, not necessarily for a personal satisfaction of achievement (high achievement) but to win. They are comfortable confronting others and do not shun away from conflict. They enjoy positions of authority and status.

According to Connors (1995) individuals with power seek to surround themselves with symbols associated with power and will often find ways to call attention to themselves. With that, volunteer-related duties and responsibilities should include tasks which can fulfill this need. These may be "public speaking, fund-raising, writing newspaper articles, being a CEO, chairing events that bring public attention to a cause, or managing many people" (Connors, p.28).

The Need for Affiliation

An individual's need for affiliation is often reflected in a subconscious need to develop or maintain close relationships (Lussier & Achua, 2010). There are two distinct forms of this behavior, need for affiliation and need for intimacy. High affiliation individuals are characterized as highly sensitive and have a strong need to be liked by others. The activities they seek out are often associated with developing, helping or teaching others. Connors (1995, p. 28) provided that need for affiliation also manifests in desires related to forming "alliances and partnerships with individuals or groups."

High affiliation individuals can be characterized as needing and seeking approval from others, confident, assertive, enthusiastic, and expressive. Additionally, they are hesitant to seek feedback or evaluation from others (fear of disapproval). Those with a need for intimacy are conversely considered to be warm, sincere, appreciative, less dominant and self-centered and will often get involved in “deeper relationships” (Connors, 1995, p. 28).

In this case volunteer-related activities will differ based upon a person’s distinction between need for affiliation or need for intimacy. For those with high need for affiliation the following responsibilities are recommended: “ushering, task force membership, hospitality committee, banquet committee,…, social activity worker” (Connors, 1995, p. 29). Those with high need for intimacy may be involved with, “recognition events, case worker, friendly visitor, or counselor” (p. 29).

There is a distinct need for being able to recognize an individual’s needs and motivations. As organizations become more adept at doing so, members will feel more fulfilled by their personal involvement. This involvement is crucial to creating opportunities for members to move through the organization and take on additional leadership roles either as a chair of committee or executive office.

Purpose and Objectives

The purpose of this study was to develop a consensus listing of influences leading to extension professionals engaging in leadership positions in professional extension organizations. The objective of the study was to use this consensus to create a plan for leadership recruitment by professional extension organizations. An expert panel of 29 extension professionals from 20 different states was used to reach the objectives of this study.

Methods

The Delphi method is a process developed by Dalkey and Helmer (1968) designed to collect knowledge and create a consensus on a topic from a group of experts specializing in the area of interest (Ziglio, 1996). This study employed the conventional Delphi version identified by Wilhelm (2001) and outlined by Stitt-Gohdes and Crews (2004). The first step was to select the expert panel to serve as the purposive sample. In this study, the panel consisted of 29 extension professionals serving as the leadership team for NAE4-HA. While this may appear to be a small sample size, it is acceptable when using the Delphi method. Quality results have been created out of panels with only 10-15 participants (Linstone & Turoff, 1975).

The Delphi method has been noted as an effective way to obtain consensus with a purposive sample of experts (Stufflebeam et al., 1985). It is also conducive to gaining insight into priorities that are difficult to analyze analytically from those with the needed information (Dalkey & Helmer, 1968). In this case, the individuals with the needed information were those currently participating in leadership roles in a professional extension organization. The NAE4-HA leadership team was chosen for the study because 4-H professionals represent all categories of programmatic expertise within extension: agriculture, family and consumer sciences, horticulture, natural resources, and community development. These professionals often have responsibilities in outside areas along with their youth development appointment. The extension professionals chosen to run for and hold professional leadership positions within this organization must be nominated or approved by their state extension director. State extension directors can only nominate/approve professionals they feel have leadership potential and fulfill the goals of NAE4-HA: meet the needs of youth development professionals by maximizing the use of technology; provide progressive levels of professional development; elevate the quality of youth development work through scholarship, research and practice; advocate for the 4-H youth development profession; and facilitate networking throughout the association and the youth development profession. The need for informed opinion on the topic at hand is imperative to the success of a Delphi study (Wicklein, 1993).

Following the Delphi method (Moore, 1987), the study consisted of three questionnaires, given in three stages. The first round used one open-ended question, "What were the main influences leading you to run for and take an office in a professional extension organization?" This question was used to generate multiple responses from the study participants. The initial responses were collected, summarized, and categorized by the researchers for the creation of the questionnaire used for the second round.

In round two, the panel members were asked to rate their level of agreement with the items categorized in the first round. An instrument was created using the responses from round one with each statement collected being rated on a Likert-type scale (1-Strongly Disagree, 2 – Disagree, 3 – Uncertain, 4 – Agree, 5 – Strongly Agree). A mean score ≥ 3.50 was set *a priori* for the item to continue to the third round.

The third round was used to determine consensus among the remaining items. Consensus was assumed to be reached when agreement was indicated by a certain percentage of panel members (Scheibe, Skutsch, & Shofer, 1975). A percentage of 66% was set *a priori*. The final questionnaire consisted of the items passing the second round ratings. Panel members were asked to indicate their agreement with each statement. If they disagreed with a statement, they were asked to provide open-ended comments explaining why they could not agree. All 24 in this round reached consensus. Most Delphi studies reach consensus in the third round (McCampbell & Stewart, 1992).

Descriptive statistics were used to analyze all data collected. Data collected in round two (Likert-type questions) were treated as interval data to report means and standard deviations for selection purposes. Percentages were used to report nominal data collected in the third round to report frequencies.

Results

A 100% response rate was achieved in the first two rounds because all participants in the study responded in these portions of the study. An 80% response rate was achieved in the third round due to several participants being unavailable. Forty-five influences were identified by the participants in Round One. Table 1 lists the influences identified by more than two participants.

The variety of influences identified dealt with personal, professional, and organizational influences pertaining to taking on a leadership role.

Table 1
Round One: What were the main influences leading you to run for and take an office in a professional extension organization (n = 29)

Influences	Responses[a]
To give back to the association	10
I was asked	9
I believe participation in leadership is a part of my role as a member	5
Networking	4
The respect I have for colleagues who have served the association prior to my service	3
To grow my skills as a leader	3
I wanted to learn about the inner workings of the organization	3

[a]Influences identified by only one or two participants are not included in this list, but were included in Round Two.

Of the 45 influences identified on the Round Two questionnaire, 24 were retained for the third round. The means for the items ranged from 2.07 to 4.48 (see Table 2). The highest level of agreement ($M = 4.48$) was reached on "to give back to the association." The next six highest rated items were influences related to service including making a difference, contributing to the profession, and believing it is important to get involved when you believe in the organization.

Table 2
Round Two: Level of Agreement on Influences (n = 29)

Influence	*M*	*SD*
To give back to the association	4.48	0.58
To make a positive difference	4.41	0.68
To contribute to the association	4.28	0.75
I have a passion for 4-H	4.25	0.93
I want to give back to the extension organization	4.25	0.70
I think it is important to get involved in organizations I believe in	4.10	0.77
To contribute to the profession	4.07	0.65
I was encouraged by others to serve	4.07	1.00
For personal growth	4.04	0.78
I believe participation in leadership is a part of my role as a member	4.03	0.78
I have a vested interest in the association	3.93	0.88
My belief in the mission and vision of NAE4-HA	3.86	0.92
I was asked	3.79	1.15
The respect I have for colleagues who have served the association prior to my service	3.72	1.16
For personal fulfillment	3.72	0.70
I enjoy being part of a team	3.71	0.90
I felt I had something to bring to the association	3.69	0.93
To grow my skills as a leader	3.69	0.81

I believe it is important to actively participate in all roles within extension which includes professional association work	3.68	1.02
I wanted to be challenged	3.61	1.07
I wanted to step up to lead	3.57	1.03
Networking	3.57	1.03
To help others grow and develop as professionals	3.55	0.99
I get personal satisfaction in professional participation	3.50	0.96
For personal achievement	3.48	1.06
I love professional development at the national level	3.46	1.04
I felt it was a professional obligation	3.36	1.22
I felt a responsibility to help lead the profession at the national level	3.36	1.06
I enjoy meeting people from around the country	3.21	1.00
To be a role model for younger agents	3.21	0.94
I wanted to make the association more efficient	3.21	0.92
I was encouraged to run based on my skills	3.14	0.99
I was interested in the topic area of the position	3.07	1.26
To test my leadership abilities	3.07	1.09
It was the right time for me to serve on the board	3.07	1.02
I want to build self confidence in leading others	3.04	1.00
I wanted to learn about the inner workings of the organization	3.00	1.36
I want to learn more about the organization so I can help others	3.00	0.90
I enjoyed a similar role at the state level	2.86	1.35
I have had past positive experiences on a conference committee	2.79	1.26
I wanted peer support and encouragement	2.57	0.96
For packet enhancement (promotion)	2.29	1.46
At a state association meeting our president handed out a quote that stuck with me “if not now, when? If not me, Who?”	2.29	1.21
I am interested in public relations	2.28	1.03
My state 4-H leadership asked me to run	2.07	1.25

The twenty-one items not retained for Round Three were below the *a priori* set level of agreement needed to be retained. Variability within these items existed as indicated by the high standard deviations. Round Two standard deviations ranged from a low of 0.58 for “to give back to the association” (M = 4.48) to a high of 1.46 on “for packet enhancement (promotion)” (M = 2.29). These ranges may be due to extension system differences across states.

In Round Three, participants were asked to provide a dichotomous indication of whether or not they agreed with the 24 items retained from Round Two. If a participant was not in agreement with a statement they were encouraged to explain this disparity. All 24 items included in Round Three reached the *a priori* set level of agreement and were deemed a consensus (see Table 3). 100% agreement was reached on nine of the influences. These items included wanting to give back to the Extension organization and the association, contributing to both NAE4-HA and the youth development profession, their belief in the mission and vision of NAE4-HA, and feeling it is important to get involved in organizations they believe in. Additional influences reaching 100% agreement included wanting to make a positive difference, their passion for 4-H, and the enjoyment they get from being part of a team.

Table 3
Round Three: Level of Agreement with Recommendations (n = 23)

Influence	Agreement %
I want to give back to the Extension organization	100.0
To give back to the association	100.0
To contribute to the youth development profession	100.0
To contribute to the association	100.0
My belief in the mission and vision of NAE4-HA	100.0
I think it is important to get involved in organizations I believe in	100.0
To make a positive difference	100.0
I have a passion for 4-H	100.0
I enjoy being part of a team	100.0
I have a vested interest in the association	95.7
I believe participation in leadership is a part of my role as a member	95.7
I was encouraged by others to serve	95.7
I was asked	95.7
I get personal satisfaction in professional participation	95.7
Networking	95.7
For personal fulfillment	91.3
For personal growth	91.3
The respect I have for colleagues who have served the association prior to my service	91.3
To help others grow and develop as professionals	91.3
I believe it is important to actively participate in all roles within extension which includes professional association work	91.3
I wanted to step up to lead	91.3
I felt I had something to bring to the association	87.0
To grow my skills as a leader	87.0
I wanted to be challenged	73.9

Conclusions

Prior to beginning this study there was limited information on why 4-H extension professionals choose to lead. Studies have indicated 4-H volunteers lead because of their strong connection to the program or affiliation (Fritz, 2000). A Delphi study approach was used to develop a clearer picture of why board leadership in NAE4-HA chose to lead through their individual descriptions. After consensus was reached on the study the results were categorized based on learned needs as seen in table four (McClelland, 1967). All three learned needs were clearly represented in the results.

Table 4
Results Categorized

Need for Affiliation	**Need for Achievement**	**Need for Power**
To give back to the	I think it's important to get	I have a vested interest in the

association	involved in organizations I believe in	association
I want to give back to the Extension organization	To make a positive difference	I believe participation in leadership is a part of my role as a member
To contribute to the youth development profession	I get personal satisfaction in professional participation	I wanted to step up to lead
To contribute to the association	Networking	I felt I had something to bring to the association
My belief in the mission and vision of NAE4-HA	For personal fulfillment	
I have a passion for 4-H	For personal growth	
I enjoy being a part of a team	I believe it is important to actively participate in all roles within extension which includes professional association work	
I was encouraged to serve	To grow my skills as a leader	
I was asked	I wanted to be challenged	
The respect I have for colleagues who have served the association prior to me		
To help others grow and develop as professionals		

Need for affiliation had the strongest representation with 11 statements relating to the specific need. A strong affiliation need shows board members identify strongly with the association and have a strong desire to develop beneficial relationships within the group. Need for achievement had nine indicators as a result of the study. This shows a concern for excellence. Members of the board who have a high need for achievement may set goals that will challenge themselves and seek feedback to increase their performance (Connors, 1995). Finally, the need for power had four indicators. This need was expressed by the board due to a concern for influencing others and looking for positions based on the impact they may have on the organization (Lussier & Achua, 2010).As a result, it was concluded that the NAE4-HA board chose to lead as a result of their need for affiliation, achievement and power with the strongest needs being affiliation and achievement.

Implications

While recruiting volunteers to serve in leadership roles is a challenge faced by professional organization at all levels, it is essential to recognize choosing to volunteer is a personal decision. Previous research has indicated motivations for volunteering are often related to the connection the individual feels towards the organization (Fritz, 2000). This is further emphasized by this study, showing the need for affiliation is the most important reason why professionals have chosen to take on leadership roles within NAE4-HA. Current leadership or committees charged with recruitment efforts need to consider this need when preparing strategies for recruitment and professional development opportunities designed to encourage members to move into new leadership roles.

Given that affiliation is the strongest need indicated in this study some strategies for recruitment can include bringing in prior leaders to the table to coach and encourage potential candidates to step into leadership roles. Also providing social interactions with current leadership and potential candidates will model behavior to members and offer networking opportunities that may break down current barriers.

Strategies in relation to the need for achievement may include setting clear goals for leadership in advance of recruitment strategies. These goals should include opportunities for member feedback and recognition when goals are met. Recognition may include membership outside the board that contributed to reaching set goals. This additional layer of recognition could aid in "sparking" interest in leadership opportunities from within membership.

As a result of this study associations can begin to understand why individuals have made the decision to volunteer and begin to address barriers to service. If affiliation and achievement are the strongest motivators for service then recruiting potential leadership candidates along those needs may prove very helpful.

Recommendations

If lack of leadership within professional extension organizations is going to be addressed, it is essential that recruitment efforts be focused on making connections between the needs and motivations of those choosing to take on leadership roles and new members. For organizations to succeed and remain tangible, focusing on building and strengthening the leadership and decision making skills of new leaders within the organization is necessary (Collins, 2001).

Gaining an understanding of the reasons individuals choose to lead will assist associations in determining where to target their recruitment efforts. Given that affiliation is the strongest need indicated in this study, strategies need to include establishing strong bonds between past and future leaders. For example, coordinating sessions where prior leaders can coach and encourage potential candidates to step into leadership roles, explaining the process and dedication the organization has to its members could provide an environment where people will begin to feel connected. In addition, providing social interactions between current leadership and potential candidates where they can model leadership behavior to members and offer networking opportunities that may break down current barriers could also be helpful. Any opportunities where members feel welcomed and part of the organization and leadership team, rather than disconnected and separate should be taken advantage of.

It is also recommended, as a result of this study, that research be directed at those who have chosen not to take on leadership roles in order to further discover the barriers to service. The information uncovered by this Delphi study in conjunction with identified barriers may help further solidify how individuals make choices regarding leadership. In addition, replicating this research in other professional extension organizations may help further define motivations and provide deeper insights in to recruitment and retention.

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Entry-level Technical Skills that Agricultural Industry Experts Expect Students to Learn through Participation in the Supervised Agricultural Experience Component of Secondary Agricultural Education: A Delphi Study

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Abstract

The National Research Council's (NRC) Report (1988), Understanding Agriculture: New Directions for Education, called on secondary agricultural education to shift its scope and purpose, including students' supervised agricultural experiences (SAEs). The NRC asserted that this shift should create opportunities for students to acquire supervised experience in land laboratories, agricultural mechanics laboratories, greenhouses, nurseries, and other facilities provided by schools. For example, the agricultural industry offers 52,000 job opportunities annually, including sales and marketing, specialty veterinary medicine, food safety/biosecurity, forest ecosystem management, precision agriculture, biomaterials engineering, landscape horticulture, plant and animal genetics, specialty crops production and nutrition services (Goecker, Gilmore, Smith, & Smith, 2005). Students' SAEs should reflect such aspects of the industry. Using a modified Delphi technique, this study identified the perceptions of agricultural industry experts on the role of SAE in facilitating students learning technical skills needed for entry-level employment. The experts expected that students would learn more entry-level technical skills associated with the career pathways of Animal Science and Agricultural Communications (44 of 60) than the other five pathways combined as a result of their participation in SAEs. This paper explores rationale regarding why it is important to address this "imbalance" and makes recommendations about that.

Introduction and Conceptual Framework

SAE is the part of agricultural education that allows students to practice in a work setting (placement) or an entrepreneurial (ownership) environment what they have learned in the classroom or laboratory (Talbert, Vaughn, Croom, & Lee, 2007). These work-based learning experiences are a component of agricultural education that sets it apart from many other programs or subjects in most secondary schools.

Roberts and Ball (2009; Figure 1) reported that a review of early secondary agricultural education curricula (i.e., Stimson, 1920) revealed its focus was on the development of specific skills. This behaviorist framework for content-centered secondary agricultural education has been the foundation for much of its curriculum (Phipps, Osborne, Dyer, & Ball, 2008; Talbert et al., 2007), which has focused on preparing skilled workers for the industry of agriculture.

SAE is one of the critical components of secondary agricultural education's "three-circle" model of program delivery. Agricultural education's proponents have touted the benefits of this critical component of the program because it includes acceptance of responsibility, development of self-confidence, opportunity to learn independently, development of independence, and learning to work with others as student learning experiences (Pals, 1988). In so far as students developing favorable work attitudes, Dyer and Williams (1997) spoke to the knowledge and skills students acquire in that regard through SAE placement opportunities particularly.

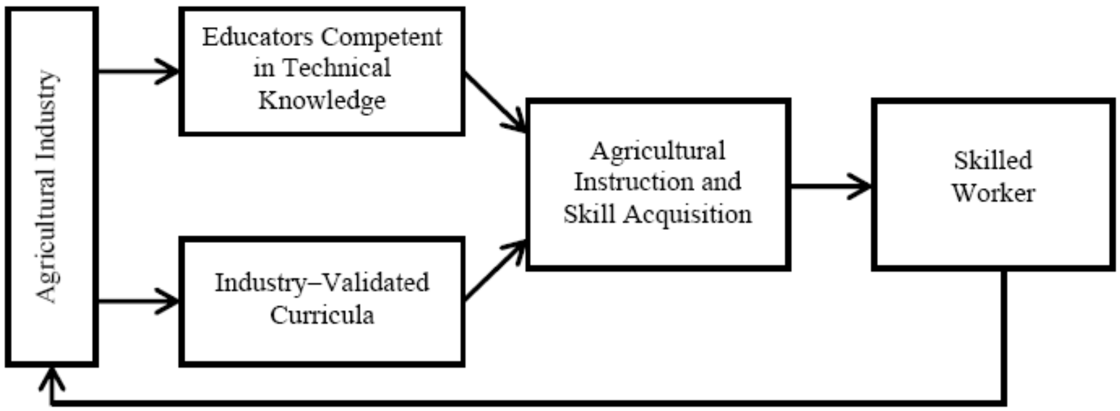

Figure 1. A content-based model for teaching agriculture (Taken from Roberts & Ball, 2009)

The abovementioned content-based model of teaching agriculture would resonate with the early proponents of vocational education. Stimson's project method of teaching and Prosser's focus on industry specific training can be found in both the "industry-validated curricula" and the emphasis placed on "agricultural instruction and skill acquisition" (Roberts & Ball). Regarding a model of secondary agricultural education that focuses on the "melding" or integrating of classroom and laboratory instruction, youth development, and experiential learning, an observer can identify easily the opportunity for skill acquisition occurring through secondary agricultural education's hallmark experiential learning component, supervised agricultural experience.

However, the decline in delivery of this facet of the model (Baggett-Harlin & Weeks, 2000; Dyer & Osborne, 1995; Steele, 1997) has implications regarding agricultural education's role in the preparation of students for entry-level positions in the agricultural industry. For example, the skills being learned may not be congruent with today's agricultural industry standards. This discrepancy may be contributing to a decline in students participating in SAEs. However, little is known about reasons for that "decline," especially from an empirical perspective.

Today's workplace reflects the many changes that have occurred over the past century, from emergence of the information age to the shift to a global economy; accordingly, the workplace requires a different set of skills (Ruffing, 2006). The career cluster Agriculture, Food and Natural Resources (AFNR) consists of seven career pathways that can be used to facilitate students acquiring the skills needed for entry-level employment in the 21st century (Oklahoma Department of Career and Technology Education, 2009; Ruffing, 2006). Federal lawmakers, through authorization of Perkins IV legislation, called for the development of "programs of study" at both secondary and post-secondary levels that would be aligned with industry-recognized standards. These "career pathways are programs of academic and technical study that integrate classroom and real-world learning organized around industry" (Hoachlander, 2008, p. 23). This study focused on the SAE component of the comprehensive model of agricultural education and its potential for facilitating students learning entry-level technical skills associated with the career pathways of the AFNR career cluster. However, if a primary purpose of secondary agricultural education is to prepare students for entry-level employment in the agricultural industry (Phipps et al., 2008), what is known about the views of individuals who may seek to employ the programs' graduates, especially regarding the role of students' SAEs and their job preparedness?

Purpose and Objectives

The purpose of this study was to describe the perceptions of a select group of agricultural professionals regarding the entry-level technical skills they expected students to learn through their participation in the SAE component of secondary agricultural education in Oklahoma. A modified Delphi technique was used to achieve this purpose. Accordingly, the following objectives guided the study:

1. Describe selected personal and professional characteristics of agricultural industry experts who comprised the study's Delphi panel.

2. Describe the perceptions of panelists regarding the SAE component of the secondary agricultural education model as related to the technical skill acquisition of students preparing for entry-level positions in the agricultural industry in Oklahoma, using the seven career pathways as an exploratory framework.

3. Suggest career pathways in which students should learn entry-level skills through participation in SAEs such that their job preparedness on entering the agricultural industry in Oklahoma is enhanced. Accordingly, Roberts' and Ball's (2009) content-based model for teaching agriculture would be expanded regarding its' relevance to students' SAEs.

Methods and Procedures

This was a descriptive study that employed a survey research design using the Delphi technique (Sackman, 1975). The Delphi technique is a widely accepted method for achieving convergence of opinion concerning real-world knowledge solicited from experts in certain topic areas (Hsu & Sandford, 2007). Linstone and Turoff (1975) characterized the Delphi technique as a communication process that is structured to produce a detailed examination of a topic/problem and discussion from the participating group (i.e., expert panel), but not one that forces a quick compromise. The purpose of the Delphi technique is to gather responses from an expert panel or panels and combine the responses into one useful statement or "position" (Stitt-Gohdes & Crews, 2004).

A review of the *Journal of Agricultural Education* from 2000 to 2006 revealed eight studies that relied on the Delphi technique to evaluate a variety of topics of importance to agricultural education researchers. To that end, the Delphi technique has been accorded a reasonable degree of acceptance; e.g., the technique has been used in the area of curriculum planning and the identification of personal qualities of student leaders (Martin & Frick, 1998). Regarding SAE, Camp, Clarke and Fallon (2000) used the Delphi technique to examine the efficacy and structure of SAE for the 21st century.

Purposeful sampling was used to select members for the study's expert panel. Creswell defined purposeful sampling as "a qualitative sampling procedure in which researchers intentionally select individuals and sites to learn or understand the central phenomenon" (p. 359).

This design allows for development of consensus on a number of issues without face-to-face confrontation (Helmer, 1966). According to Dalkey, Rourke, Lewis, and Snyder (1972), when a Delphi panel has at least 15 members and is truly representative of the expert community, the method is reliable. For this study, a panel of state experts, representing the agricultural industry in Oklahoma, was used.

The panel was comprised of experts (i.e., panelists) representing agricultural cooperatives, livestock production, livestock marketing, small grain production, small grain marketing, as well as other ancillary agribusiness entities in Oklahoma. All panelists were familiar with the entry-level technical skills expected for their sector of the agricultural industry. They either were or had been responsible for hiring entry-level employees. In addition, selected panelists were business and industry sponsors of the Oklahoma FFA Proficiency Award program. So, the panel included commodity groups as well as other agricultural sector leaders who represented the seven career pathways for agricultural education in Oklahoma (Table 1). The career pathways for AFNR (referred to as Agricultural Education in Oklahoma) include 1) Food Products and Processing (FPP), 2) Plant and Soil Science (PSS), 3) Animal Science (ANSI), 4) Agricultural Power, Structures and Technology (APST), 5) Agribusiness and Management (AGBMGT), 6) Agricultural Communications (AGCM), and 7) Natural Resources and Environmental Science (NRES) (ODCTE, 2009).

Table 1

Composition of the Study's Delphi Panel: Agricultural Industry Representation by Career Pathways

Industry Sectors	Career Pathways
Dairy Production	Food Products and Processing
Creamery (Dairy Processing)	Food Products and Processing
Retail Greenhouse	Plant and Soil Science
Small Grain Commodity Group	Plant and Soil Science
Livestock Market	Animal Science
Corporate Swine Farm	Animal Science
Livestock Association	Animal Science
Implement Dealership	Agricultural Power, Structures and Technology
Agricultural Lending Association	Agribusiness and Management
Electric Cooperatives	Agricultural Communications
Farm Cooperatives	Agricultural Communications
Soil and Water Conservation Service	Natural Resources and Environmental Science

Agricultural education faculty members at Oklahoma State University established both content and face validity for the initial instrument used in this study. One of the original researchers who developed the Delphi technique, i.e., Dalkey (1969), stated that reliability of .7

or greater could be achieved when the expert panel consisted of 11 members or more. After further use of the Delphi technique, Dalkey et al. (1972) indicated that a group size of 13 was needed for reliability with a correlation coefficient of .9. Therefore, Dalkey et al. recommended a group size of twelve to fifteen panelists. The initial inclusion of 17 industry experts as panelists contributed to the reliability of the multiple round, modified Delphi procedure used in this study.

Personal and professional characteristics unique to the panel of experts were collected: gender, age, years of professional experience, and highest degree earned. Regarding SAEs (or similar 4-H projects), their types, intensity of involvement, and panelists' perceptions of benefits to themselves was also of interest to the researcher. In all, eight items were asked regarding panelists' characteristics. Using the seven career pathways for agricultural education in Oklahoma as a context, panelists were asked to identify entry-level technical skills that should be learned through student participation in the SAE component of secondary agricultural education. In addition, the following explanatory paragraph was included on the round one instrument for the agricultural industry panelists.

> The Oklahoma Department of Career and Technology Education defines SAE programs as teacher-supervised, individualized, hands-on, student developed projects that give students real-world experience in agriculture and/or agriculture related areas (ODCTE, 2009). The seven career pathways for Oklahoma Agricultural Education include 1) Food Products and Processing, 2) Plant and Soil Science, 3) Animal Science, 4) Agricultural Power, Structures and Technology, 5) Agribusiness and Management, 6) Agricultural Communications, and 7) Natural Resources and Environmental Science. Please, focus only on the career pathways that best fit your area of industry expertise and, please, list as many skills as you can. (Ramsey, 2009, p. 57)

Electronic "reminder" messages were sent to panelists approximately one week prior to the assigned due date encouraging the return of round one responses. From round one, 140 statements (n = 12; 70.5% response rate) were provided by the Delphi panelists. The researcher analyzed each statement. Similar or duplicate statements (i.e., skills) were combined or eliminated while compound statements were separated (Shinn, Wingenbach, Briers, Lindner, & Baker, 2009). From 140 original statements, 105 were retained for presentation in round two.

<u>Round Two</u>

The round two instrument asked panelists to rate their level of agreement on the retained entry-level technical skills from round one. All panelists were asked to respond to the 105 statements presented in round two. Panelists were asked to use a six-point response scale to rate the skills: "1" = "Strongly Disagree," "2" = "Disagree," "3" = "Slightly Disagree," "4" = "Slightly Agree," "5" = "Agree," and "6" = "Strongly Agree" (Jenkins, 2009; Shinn et al., 2009). Electronic "reminder" messages were sent to panelists approximately one week prior to the assigned due date encouraging the return of round two responses. Some preliminary consensus began to form in round two. Fifty-four skills (n = 12; 70.5% response rate) received a score of "5" or "6" by 75% or more of the respondents and were considered skills for which consensus was reached (Jenkins, 2009; Shinn et al., 2009). Moreover, 24 skills, for which less than 51% of the respondents scored the item a "5" or "6," were removed from further investigation (Hsu & Sandford, 2007; Jenkins, 2009).

Round Three

Buriak and Shinn (1989) described the third round of a Delphi study as developing consensus. Accordingly, the third round instrument of this study focused on developing consensus for the 27 skills that remained. The panelists were asked to rate their level of agreement for those skills that at least 51% but less than 75% of panelists had selected “Agree” or “Strongly Agree” in round two. The round three instrument included the percentage of panelists who indicated “5” (“Agree”) or “6” (“Strongly Agree”) for that skill in round two. Electronic “reminder” messages were sent to panelists approximately one week prior to the assigned due date encouraging the return of round three responses. Compared to the previous round, only a slight increase in the degree of “consensus of agreement” was expected (Anglin, 1991; Dalkey et al., 1972; Jacobs, 1996; Weaver, 1971). Accordingly, six skills received a score of “5” (“Agree”) or “6” (“Strongly Agree”) by 75% or more of the respondents and were considered skills for which consensus was reached. The remaining skill items failed to reach the established level of agreement for consensus.

Nominal data, i.e., personal and professional characteristics of the Delphi panelists, were analyzed using frequencies and percentages. For each skill item in rounds two and three, the frequency distribution valid percentage was used to determine if the item reached consensus (i.e., ≥ 75% of the panelists indicated “Agree” or “Strongly Agree”) (Buriak & Shinn, 1989).

Findings

Of the 12 panelists who completed the round one instrument, 83.4% were male and 16.6% female. Eight of 12 (66.7%) panelists reported their age to be between 20 and 49 years of age. Four of the 12 (33.4%) panelists reported being 50 years or older. Regarding ethnicity or race, 83.4% of the panelists reported they were Caucasian, and 16.6% were Native American. Two-thirds of the panelists reported a bachelor’s degree as the highest educational degree earned, 25.0% of panelists held a master’s degree, and 8.4% reported high school as their highest level of education. All of the agricultural industry panelists indicated “Full-time employment” in agriculture.

Panelists reported a range of involvement in agricultural youth organizations. Seventy-five percent indicated involvement in FFA. Other youth organizations in which panelists reported involvement included 4-H (16.7%) and “Other” (e.g., Oklahoma Junior Cattleman’s Association), 8.3%. Five or more years of participation was reported by 75.1% of panelists. The remaining panelists reported four, three and two years of participation in an agricultural youth organization. More than 80% of the panelists indicated they were “very involved” in an agricultural youth organization, 8.3% reported “somewhat involved,” and 8.3% reported “no involvement.”

In addition, more than 80% of panelists indicated participation in an SAE/4-H project; the remainder reported no participation. The SAE/4-H projects in which panelists participated included “exhibited livestock” (83.4%), “worked in an agriculturally related job” (58.3%), “raised livestock” (83.4%), and “raised crops” (50.0%). When asked if participation in SAE/4-H projects led to entry-level technical skill acquisition, eight of 12 (66.7%) panelists reported “yes” and four (33.3%) indicated “no.”

Round One Findings: Entry-level Technical Skills

The 140 skills provided by agricultural industry experts in round one ranged from "Hygiene" to "Bread Making." The number of skills identified by pathway were Food Products and Processing (FPP, 13), Plant and Soil Science (PSS, 16), Animal Science (ANSI, 37), Agricultural Power, Structures and Technology (APST, 12), Agribusiness and Management (AGBMGT, 6), Agricultural Communications (AGCM, 19), and Natural Resources and Environmental Science (NRES, 2). Following Shinn et al. (2009) recommendation regarding duplicate and compound statements, 105 items were retained for presentation to the Delphi panel in round two.

Round Two Findings: Entry-level Technical Skills

In round two, the panelists were asked to rate their level of agreement on 105 entry-level technical skills. The number of items reaching "consensus of agreement" (i.e., ≥ 75 % indicated "Agree" or "Strongly Agree"), by pathway, were FPP, 2; PSS, 5; ANSI, 29; APST, 2; AGBMGT, 3; AGCM, 13. No skill items from the NRES pathway reached "consensus of agreement" in round two. In total, 54 items reached the level of agreement described.

Round Three Findings: Entry-level Technical Skills

The panelists were asked to rate their level of agreement on 27 entry-level technical skills in round three. The number of additional items reaching "consensus of agreement," by pathway, were FPP, 1; PSS, 1; ANSI, 2; APST, 2. Overall, six additional skill items reached agreement in round three.

The total number of entry-level technical skills that reached "consensus of agreement" was 60. The distribution of entry-level technical skills by career pathway was AGBMGT, 3; AGCM, 13; ANSI, 31; APST, 4; FPP, 3; PSS, 6 (Table 2).

Table 2

Entry-level Technical Skills Students Should Learn through Their Participation in SAEs that reached "Consensus of Agreement" after Three Rounds of the Modified Delphi Study (N = 60)

Entry-level Technical Skills	Career Pathway	% Agreement
Balance sheets	AGBMGT	92.30
Assets and liabilities	AGBMGT	84.60
Simple interest	AGBMGT	84.60
Total Number of Skills for the Pathway	3	
Dependability	AGCM	100.00
Reliability	AGCM	100.00

Entry-level Technical Skills	Career Pathway	% Agreement
Trust	AGCM	100.00
Speaking (oral communication)	AGCM	100.00
Self-motivation	AGCM	100.00
Loyalty	AGCM	100.00
Consistency	AGCM	100.00
Determination	AGCM	100.00
Confidence	AGCM	100.00
Organization	AGCM	100.00
Commitment	AGCM	100.00
Team-player	AGCM	84.60
Writing letters to elected, appointed, and career officials	AGCM	76.90
Total Number of Skills for the Pathway	13	
People skills	ANSI	100.00
Know proper terminology regarding gender (livestock)	ANSI	100.00
Animal health	ANSI	100.00
Basic math	ANSI	100.00
Different classes of livestock	ANSI	100.00
Balancing a checkbook	ANSI	92.30
Basic first aid	ANSI	92.30
Proper vaccination sites	ANSI	92.30
Safety awareness	ANSI	92.30
Basic animal nutrition	ANSI	92.30
Basic livestock anatomy	ANSI	92.30
Marketplace sale trends	ANSI	92.30
Birthing assistance	ANSI	92.30
State regulations (regarding agriculture)	ANSI	84.60
Handling (livestock)	ANSI	84.60
Budgets	ANSI	84.60
Species of livestock	ANSI	84.60
Vaccination of animals	ANSI	84.60
Inventory	ANSI	84.60
Live animal evaluation	ANSI	84.60
Disease treatment (animals)	ANSI	76.90
Consumer expectations	ANSI	76.90
Animal reproduction	ANSI	76.90
Business math	ANSI	76.90

Entry-level Technical Skills	Career Pathway	% Agreement
Animal breeding	ANSI	76.90
Processing of newborns	ANSI	76.90
Bio-security	ANSI	76.90
Identify bloat	ANSI	76.90
Differences between major breeds of livestock	ANSI	76.90
Air quality (animal confinement)	ANSI	83.30
Processing (livestock)	ANSI	75.00
Total Number of Skills for the Pathway	31	
Basic computer skills	APST	76.90
Change a tire	APST	76.90
Tool identification	APST	75.00
Change oil	APST	75.00
Total Number of Skills for the Pathway	4	
Hygiene (as related to handling food)	FPP	100.00
Food borne pathogens	FPP	84.60
Harvesting (livestock)	FPP	83.30
Total Number of Skills for the Pathway	3	
Plant identification	PSS	84.60
Plant types	PSS	84.60
Marketing (agriculture products)	PSS	76.90
Weed identification	PSS	76.90
No-till (soil preparation)	PSS	76.90
Seed identification	PSS	75.00
Total Number of Skills for the Pathway	6	
Total Number of Skills, all Pathways	60	

Conclusions

Concerning objective one, a majority of agricultural industry panelists, who represented the seven career pathways for agricultural education in Oklahoma, were Caucasian males who ranged in age from 20 to 49. A majority of panelists identified FFA as the agricultural youth association in which they were most involved as youth. A majority of panelists reported five or more years of participation in agricultural youth associations; the panelists' predominant level of participation in such associations was "very involved." Eighty-three percent of panelists reported participation in SAEs or 4-H projects as youth. A majority of the SAEs or 4-H projects reported were entrepreneurial. A majority of panelists identified that their participation in SAEs or 4-H projects had led to the acquisition of entry-level technical skills.

Regarding objective two, the expert panelists reached "consensus of agreement" on 60 entry-level technical skills that should be learned through students participating in supervised agricultural experiences (Table 2). So, it was concluded that students' acquisition of these technical skills could facilitate their preparation for entry-level positions in the agricultural industry. The agricultural industry panelists reached "consensus of agreement" on the highest number of entry-level technical skills from two career pathways: Animal Science (31) and Agricultural Communications (13) (Table 2). Accordingly, it was concluded that, based on the panelists' perceptions, SAEs held more potential for students acquiring entry-level technical skills related to these career pathways (i.e., Animal Science and Agricultural Communications).

As for objective three, this study identified the career pathways that selected industry experts perceived as having the largest number of entry-level technical skills that should be learned by students who participate in the SAE component of secondary agricultural education in Oklahoma. These findings support Roberts' and Ball's (2009) content-based model of teaching agricultural education and expand its relevance to SAE. Specifically, the identification of entry-level technical skills per the seven career pathways for the AFNR career cluster informs the *Agricultural Instruction and Skill Acquisition* component of the model proffered by Roberts and Ball (Figure 1).

Recommendations

Recommendations for Future Research

Pals (1988) reported that employers recognized the benefits of SAE to students. Results of this study supports Pals' conclusion. However, inquiries should be conducted to determine the appropriate role of industry participation in the SAE component of the secondary agricultural education program in Oklahoma. Continued investigation of agricultural industry representatives' perceptions regarding the SAE component of the secondary agricultural education model is needed. For example, what are industry representatives' views on how best they could collaborate with secondary agricultural teachers regarding planning and facilitating students' SAEs such that opportunities for learning entry-level technical skills are optimized (e.g., through worksite placements)? Moreover, how are agricultural industry experts being used by secondary agricultural education teachers currently (e.g., as advisory group members) to inform the relevance of their programs better, including students' SAEs? Concomitantly, what is the role of the agricultural industry in Oklahoma regarding state-level decision making on the direction and future of secondary agricultural education, including significant programmatic aspects such as students' supervised agricultural experiences?

The career pathways of ANSI and AGCM were identified as having the most potential for entry-level skill acquisition through students' participation in SAEs. Conversely, experts identified fewer skills in the pathways of FPP, AGBMGT, APST, and PSS as having potential to be learned through SAEs. Accordingly, additional study is needed to understand more clearly the potential for skill acquisition in these pathways through student participation in SAE. The absence of any entry-level technical skills representing the NRES career pathway reaching "consensus of agreement" may reflect the panel's composition (Table 1); i.e., only one expert represented that career pathway. Two skills from this pathway were identified during round one of the study but they failed to reach sufficient consensus in round two to be carried forward. Further investigation should be conducted regarding this career pathway and its relationship to students' SAEs, especially due to the escalating imperatives of environmental sustainability and "green collar" jobs.

Recommendations for Future Practice

Teacher educators of agricultural education should make the Agriculture, Food, and Natural Resources Career Cluster and the representative career pathways more transparent to pre-service students during their teacher preparation program. The integration of SAE opportunities throughout the seven career pathways and the link that exists between agricultural industry representatives' views and expectations (i.e., potential employers) and the entry-level technical skill acquisition of secondary agricultural education students should be emphasized.

State staff members who are responsible for the secondary agricultural education program should consider facilitating externship opportunities that allow teachers to experience industry environments and expectations for entry-level workers. According to Luft (1999), externships help teachers make their instruction more relevant in preparing students for the world of work. Work-based learning experiences are important for teachers as well as students enrolled in agricultural education. Teachers could use contextual examples from their externship experiences when planning, facilitating, and assessing students' SAEs.

Teacher attitudes and expectations influence student participation in SAEs (Dyer & Osborne, 1995). Camp et al. (2000) reported that SAE, as structured then, was a vital component of a comprehensive program of secondary agricultural education. This study found that selected agricultural industry experts perceived students should learn entry-level technical skills related to their employability in the agricultural industry through SAEs, especially for the career pathways Animal Science and Agricultural Communications. So, teachers, teacher educators, and state program leaders should continue to facilitate and promote the SAE component of secondary agricultural education. In particular, teachers should consider increasing their collaboration with industry partners to provide worksite placement opportunities for students (National Council for Agricultural Education, 1992).

Discussion and Implications

Phipps et al. (2008) described the purpose of agricultural education as preparing people for entry or advancement in agricultural occupations and professions, job creation, and agricultural literacy. The National FFA Organization reported that more than 300 career opportunities in the agricultural science, food, fiber, and natural resources industry exist (2008-2009 Official FFA Manual). A comprehensive program model consisting of classroom and laboratory instruction, FFA, and supervised agricultural experience is used to deliver experiential learning opportunities to students enrolled in secondary agricultural education (Dyers & Osborne, 1995; Roberts & Ball, 2009, Talbert et al., 2007).

This study supports using the SAE component of secondary agricultural education to assist students in learning entry-level technical skills. However, not all career pathways were viewed by the study's Delphi panelists as holding or promoting a substantial number of entry-level technical skills, (i.e., Food Products and Processing, Plant and Soil Science, Agricultural Power, Structures and Technology, Agribusiness and Management, and Natural Resources and Environmental Science).

Moreover, the Oklahoma Governor's Council for Workforce and Economic Development (GCWED, 2005) report, *Understanding the Knowledge and Skill Gaps Impacting the State's Key Industry Sectors*, identified the agriculture and food-processing sector as one of six targeted industries that were at risk. This sector includes the production of agricultural products, animal food manufacturing, dairy product manufacturing, animal processing, beverage manufacturing, industrial machine manufacturing, and numerous other enterprises. Per the report, "at risk" meant those critically important industry sectors that would experience gaps in availability of workers with the necessary technical skills needed to sustain the industry in Oklahoma.

Manufacturing is one of the top five industries in Oklahoma that account for two-thirds of the state's jobs. Oklahoma's manufacturing industry is driven by processed meat, tire manufacturing, oil and gas field machinery and equipment, air conditioning and heating equipment, and poultry processing (GCWED). Moreover, of the top 10 agricultural knowledge requirements, "Mechanical" and "Food Production" were identified as the first and second knowledge items needed in the agriculture and food processing industry in Oklahoma (GCWED). To that end, the findings of this study are incongruent or "imbalanced" with the needs identified by the GCWED report. Industry experts reached "consensus of agreement" on only three entry-level technical skills for the Food Products and Processing pathway and four skills in the career pathway Agricultural Power, Structures and Technology. These are career pathways that could prepare students for entry-level positions in the Mechanical and Food Production sectors of the agriculture and food processing industry in Oklahoma.

In addition, an *Occupational Outlook Quarterly* report (U.S. Department of Labor, 2006) identified occupations and their viability from 2004 through 2014. The pathways of Food Products and Processing and Agribusiness and Management (three skills identified, respectively) will show "average growth" in the time frame represented by the report. Therefore, jobs are available and could provide future opportunities for students seeking entry-level employment in those areas either during high school (e.g., worksite placement SAEs) or after graduation. So, change may be needed to ensure that more students participate in SAEs that present them with opportunities to learn job skills in those occupational areas.

This study identified entry-level technical skills that industry experts perceived should be learned through the SAE component of the secondary agricultural education model. Accordingly, Roberts and Ball (2009) proffered a content-based model for teaching agriculture (Figure 1) relying on industry-relevant instruction that results in observable skill acquisition by students. But how should in-service teachers acquire industry-relevant content knowledge and skills so they, in turn, can facilitate SAEs such that their students learn and practice entry-level technical skills sufficiently? Is Luft's (1999) view on "externships" an appropriate answer? What may be other methods or approaches? These questions require further study and dialogue by agricultural education professionals.

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The Values and Expectations Alternatively Certified Agricultural Education Teachers place on the Supervised Agricultural Experience Program: A Qualitative Study

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Abstract

The purpose of this qualitative case study was to determine first-year Oklahoma alternatively certified agricultural education teachers' values and expectations for student participation in supervised agricultural experience programs. This study revealed that all five teachers value the program in three ways: 1) preparing students for possible careers; 2) enriching classroom and laboratory instruction with meaningful and relevant examples; 3) rewarding students' accomplishments with accolades. Specifically, these teachers value the career preparation aspect that SAE participation allows students to achieve. Also, they realize there is instructional value associated with students participating in SAEs. Teachers are able to break down barriers and build relationships with students by conducting supervisory observations and creating dialogue about their SAE program. Additionally, teachers acknowledged that discussing student SAEs in class enhances the meaning and relevance of their lessons and creates internal motivation for students to continue working toward a fruitful SAE. Further, this study found teachers expect all students to participate in a SAE program and put forth effort to achieve recognition for their efforts (i.e., State FFA Degree). Also, teachers expect students to learn to keep accurate records and compete at a high level by winning awards and accruing money whenever possible.

Introduction

Learning to do, Doing to learn, Earning to live, Living to serve.

FFA Motto

Historically, agricultural education has had a rich history of being experiential in nature (Roberts, 2006). As such, students are empowered to apply their learning of theories and concepts to real-world settings. The National Strategic Plan and Action Agenda for Agricultural Education (1999) stated that "Agricultural Education prepares students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber, and natural resources systems" (p. 3). To that end, agricultural education teachers must be adept at teaching relevant content in a hands-on, experiential manner.

Generally, secondary agricultural education teachers are expected to perform numerous job-related skills. Roberts and Dyer (2004) concluded that, "being an effective agriculture teacher goes beyond classroom teaching" (p. 94). As such, Roberts and Dyer listed eight duties in which agricultural education teachers are expected to perform as part of their job description. Among those eight was supervising students' agricultural experience programs.

Supervising agriculturally-related projects has been a duty of agricultural education instructors since the passing of the Smith-Hughes Act of 1917 (Phipps, Osborne, Dyer, & Ball, 2008). Rufus Stimson is credited for developing the idea of students participating in a project method to increase their understanding of agriculture (Moore, 1988; Phipps et al.). Supervised Agricultural

Experiences (SAEs) are intentional student-centered activities that occur outside of the formal classroom or laboratory setting under the supervision of the agricultural education teacher (Phipps et al.) and are a great benefit to students' understanding of agriculture and life (Dyer & Williams, 1997).

In line with the National Strategic Plan and Action Agenda for Agricultural Education (1999), Roberts and Ball (2009) developed a content-based model for teaching agriculture (Figure 1). The authors posited that secondary agricultural education should exist to prepare students for post-secondary education as well as industry-related employment. As such, agricultural education instructors should be cognizant of agricultural industry needs and be competent at preparing students for the skills they will need to become skilled workers in the agricultural industry.

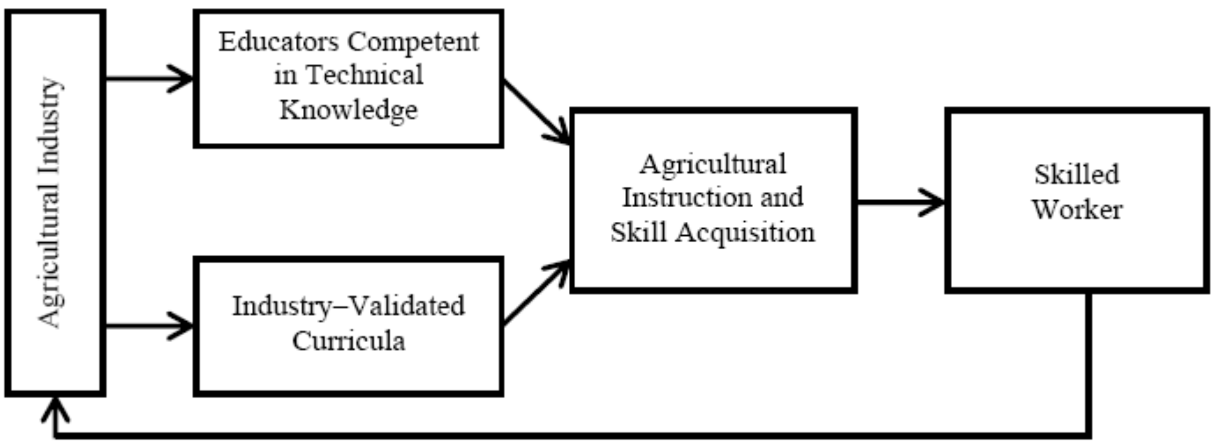

Figure 1. A content-based model for teaching agriculture (Taken from Roberts & Ball, 2009)

One means accomplishing the goal of helping students become more employable could be through emphasizing the SAE program. Ramsey (2009) noted that it should be expected of teachers to use the SAE program as a vehicle to prepare students for agriculturally-related careers. Ramsey (p. 6) stated that

> The benefits of SAE can be categorized in a variety of areas . . . [such as] the technical competencies that hold potential for being transferred from students' SAEs to the work-site. This transfer of skills acquired by students through experiential learning is an important theme associated with secondary agricultural education, i.e., preparing students for entry-level careers in the agricultural industry.

Jenkins and Kitchel (2009) found that quality SAE programs are contingent upon two factors: goal setting and student satisfaction. Specifically, a quality SAE program involves students who proactively set goals for their SAE. Another SAE quality indicator involves the level of student satisfaction in achieving the goals set for their SAE program. As such, the SAE program should be student-centered and focused on the interests of the student and not necessarily the teacher (Bellah, Robinson, Kaufman, Akers, Haase-Wittler, & Martindale, 2008).

Although every agricultural education instructor is faced with a mirage of, at times, overwhelming job responsibilities (Roberts & Dyer, 2004), it would appear that these duties would be most difficult for individuals (i.e., AC teachers) who have never encountered pre-service preparation or the student teaching internship (Young & Edwards, 2006). Yet, with the growing need for educators in today's society, nearly every state has begun offering AC programs to certify individuals with little to no pedagogical skill experience (Darling-Hammond, 2000; Feistritzer & Haar, 2008; Lynch, 1996; Walsh & Jacobs, 2007). And, little is known as to how effective AC teachers have been in the classroom (Robinson, 2009). Even less is known about the effectiveness of AC agricultural education teachers, especially as it relates to serving as an academic leader by way of a comprehensive agricultural education model (e.g., Venn diagram).

Limited research has been conducted related to AC teachers' knowledge of and ability to perform the various duties and responsibilities of an agricultural education instructor. As such, a specific need exists to determine the in-service needs of AC teachers, especially as it relates to how they value and form expectations of the SAE program.

Research has indicated that AC teachers often arrive in classrooms with real, former industry experience (Ruhland & Bremer, 2002). As such, it is plausible that understanding, appreciating, and emphasizing student SAE programs would be of great interest to AC teachers. However, Dyer and Osborne (1996) stated that "Teachers may be the greatest detriment of SAE program quality" (p. 26) because of their lack of college preparation in that area. Therefore, it is important to assess how AC teachers, who have likely never encountered any college preparation in SAEs, value the program, writ large, and formulate expectations of student participation in SAE programs.

It has been suggested that teachers can improve students' SAE programs through classroom discussions (Dyer & Osborne, 1996). However, "no study could be found which supported the inverse position" (p. 25). Specifically, Dyer and Osborne concluded that "No empirical evidence could be found to support the value of SAE programs as an instructional tool" (p. 28). Further, teachers' expectations of the SAE component can influence the degree to which students participate (Dyer & Osborne). Therefore, gaining AC teachers' values and expectations for improving classroom instruction and preparing students for post-secondary education and employment in industry (Roberts & Ball, 2009) is an imperative task.

The theoretical framework for this study was based on the expectancy-value theory. In their description of the theory, Schunk, Pintrich, & Meece (2008) stated that, "expectancies are people's beliefs and judgments about their capabilities to perform a task" . . . and "Values refer to the beliefs students have about the reasons why they might engage in a task" (p. 44). Eccles (2007) stated that the expectancy-value model relates to ". . . the individual's expectations for success, and the importance or value the individual attaches to the various options perceived by the individual as available" (p. 105). As such, an individual's experiences over time (successes and failures) influence the degree of the expectation for completion of the task. Related, the value to which an individual places on a task is influenced by the intrinsic value or amount of interest one has toward completing the task (i.e., the attainability of completing the task, the "cost" of performing the task, and the usefulness of completing the task).

Purpose of the Study

The purpose of this qualitative case study was to determine the values and expectations first-year AC teachers place on student participation in SAE programs. The following objectives guided the study:

1. What is the purpose of the SAE program?
2. What value does the AC teacher place on the SAE program?
3. What are the SAE program expectations of AC teachers?

Methods

This qualitative, case-study (Merriam, 1988) consisted of open-ended, face-to-face interviews with first-year AC teachers in Oklahoma who were encountering the resident teacher (RT) program. Dooley (2007) stated that it is appropriate to use qualitative research when ". . . the research design is emergent and flexible, the sample size is small, and the researcher spends considerable time in the natural setting" (p. 34).

A purposive sampling technique was used to identify participants for the study (Ary, Jacobs, and Razavieh, 1972), which consisted of first-year AC teachers encountering their RT program. In all, five teachers (four males and one female) were identified and agreed to participate in the study.

Of the five participants, one was female. As such, for the purpose of protecting the participants' anonymity in this study, male pseudonyms were used in reference to direct quotes. Specifically, two participants held degrees in animal science, one participant held a degree in agricultural business, one participant held a degree in agricultural education – professional education, i.e., non teaching degree, and one student held a degree in agricultural communications. Geographically, these participating teachers represented three of the five districts in Oklahoma – northwest, southwest, and southeast.

The RT program is Oklahoma's form of a teacher induction program (Robinson, 2009). Regardless of academic discipline, all first-year teachers in Oklahoma are observed three times by three committee members (principal, mentor teacher, and university supervisor) throughout the course of the academic school year. Based on the observations of all three committee members, a recommendation is made at the end of the year to "pass" the teacher and allow him/her to obtain their full teaching license in Oklahoma, or to "recommend a second year" in the RT program. The lead researcher served as the university supervisor for each of these first-year AC teachers. Due to the small sample size of first-year AC teachers (n = 5) and the amount of time the lead researcher spent in the field observing and critiquing AC teachers their university supervisor (~10-12 hours per teacher), the qualitative, case-study design was chosen (Dooley, 2007).

The researchers served as the instrument for the study (Guba & Lincoln, 1989). Specifically, each AC teacher was interviewed using an interview protocol consisting of questions adopted from recommendations based on a synthesis of the literature on SAEs by Dyer and Osborne (1997). Data collected for this study were obtained from personal face-to-face interviews.

Interviews were conducted in the AC teachers' school office or on campus at Oklahoma State University.

Each interview was conducted and transcribed verbatim by the researchers (Patton, 2002). Then, each transcription was submitted back to the interviewee as a member check to establish credibility (Guba & Lincoln; Merriam, 1995) and ensure that the transcriptions accurately portrayed the interviewee's thoughts. To ensure the dependability of the data (i.e., reliability of the data over time), the researcher utilized a rigorous set of guidelines during each interview session (Guba & Lincoln, 1989). For example, a series of questions per an established interview protocol was followed with each teacher. Additionally, the researchers provided an audit trail to guarantee the dependability and credibility of the data by making notes on the transcriptions for east of determining themes (Trochim, 2006). To ensure confirmability (Guba & Lincoln), all data were analyzed line-by-line by the lead instructor (Patton, 2002) and coded into themes depending on recurring words and statements (Patton).

Specifically, the researcher personally visited each AC teacher three times throughout the course of the academic year – once in mid-September, once in mid-February, and once in mid-April. In an effort to build a trusting relationship with the AC teachers and not interfere with the RT committee work, the interviews were not performed until the last observation and committee meeting had been established.

Although a structured protocol was employed in the study, it did not prevent the participant's from wavering off the assigned questions. Because a qualitative design needs to be flexible (Dooley, 2007), the researchers allowed participants to expound upon their thoughts whenever necessary. As such, probing questions were used throughout each interview in an effort to maximize the response of the participants.

Findings

Research Question One: Purpose of the SAE Program

Theme: SAE Program Philosophy

When asked about the purpose of the SAE program, each AC teacher responded that the SAE program component of the agricultural education model, writ large, is a highly effective, impactful, and relevant tool that is used to assist students in acquiring important life skills and experiences. AC teachers acknowledged that, due to the variability in programs, numerous opportunities exist for students to participate in SAEs. As such, each teacher attempts to obtain participation in SAEs from every one of their students.

Greg said emphatically, "I really try to get every student involved. I think it [SAE] is a very good program where they [students] can make some money and learn some life preparation for college and on down the road." Cal stated, "A strong program is one that they are active in and learning from." He added that it is important for students to gain "real-world experience" in order to expand their knowledge about a certain agricultural industry. Jon said that SAEs should be used as a "foundational tool" in which students can build skill sets for a potential career.

Jon furthered his thought by stating,

> I think it [SAE involvement] is very important. It teaches them [students] life skills. It teaches them responsibility. It teaches them everything! Whenever they get out in the

> real world, they are going to be much farther ahead of those kids who did not do an SAE program.

When asked how he would define a quality SAE program, Mike replied, "Quality isn't how much money they put in it. Quality isn't [having] the best facilities. Quality is that kid that knows his project. And, quality is that kid that does it himself."

Research Question Two: Value of the SAE Program

Theme: Career Preparation

When asked about the value of the SAE program, teachers recognized that due to its inherent experiential nature, SAEs allow students to develop important career preparation skills. The teachers in this study stated that valuable skills are learned by students and that the program is successful in preparing them for life if it is student owned and managed.

Sam stated, "SAEs from my perspective is a way of growing and developing to the person you will become. SAEs give students accountability, and that's something I've noticed a lot of students lacking." Mike added, "I think it [SAE] can be life changing for kids. You give them a direction and sometimes you change their pathways with [their] projects."

Exposing students to and preparing them for possible agriculturally-related career fields has long been a purpose of secondary agricultural education (Roberts & Ball, 2009). In an effort to expose students to possible future employment, Jon says many of his students "work for agriculture businesses" as part of their SAE. This experience is invaluable to his students. Jon added, "They just want to go to school and then come right down there [to their job] and work. And, they have that relationship with those industries already to help them whenever it's time for that [full-time employment]."

Greg emphasized that if students find a SAE that they enjoy, then "it gets them on a better career path." Sam stated that SAEs are imperative for students who are seeking employment because they help students make connections with industry. Jon stated that he encourages his students with livestock exhibition SAEs to join breed associations as a way of connecting with industry representatives. Additionally, Sam emphasized that, ultimately, employers want to see that students have real-world experience, and SAEs are a great tool for achieving this notion.

Theme: Enriching Instruction

Additionally, these teachers noted the instructional value of the SAE program. The agricultural education model is integral in nature. As such, each part of the model should inform the others. A relatively equal amount of time should be devoted by the teacher to each part of the model. And, students should be involved in all parts of the model. Then, students' SAE involvement can be integrated into the classroom setting.

When asked about the instructional value of students' SAE programs, Cal stated that the value varies from one individual to the next. Some students gain more from their experiences than others. Mike emphasized that, "Kids like to be able to tell about their projects. It lets them do a little teaching." As such, emphasizing the SAE program with students can increase their internal motivation. Greg stated that he uses students' SAEs as an icebreaker with students before and during class. Because he visits students' SAE programs at their homes, he develops personal relationships with them. As such, once they enter his classroom, he has something to immediately begin talking with them about.

Additionally, discussing SAE programs aloud in class is good for all students because, vicariously, there may be something said that helps another student with his/her SAE program. Jon said, "I can bring a lot of their experiences into the classroom, and if they are having problems, I can bring it in and discuss it with the whole class." Greg noted that when he uses examples of students' SAEs in his class lectures, students listen because there is a sense of meaning and relevance added to his topic.

Some of the instructional values of having students participate in a SAE program is the development of critical thinking skills. Once developed, these skills can be used by students in the classroom and enhance the discussion of course material. In essence, SAEs broaden the scope and breadth of student understanding and enrich the class session for every student. Greg stated, "I think hands-on learning and decision making are two very important aspects of the SAE [program]. I think it [SAE program] really increases confidence in students when they can make a decision on their projects without calling me."

Jon noted numerous intangibles of students who have SAEs as compared to those who do not. He smiled and said,

> It [SAE program] makes them work harder. For instance, the kids who show [i.e., exhibit livestock] know that they have to be eligible to go to the show. So, not only is that hard work reflected in their SAE work, those kids are more apt to be more prompt to have things turned in, and they're always more organized [as compared to those who do not have SAEs].

Theme: Rewards and Accolades

Although teachers desire for SAEs to assist students in their development, there are also self-fulfilling prophesies associated with students participating in SAE programs. In Oklahoma, numerous opportunities exist for students to compete with their SAE program. These competitions exist on the local, county, state, and national platforms. As such, teachers note that if students have a solid SAE and are able to participate at a high level, then that serves as an indicator that they have succeeded as a supervisor.

When asked to respond to the effects of the SAE program quality on student achievement, Greg stated, "The better it [SAE] is, the better they are going to do in a contest [i.e., Career Development Events – where students learn about and compete in events related to career development]." Therefore, Greg works hard with his students so they can represent the agricultural education program at a high level at competitions. When students compete at a high level and are rewarded for their efforts, he believes this is a great motivational tool for other non-participative students.

Mike echoed this sentiment by stating that he values SAEs because he sees them as a way to motivate his students to remain in the program. As such, SAEs serve as a form of retention for his students. He stated that his goal is to find each student a SAE program that is of interest to them. Then, through working on that SAE, student motivation is increased as is their willingness to remain enrolled as a secondary agricultural education student. Related, he uses current students who have SAEs to recruit students who do not. He stated, “My kids do more good than I can do. They get each other interested more than I can.”

Research Question Three: Expectations of the SAE Program

Theme: Student Participation and Achievement

Teachers have expectations of the SAE program. Each teacher noted their expectation for students to participate in a SAE program. In addition to students participating in the SAE program, teachers also expect students to perform at a high level with their program. In some cases, teachers expect students to win awards and money for their efforts. Although teachers have their own set of expectations, they believe students are often motivated to participate in an SAE program if the cost is low enough and the pay off is great enough.

Teachers noted the benefits of the SAE program on student learning. Jon stated, “The greatest benefit is the responsibility of taking care of something and reaping the rewards of that.” As such, SAE participation holds numerous opportunities to teach students life lessons. Greg pointedly stated, “Records are ‘big’ with me. Having some success in award areas [is also ‘big’ with me].” Sam stated that SAEs are a great way to get students involved in something positive and keep them off the streets. He believes SAEs allow students an excuse for not getting into trouble because “they have some sense of accountability and responsibility.”

Teachers also expect students to take their SAEs seriously. Jon stated,

> My deal is it’s either all in or all out. We are not going to do anything half way because they’re not going to waste their time, their parent’s time, their parent’s money and my time. It’s just the way it is. They’re going to get committed and do it right.

Mike stated,

> I want them to have a good project. Everybody wants to win. Everybody loves to win. [However] I want those kids to learn something from them. I don’t want those kids that I have to tell everything to. I want them to learn progressively. I want them to be self-sufficient.

Although each teacher emphasized the importance of SAE participation for their students, they also acknowledged that not every one of their students has an active SAE program. When asked about the barriers of the SAE program, issues involving students’ time commitment to their SAEs and the available resources needed for SAEs arose. Greg responded that money can be a factor for some students. Greg furthered,

> I think students don’t realize that they can have a project that’s not a livestock project. Especially in small towns, I think it’s [SAE] really livestock show focused. When we break that barrier, I think it will make it a lot easier for kids to get involved in one [SAE].

Jon agreed that some students’ parents do not have the financial ability to provide the facilities needed for a strong SAE program. Jon also indicated that time was a major barrier which prevented some students from participating in the SAE program. “They [students] are just so strung out. There are only so many hours in the day.” Cal agreed,

> They've got to have all this time to devote to their SAE program to make it go. A lot of kids that really have those strong programs are also your strong athletes so they are having to battle to figure out time management at this early age.

Jon stated emphatically, "I would hope that as much time and effort as they put in to it [their SAE program], that their expectations are as high as mine." Sam stated that students in his program are most interested in achieving the state FFA degree. That degree is incumbent upon students having a profitable SAE program. For other teachers, they believe students are most interested in participating in SAEs because of their ability to make money. Greg stated,

> Money is a great motivation. I hope they want to learn something about it [their SAE] and see some development, but that's not always the easiest sell. They [students] are not going to say they want to learn anything. They want to win awards and they want to make money.

Jon noted that some of his students amaze him with their ability to participate in numerous SAEs while also being an active member in other school functions and programs. He stated,

> Some of them have more than one SAE program. Some of them have four [different ones]. Talk about keeping them hooked up all the time! That's not including their other school activities that they do. I don't know how some of these kids make it sometimes because I just know as the teacher I am running ragged all the time. I can only imagine what their lives are. By the time they get home, take care of the animals, take care of their crops, or whatever their SAE program is, and then they got school, and a lot of them play sports, they must feel as though they are being pulled in fifty different directions all the time.

Unfortunately, some teachers stated that, although they would like all students to have an SAE, it is not practical or realistic due to students' lack of interest. Jon said matter-of-factly, "Some just don't care, period! There are just some kids you are not going to make them do anything." Mike stated in a frustrated tone,

> They don't have that drive. And, if they don't have that drive, if they're just filling your class and passing your class, then that's all they want is their credit for that. I've got some who are just biding their time.

Mike added that he believes it is difficult to make changes in student perceptions as a first-year teacher, especially as it relates to the importance of SAEs. As such, he focuses on encouraging younger students to consider a wide range of SAE opportunities. Mike believes that if he can begin with his freshmen students, then the number of students participating in a variety of SAEs will escalate. So, he strives to create SAE opportunities that are enjoyable and then relies on those students who participate to encourage others. He stated,

> My expectation is on those younger kids. That's where I'm basing my growth. The best growth will come from those kids telling each other about it [their SAE program], and them wanting to do it also. When they see the good things their classmates are doing, they'll want to do it [participate] too.

Conclusions

The purpose of this qualitative case study was to determine the values and expectations first-year AC teachers place on student participation in SAE programs. All five AC teachers interviewed in this study have basic, foundational knowledge of the SAE program and its purpose. Additionally, all five teachers value the program and have certain expectations for students in fulfilling requirements for their SAE program. Specifically, this study found that teachers value three aspects of the SAE program: 1) preparing students for possible careers; 2) enriching classroom and laboratory instruction with meaningful and relevant examples; 3) rewarding students' accomplishments with accolades. In terms of expectations, this study found teachers expect all students to participate in a SAE program and put forth effort to achieve recognition for their efforts (i.e., State FFA Degree).

These teachers believe that SAEs build skills in students that are important for college and life. This finding is consistent with Roberts and Ball (2009) who posited that secondary agricultural education should exist to prepare students for post-secondary education as well as industry-related employment. However, these teachers stated that in order for students to maximize their potential with their SAE program, it must be student-led (e.g., owned and managed). If these programs are managed by the student, a sense of empowerment is achieved. As such, once students feel empowered, they begin to learn and develop life skills which will serve them well as they progress to post-secondary education or enter the workforce.

Dyer and Osborne (1996) suggested that teachers can improve students' SAE programs through classroom discussions. Yet, the authors concluded "no study could be found which supported the inverse position" (p. 25). This study adds to the literature base concerning the "inverse position." Teachers in this study stated that there are vicarious benefits for students' SAE development through classroom discussion. Students enjoy being able to discuss their SAE and hearing about others' programs as well. Teachers have the ability to make a profound impact on students' SAEs through class discussions.

When students can see the benefit of their SAE program and how it will impact their lives, they are more willing to participate. This finding supports Jenkins and Kitchel (2009) notion that a quality SAE program involves students who proactively set goals for their SAE. Additionally, the teachers in this study alluded that students are more apt to participate in SAEs when the cost is minimal and the rewards are great. This finding aligns with Eccles' (2007) notion that the value to which an individual places on a task is influenced by the intrinsic value or amount of interest one has toward completing the task (i.e., cost).

Recommendations for Practice

Teachers should continue to stress the importance of SAEs to students. Using students' SAEs enrich class discussions related to the content being taught. The student benefits because lessons become more meaningful and relevant. Plus, they can feel empowered when asked to share their SAE with their classmates, increasing their internal motivation related to their SAE. Reflecting on the successes and failures of their SAE, allows students to value their program at a higher level (Schunk et al., 2008).

Further, because of the integral nature of the agricultural education model used in this study, it is recommended that SAEs be required of students in Oklahoma secondary agricultural education programs. To that end, teachers should seek ways to integrate SAEs into their classroom instruction and discussion whenever possible. Teachers should continue to allow those students who have SAEs to present and highlight their programs to their classmates whenever appropriate.

Upon requiring all students to have SAE programs, it is important for teachers to determine ways in which these programs can be assessed more objectively. Specifically, teachers should sit down with students and their parents at the first of the year and list goals they hope to achieve with the program. Further, a timeline of dates in which milestones will be accomplished would be valuable. Then, teachers need to work with students and parent to develop a grading rubric for how the program will be evaluated. This step will allow the student to realize the expectations for success of the SAE program (Eccles, 2007) and stress the teacher's value of the program (Schunk, et al., 2008).

Professional development and in-service workshops should be held for AC teachers related to different opportunities for student-led SAE programs. Although the teachers in this study mentioned that numerous opportunities exist for students to experience SAEs, the majority of them are focusing on and perhaps even overemphasizing entrepreneurial SAEs (i.e., livestock exhibition). As such, it is unknown if they truly understand enough about the "opportunities" that exist in the SAE program, or even what qualifies for an SAE, to adequately share those ideas with their students. Roberts and Dyer (2004) opined that sometimes AC teachers don't know what they don't know. Therefore, workshops could focus on various types of SAEs and opportunities that would exist in each. Additionally, workshops should focus on helping AC teachers understand how to evaluate and assess SAE programs. Perhaps special emphasis should be placed on developing authentic assessments.

Recommendations for Future Research

Future studies should look at the impact SAEs have on student academic achievement. In other words, does being involved in an experiential, student-led SAE program that relates to course content in which students are exposed, have an effect on student learning of that content? Dyer and Osborne (1996, p. 27) stated "Experimental studies should be conducted to assess the educational value of quality SAE programs." In line with their recommendation, a quasi-experimental study should be conducted comparing students who have SAEs with those who do not on end-of-instruction examinations in agriculture. Specifically, Oklahoma has competency examinations in five different agricultural content areas. So, students in a number of courses could be tested and compared to determine the effect of the educational value of SAEs on student achievement.

Ramsey (2009) noted that SAEs can be used to make students aware of various agriculturally-related careers. Is there a correlation between employment and SAE participation? Specifically, supervisors of high school graduates should be queried to determine which skill sets students are proficient and which they are deficient. Then, comparisons could be made between those who participated in a SAE program versus those who did not. Further research could investigate whether students who participated in a variety of SAEs developed richer skill sets and were more employable than those who participated in one robust SAE.

Lastly, this study should be replicated to compare AC teacher to traditionally certified teachers. One shortfall of most teacher preparation programs is the fact that graduates usually have very limited "real-life" experience. A positive is that they have pedagogical preparation (Robinson, 2009). A shortfall of AC teachers is that they often fail to have any pedagogical preparation (Darling-Hammond, 2000; Feistritzer & Haar, 2008; Lynch, 1996; Walsh & Jacobs, 2007). Yet, a positive is that they often have industry experience. Therefore, the question becomes does one route to certification have better implications for teaching SAEs than the other?

Discussion/Implications

Although each teacher in the study is emphasizing SAEs to their students, it is clear that not every student is participating in this important program. Why is that? Are teachers not emphasizing enough variety when it comes to discussions with students about possible SAEs? Bellah et al. (2008) stated that SAE programs should be student-centered and focused on the interests of the student and not necessarily the teacher. However, in some cases, it appears that these teachers may be living vicariously through their students' SAE programs by forcing their personal agenda instead of allowing students to develop their own interests and ambitions related to SAEs.

With the economy's current status, it appears as though efforts should be devoted to educating people about how to best manage their finances. At different times throughout these interviews, teachers in this study related the importance of student SAEs to maintaining their record book. To that end, it seems plausible that agricultural education serves as a nexus for introducing students to the importance of money and data management. Educating students on how to manage their money is a trait that would definitely serve them well in life. What better vehicle exists to teach this important life skill than the SAE program? Teachers need to think larger when it comes to introducing SAEs to their students. This program should be required of every student in an effort to teach important employability and life skills such as problem solving, decision making, honesty, and data management, to name a few.

To maintain the relevancy and meaning of the SAE program, teachers should focus students to the current needs of the 21st Century. The phenomenon of the "Green Wave" has swept across our country with rapid fury. Wind turbines, cellulosic fuels, and alternative energy are buzz words that serve as critical issues in which American's are constantly exposed in today's mainstream media. Implications for educating students about these issues are eminent in secondary agricultural education programs. As such, students could benefit from research/exploratory SAE programs in which these issues are analyzed more closely.

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Impact of FFA and Supervised Agricultural Experience on Student Retention and Academic Success

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Abstract

Freshman students with prior FFA experience in a selected College of Agriculture demonstrated greater retention following their first year of college than their peers without FFA experience. Over 97% of students with FFA experience were retained in the College of Agriculture while only 60% of students without FFA experience at the secondary level returned for their sophomore year. While there was a statistically significant difference between students with secondary FFA experience and those who did not participate in FFA activities, summated FFA experience was not a significant predictor of academic success, as measured by GPA. Summated FFA experience revealed students were more likely to attend conferences and least likely to have participated in Agri-Science projects. Students with Supervised Agricultural Experiences (SAE) at the secondary level failed to contribute significantly to the variance in academic success. Similarly, retention for participants with SAEs did not differ significantly from their peers without SAEs.

Introduction and Theoretical Background

Colleges of agriculture and natural resources have been called to address student retention and recruitment. Declining enrollments in many colleges of agriculture and emphasize the need to address student recruitment in colleges of agriculture (Gilmore et al). Factors influencing student retention at four year institutions has been the subject of considerable research (Astin, 1997, 1999; Bean & Metzner, 1985; Tinto, 1975, 1999). Researchers have also investigated the relationships between student enrollment characteristics and student retention within colleges of agriculture (Dyer, Breja, Wittler, 2000; Garton, Ball, Dyer, 2002; Wildman & Torres, 2001). For example, Wildman and Torres found most students indicated prior agriculture experience was the most influential factor when selecting an agricultural major. Esters (2007) found high school GPA and mother's (or female guardian's) level of influence were most likely to predict whether urban students enrolled in postsecondary agricultural programs. Wildman and Torres concluded recruitment efforts needed to focus on students who have agricultural experiences. Similarly, Dyer et al. concluded colleges of agriculture should recruit students with agricultural experience. However, is secondary agricultural experience, including FFA experience, a significant predictor of college retention?

Dyer et al. (2000) suggested college retention could be predicted from student admission criteria. In addition, these researchers concluded that enrollment in secondary agriculture classes and agriculture experience were more accurate predictors of student retention. However, Garton et al. (2002) found the best predictor of academic performance during the first year of college was high school core grade point average. Dyer et al. found students with agricultural experience, "completed high school agriculture courses, were members of the FFA and/or 4-H, and lived in a rural setting are more likely to complete a degree in a college of agriculture than freshmen who have not had those experiences" (p. 498). Surprising, these researchers also found students with higher class ranks were more likely to leave colleges of agriculture than students with agricultural experience and/or high school agricultural coursework.

Prior research suggested student involvement in secondary agriculture courses may influence college retention and graduate rates (Garton et al., 2002; Dyer et al., 2000). Ball, Garton and Dyer (2001) found students involved in agricultural youth organizations had significantly higher GPAs and contributed greater retention rates for second year college students. These findings suggested prior experiences, including secondary agriculture coursework, influence retention and academic performance (Ball et al., 2001). However, will these findings hold true in programs where secondary agriculture enrollment mandates FFA membership? Will the level of student involvement in FFA programs at the secondary level be related to academic success in a college of agriculture?

Participation in leadership development activities offered by the National FFA Organization has been the subject of considerable research (Ball et al., 2001; Dormody & Seevers, 1995; Dyer et al., 2000; Garton et al., 2002; Gliem & Gliem, 2000; Talbert & Balschweid, 2004; Townsend & Carter, 1983; Wingenbach & Kahler, 1997). FFA participation has also been linked to academic performance and retention (Ball et al.; Dyer et al.; Garton et al.). However, FFA participation has been measured utilizing a variety of methods, including university admission data (Garton et al.; Ball et al.), instruments developed from the FFA manual (Dormody & Seevers) and student perceptions (Talbert & Balschweid; Wingenbach & Kahler, 1997). Will self-reported participation in FFA organizations provide a better understanding of the leadership activities completed by secondary students? Will knowledge of these activities provide insight for admissions or recruitment criteria in the College of Agriculture at California State University, Chico?

The impact of SAE participation may also impact student retention and academic success. Previous research has examined the role and efficiency of the SAE model (Camp, Clarke, & Fallon, 2000; Cheek, Arrington, Carter, & Randell, 1994; Dyer & Osborne, 1996; Dyer & Williams, 1997; McLean & Camp, 2000). Additionally, SAEs appear to have been supported by agricultural educators for decades. However, the role SAEs play in student retention and academic success at the post-secondary level appears to be limited. Would participation in SAEs at the secondary level contribute to greater academic success at the post-secondary level?

The theoretical framework for this study is based primarily upon two college retention models. College retention is framed by Bean's Student Attrition Model (Bean, 1983) and Astin's involvement theory (Astin, 1999). Bean's Student Attrition Model compares student retention to organizational turnover (Bean). The persistence behavior of students can be influenced by behavior intention (Nora, Cabrera, Serra Hagedorn & Pascarella, 1995). External factors have been shown to impact attitudes and persistence decisions (Bean). Astin's involvement theory defines student involvement as "the amount of physical and psychological energy that the student devotes to the academic experience" (p. 518). His theory suggested there are five components to involvement, including the following: physical and psychological energy must be invested; involvement occurs along a continuum; involvement contains both quantitative and qualitative components; student learning and development is directly proportional to student involvement; and the effectiveness of educational policy is directly related to its ability to student involvement. FFA participation may be an external factor which influences student involvement and thus impacts student retention.

Purpose and Objectives

The purpose of this study was to compare the level of secondary FFA involvement of freshmen in a selected college of agriculture with their academic success during their first year in a college.

The specific objectives of the study included:

1. Identify the demographic characteristics of incoming freshman students within the College of Agriculture (college major and sex).
2. Identify level of participation in secondary agriculture courses, as measured by years of enrollment, level of participation in FFA activities (offices held, leadership CDE's, leadership conferences, content specific CDE's, proficiency awards, and agri-science involvement), and level of participation in SAEs held by freshman in the College of Agriculture.
3. Determine the amount of variance in first year GPA accounted for participation in summated participation in FFA activities.
4. Determine the amount of variance in first year GPA accounted for participation in summated participation in SAE activities.
5. Determine if differences exist between participation in FFA activities and retention in a college of agriculture, as measured by sophomore year enrollment.
6. Determine if differences exist between SAE participation and retention in a college of agriculture, as measured by sophomore year enrollment.
7. Determine if a relationship exists between students' self-perceived level of participation and summated FFA experience.
8. Determine if a relationship exists between students' self-perceived level of participation in SAEs and summated SAEs.

Methodology

The population of interest in this study included all freshmen undergraduate students enrolled in the college of agriculture during the fall, 2008 semester ($N = 57$). The frame was established from reliable university enrollment records. A census study was completed, thus sampling procedures were not employed. Because this study utilized a census, no attempt should be made to generalize the findings beyond the identified population.

Data were collected using a researcher designed questionnaire which was administered directly to the participants. The questionnaire included demographic questions as well as questions designed to ascertain the level of involvement in agriculture courses, the FFA program, and participation in SAE programs. First, the questionnaire ascertained the level of participation in all leadership and career development events (CDEs) supported by the California State FFA. More specifically, participants were asked to share the number of years they were enrolled in secondary agriculture courses, if any, and the following: officer experience; competition in leadership CDEs (creed, prepared speaking, extemporaneous speaking, job interview, parliamentary procedure, best informed greenhand and opening and closing); leadership conference attendance (Greenhand; Made For Excellence; Advanced Leadership Academy; State Leadership Experience; State FFA Conference; and National FFA Conference); content specific CDEs (all CDE's not previously accounted for as leadership CDE's); proficiency awards; and agri-science projects. For each area, participants were asked to indicate numbers of years and level of participation. Level of participation was identified as local or chapter, sectional, regional, state, or national levels. Each specific leadership area was summated to achieve a summated FFA participant score. Summated FFA participation was calculated by weighting the level of participation and years completed for each leadership area. For example, a student completing one year as a chapter officer received a participation score of one while a student who completed one year as a sectional officer received a participant score of two. Thus, participant's leadership experience was summated to account for quantity of activities and level of participation. Participants were also asked to indicate their perceived level of involvement in local (chapter) FFA activities, as measure by a five point Likert scale.

The questionnaire also ascertained the level of student participation in SAEs. Participants were asked to indicate their participation in the areas of market animals, breeding animals, agricultural mechanics, paid and unpaid work experience, and crop or horticulture. The questionnaire also allowed the population to add any other SAE in which they had participated while enrolled secondary agricultural programs. The total years of participation for each SAE were calculated by summating self-perceived years of experience. Finally, participants were asked to indicate their perceived level of involvement in a SAE program, as determined by a five point Likert scale.

The questionnaire was examined for both validity and reliability. A panel of experts reviewed the questionnaire for both face and content validity. A pilot test was given to 30 undergraduate students with similar characteristics of the population to assess the reliability of the instrument. A Cronbach's alpha was conducted and the estimate reliability was .77. Nunnally (1967) suggested that reliability estimates of .50- .60 might be high enough in the early stages of research, thus the instrument was considered reliable.

Data were collected directly from the participants during the freshmen orientation course, as all members of the population were required to enroll in this undergraduate course. Fifty-seven of the 57 members of the target population completed usable questionnaires. However, no attempt should be made to generalize the findings of this study beyond the targeted population.

Data were analyzed using SPSS 17.0®. The alpha level was set a priori at .05. Conventions established by Davis (1971) were used to describe the magnitude of correlations where 1.0 is described as perfect, .70-.99 is described as very high, .50 - .69 is substantial, .30-.49 is moderate, .10-.29 is low and .01-.09 is described as negligible.

Results and Findings

Results from this study are limited to the assessed population and should not be generalized to other populations. After initial data collection, data were collected from 57 students, yielding a response rate of 100%.

The first research objective sought to identify the characteristics of incoming freshman students within the College of Agriculture, including college major and sex. Demographic data were the collected to address the first research objective (see Table 1). Over 70 % percent of college freshman in a selected College of Agriculture were female (n = 42). Nearly 50% of the participants selected to major in animal science (n = 28) while the smallest percentage of students were enrolled as general agriculture majors (8.80%).

Table 1
Demographic Characteristics of College Freshmen (N = 57)

Demographic Characteristic	*f*	%
Sex		
Female	41	71.90
Male	16	28.10
Major		
Animal Science	28	49.10
Agribusiness	18	31.60
Agricultural Education	6	10.50
General Agriculture	5	8.80

Objective two sought to identify the level of participation in secondary agriculture courses, as measured by years of enrollment, level of participation in FFA activities and level of participation in SAEs held by freshman in the College of Agriculture (see Tables 2, 3, 4). More than 60% of the population indicated enrolment in a least one year of agricultural courses. Over 45% of the participants indicated four years of enrollment in agricultural education courses and FFA while 20 respondents did not participate in secondary agriculture programs. The majority of students with FFA experience were enrolled in agricultural education courses during all four years of high school (n = 27). However, slightly over 12% would not be considered program completed as designed California FFA criteria.

Table 2
Summary of Student Enrollment in Agricultural Education Courses (N = 57)

Agricultural Courses	*f*	%
No enrollment	20	33.30
Enrolled	37	66.70
1 year	2	3.50
2 years	5	8.80
3 years	3	5.30
4 years	27	47.40

Participation in FFA activities, as determined by offices held, leadership CDE's, leadership conferences, content specific CDE's, proficiency awards, and agri-science involvement w. indicated leadership conferences contributed most to participants' summated FFA experiences, with a mean score of 13.22 (SD = 10.85) (See Table 3). Conversely, agri-science participation had the lowest mean score (M = .59, SD = 1.98).

Table 3
Level of Participation in FFA Activities by Students Enrolled in Agricultural Courses (N = 57)

Participation	*M*	*SD*	Range
Summated FFA Activities	38.16	30.90	0 - 103
Conferences	13.22	10.85	0 - 37
Other CDEs	9.22	11.62	0 - 46
Leadership CDEs	8.76	8.67	0 - 32
Proficiency Awards	4.41	9.06	0 - 50
Officer	1.97	2.70	0 - 12
Agri-science	.59	1.98	0 - 10

The level of participation in SAEs of freshman in college of agriculture found over 60 % of students indicated some level of participation in SAEs while involved in secondary agricultural programs (see Table 4). The greatest percentage of students completed market livestock SAEs (*n* = 31) while the least SAE participation was observed in the crop/horticulture area (*n* = 4).

Table 4
Level of Participation in SAE by Students Enrolled in Agricultural Courses (N = 57)

Participation	*f*	%
Total SAE	35	61.40
Market livestock	31	54.40
Work experience	18	31.60
Breeding livestock	13	22.80
Agricultural mechanics	8	14.00
Crop/horticulture	4	7.00

Objective three sought to determine the variance in first year academic success within the college of agriculture, as measured by GPA, accounted for by participation in summated FFA activities. An intercorrelation matrix was generated prior to conducting a simultaneous linear regression analysis to evaluate the threat of multicollinearity (see Table 5). The intercorrelation matrix contained the independent variables (sex, and summated FFA participation), and the variable of interest (GPA). Guidelines outlined by Berry and Feldman (1985) were used to address multicollinearity. None of the bivariate correlations between the predictor (independent variable) approached .80, thus no potential threat for multicollinearity was found.

Table 5
Intercorrelational Matrix for First Year Academic Success of Students With FFA Experience (N = 57)

Variable	X_1	X_2	Y
Sex[a] (X_1)	1.00	-.13	-.02
FFA Participation (X_2)		1.00	.10
First Year GPA (Y)			1.00

Note. [a]Sex coded: female = 1, male = 2.

Table six shows GPA was the dependant variable while sex and summated FFA experience were the independent variables. Approximately one percent of the variance in GPA can be explained by the linear combination of sex and summated FFA experience. However, the model was not significant (F (2, 54) = .29; $p > .05$).

Table 6

Summary of Simultaneous Regression Analysis Predicting First Year Academic Success of Participants With FFA Experience (N =57)

Variable	β	95% C.I.
Constant	2.72	[2.13, 3.13]
Sex[a]	-.01	[-.42, .40]
Summated FFA Experience	.01	[-.01, .01]
R^2	.01	
F	.29	

Note. N = 57. CI = confidence interval. [a]Sex coded: female = 1, male = 2.

Determining the amount of variance in first year GPA accounted for by participation in SAEs was the purpose of fourth research objective. An intercorrelation matrix was generated prior to conducting a simultaneous linear regression analysis to evaluate the threat of multicollinearity (see Table 7). The intercorrelation matrix contained the independent variables (sex, and summated SAE participation), and the variable of interest (GPA). Guidelines outlined by Berry and Feldman (1985) were used to address multicollinearity. None of the bivariate correlations between the predictor (independent variable) approached .80, thus no potential threat for multicollinearity was found.

Table 7

Intercorrelational Matrix for First Year Academic Success (N = 57)

Variable	X_1	X_2	Y
Sex[a] (X_1)	1.00	-.30	-.02
SAE Participation (X_2)		1.00	-.18
First Year GPA (Y)			1.00

Note. [a]Sex coded: female = 1, male = 2.

Table 8

Summary of Simultaneous Regression Analysis Predicting First Year Academic Success of Participants With SAE Experience (N =57)

Variable	β	95% C.I.
Constant	2.72	[1.77, 3.67]
Sex[a]	.23	[-.39, .85]
Summated SAE Experience	-.02	[-.07, .03]
R^2	.05	
F	.80	

Note. N = 57. CI = confidence interval. [a]Sex coded: female = 1, male = 2.

Table eight shows GPA was the dependant variable while sex and summated SAE experience were the independent variables. Approximately five percent of the variance in GPA can be explained by the linear combination of sex and summated SAE experience. However, the model was not significant (F (2, 34) = .80; $p > .05$).

Objective five sought to determine the relationship between secondary FFA experience and retention in the college of agriculture, as measured by sophomore year enrollment. The population of 57 students revealed a significant difference between FFA experience and college retention (see Table 9). Results found only one student (2.50%) with FFA experience did not enroll in their sophomore year in the college of agriculture while eight of the 20 students without FFA experience at the secondary level failed to be retained in the college of agriculture after their freshman year (40%). The Chi squared test of independence yielded a value of 13.59 ($p < .01$).

Table 9
Contingency Table of Retention and FFA Experience (N =57)

	Retained		
	Yes	No	Total
Did Not Participate in FFA	12 (60.00%)	8 (40.00%)	20
Participated in FFA	36 (97.50 %)	1 (2.50%)	37
Total	48 (84.20 %)	9 (15.80%)	57

χ^2(1, N = 57) = 13.58, * $p < .05$.

Determining if a relationship exists between students' self-perceived level of participation and summated FFA experience was the purpose of the sixth research objective. Pearson's product moment correlation was conducted to address this objective (See Table 10). A statistically significant, positive and substantial relationship exists between summated FFA participation and students' self perceived level of participation ($r = .57$).

Table 10
Pearson Product Moment Correlations for Students' Perceived FFA Participation (N = 57)

Variable	X_1	Y
FFA Participation (X_1)	1.00	.57*
Perceived level of participation (Y)		1.00

p < .05

Objective seven sought to determine if differences existed between secondary SAE experience and retention in a college of agriculture, as measure by sophomore year enrollment. Due to small expected values, a Fisher's exact test was calculated and revealed participants did not show a significant difference between SAE experience and college retention ($p > .05$) (see Table 11). Results found three students (5.26 %) with SAEs did not enroll in their sophomore year in the college of agriculture, while five of the 22 students without SAE experience at the secondary level failed to be retained in the college of agriculture after their freshman year (8.77%).

Table 11
Contingency Table of Retention and FFA Experience (N =57)

	Retained		
	Yes	No	Total
Participated in SAE	32 (56.14%)	3 (5.26%)	35
No SAE	16 (29.82%)	6 (11%)	22
Total	49 (84.20 %)	9 (15.80%)	57

$p = .08$

The final research objective sought to determine if a relationship exists between students' self-perceived level of participation in SAE and summated SAEs. Pearson's product moment correlation was conducted to address this objective (See Table 12). A positive and moderate relationship exists between summated SAE participation and students' self perceived level of SAE participation ($r = .31$).

Table 12
Pearson Product Moment Correlations for Students' Perceived SAE Participation (N = 57)

Variable	X_1	Y
SAE Participation (X_1)	1.00	.31
Perceived level of SAE participation (Y)		1.00

Conclusions, Implications and Recommendations

Students with secondary FFA experience were more likely to be retained following their freshman year within the California State University, Chico College of Agriculture than their peers who did not participate in FFA at the secondary level. This finding supports previous research of Garton et al. (2002), Ball et al. (2001) and Dyer et al. (2000). This finding also supports the involvement component of Astin's (1999) retention model. The consistent findings supporting greater retention of students with FFA experience merits examining admission criteria. The College of Agriculture should encourage and recruit students with FFA experience. With current budget constraints, enrollment decisions may be even more crucial for colleges of agriculture. The California State University, Chico College of Agriculture should continue to follow participants in this study to determine if retention following the freshman year is indicative of successful completion of baccalaureate degrees for these students. Will FFA experience allow students to complete a degree in fewer semesters than their peers? Should FFA experience be considered an external factor, as described by Bean (1983) which contributes to retention? What other factors may contribute to college retention of former FFA members? Additionally research should be conducted to examine personal attributes of former FFA members to determine the variance in college persistence accounted for by FFA membership.

FFA activities and experience vary drastically in this population. However, it is important to consider that incoming students in the College of Agriculture at California State University, Chico were most likely to participate in FFA conferences. This finding should be used to assess current recruitment practices and support for FFA activities. More specifically, these finding should be shared with all faculty members in the college of agriculture to increase support for FFA activities offered by the university. The lack of participation in FFA activities such as the Agri-Science fair contest should be evaluated by FFA personnel. Perhaps the college of agriculture should offer additional support to encourage more students to participate in Agri-Science contests.

Grade point average was not predictive by participation in secondary FFA activities. Students with FFA experience were not statistically different in academic success, as measured by their first year GPA. These findings are similar to Garton et al. (2002) and Dyer et al. (2000). It does not appear accounting for the level of participation in FFA contributed to academic success of first year college students. However, these findings present additional questions which should be the subject of additional research. Would students with FFA experience demonstrate a greater need for social activities during the transition to college and if so, would these activities impact their academic success? Are students with FFA experience more likely to become involved in clubs or student government and if so, could this involvement affect their academic performance? Are students in the College of Agriculture at California State University, Chico without FFA experience more likely to graduate from secondary programs which do not offer agriculture courses? Would non-FFA students majoring in highly competitive academic programs, such as pre-veterinary studies, have a higher GPA than other non-FFA students?

While summated FFA activities varied greatly in this population, a positive, substantial and statistically significant relationship existed between their summated activities and their self-perceived beliefs of FFA involvement. However, this relationship failed to show a strong relationship, which suggests there is some discrepancy between the number of activities in which FFA members participate and their perceived involvement. If involvement contributes to college retention as suggested by Astin (1999), this apparent discrepancy may of interest for future research. Would students with FFA experience perceive themselves as highly involved in the college of agriculture? If FFA participation increased, would the level of involvement at the collegiate level also increase and would this impact college retention?

While FFA participation appeared to impact student retention, self-reported SAEs failed to show a significant relationship with student retention. Similarly, SAEs were not found to significantly contribute to academic success of first year students in the college of agriculture, as measured by GPA. The value of secondary SAE student experiences are well documented. Therefore, these findings are somewhat surprising. However, could SAEs at the secondary level contribute to academic success if viewed through the lens of college completion? Will a greater number of students with secondary SAEs complete college in fewer semesters than their peers who lack SAEs? Nearly two-thirds of freshman students had SAEs at the secondary level and over half of these students were involved in market livestock projects. Although California state agricultural education data suggests the number of agricultural classes offered in agricultural mechanics is 40%, only 14 % of students in the college of agriculture at California State University, Chico reported SAEs in this area. This discrepancy should be examined and compared to other agricultural courses. Further research should seek to quantify the importance of SAE experience for students enrolling in post-secondary colleges of agriculture. The role and importance of SAEs needs to be documented and, if relevant, provide quantitative data to support the inclusion of this experiential learning model in secondary agricultural programs. These findings are similar to those of Dyer and Osborn (1996) who suggested experimental studies were needed to assess the value of experiential learning in SAE programs.

The retention of students in colleges of agriculture needs to be examined with greater importance given the declining enrollments faced by many post secondary agricultural programs. If participation in secondary FFA experiences increases the retention of students following their first year of college, efforts should be made to recruit and enroll students demonstrating FFA experience. Given the increasingly competitive enrollment criteria for the California State University, Chico College of Agriculture, admissions criteria should be examined to ensure admitted students will be retained by the college.

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Agriscience Teachers' Concern Profiles for Content Area Reading Strategies

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Although students today will need to rely on text more than in the past, American students are struggling to read and comprehend text. Research has supported the ability of content area reading strategies (CARS) to increase students' ability to read and comprehend text. The purpose of this research was to assess agriscience educators' implementation of CARS in their classrooms. A descriptive, census survey of 371 Florida agriscience teachers was completed using a tailored-design, web-based questionnaire. Overall, agriscience teachers' Stages of Concern profiles were non-user profiles. The researchers concluded CARS professional development programs are not meeting the needs of agriscience teachers; thus, these teachers are not progressing through the Stages of Concern and are not implementing CARS at a high level. Research should be completed to develop an Innovation Configuration which would provide a more unified vision for CARS implementation. Practitioners should develop and provide a consistent, in-depth professional development program should be implemented to provide ongoing training and support of the innovation throughout a several year process.

Introduction

Over a 20 year period, the College Board (2002) statistics showed a 23 point increase in mathematics scores on the SAT while the verbal scores remained the same. The U.S. Department of Education has reported over eight million struggling readers in the United States between fourth and twelfth grade (2003). U.S. students have ranked toward the bottom of an international comparison of reading proficiency even below students from developing countries (Snow, 2002). These statistics have prompted a number of state and national reading initiatives.

The No Child Left Behind (NCLB) Act has mandated a major change across the nation in education, and a large section of the NCLB Act has focused on improving student literacy. A statement by then U.S. Secretary of Education Paige (2001) noted the ability of this legislation to help meet the needs of America's students and to provide a quality education to all students. However, Mapping America's Educational Progress 2008, a report published by the USDE to measure the accountability of NCLB, highlighted continuing literacy problems. Only about 30% of fourth and eighth grade students performed at the proficient reading level. Those numbers decreased significantly for students of low socioeconomic status and different ethnicities. Two percent of the same students performed below basic levels. Since 2002 these students have made steady improvements in math scores. However, fourth graders have improved their reading scores minimally and eighth graders' reading scores have slightly declined. The Mapping Florida's Progress 2008 report shows that Florida's students rank below the national average for reading achievement.

Referring to The College Board's (2002) report on the ten-year trend of SAT scores, Scherer (2002) stated "educators must take a long-range view in balancing student needs as they implement the much needed national initiatives" (p.5). She noted an emphasis on mathematics and science aided in increasing math scores; however, the narrow focus on reading limited the improvement of verbal scores. Reading programs have focused on early literacy with little attention given to reading comprehension beyond primary grades (Allington, 2002). Researchers underscored the importance reading comprehension and reading in the content area play in communication, education, employment, and citizenship (Meltzer, 2001; Vacca, 2002a). Students will need to be taught new literacy skills so they can learn how to comprehend reading materials "Reading and writing play a crucial role in the ability to 'learn for understanding'" (Meltzer, p. 1).

William S. Gray, one of the first prominent reading educators and researchers, conceptualized content area reading in the *Twenty –Fourth Yearbook of the National Society for the Study of Education, Part One* (Whipple, 1925 as cited in Vacca, 2002b). Gray believed reading was necessary in all content areas and identified content area reading instruction as a characteristic of good teaching.

The issue of adolescent literacy continues to demand attention. The Commission on Adolescent Literacy of the International Reading Association emphasizes the importance of adolescent literacy:

> Adolescents entering the adult world in the 21st century will read and write more than any other time in human history. They will need advanced levels of literacy to perform their jobs, run their households, act as citizens, and conduct their personal lives. They will need literacy to cope with the flood of information they will find everywhere they turn. They will need literacy to feed their imaginations so they can create the world of the future. In a complex and sometimes even dangerous world, their ability to read will be crucial. Continual instruction beyond the early grades is needed (Moore, Bean, Birdyshaw, & Rycik, 1999, p. 3).

The point in school when students have been expected to use higher level thinking to extract information from text with unfamiliar structure, organization, vocabulary, and syntax has been the same time they have stopped receiving reading instruction (Allington, 2002; Meltzer, 2001Scherer, 2002; Vacca, 2002a). Although responsibility for reading instruction has fallen on English teachers in the past, students require reading instruction from other teachers as well (D'Arcangelo; Vacca, 2002a; Vava 2002b). Content teachers should help students learn how to learn in their specific disciplines by equipping them with strategies which would aid them in reading comprehension and in becoming effective learners (D'Arcangelo; Scherer, 2002).

Competent readers utilized suitable readings skills to develop a comprehension of the topic (Vacca, 2002a). Reading in the content area required students to interact with reading material before, during, and after reading (Literacy Matters, 2008). Comprehension of text also requires students to understand the literal meaning of the text, make inferences, and evaluate the material. All content area teachers could help meet the comprehension needs of students by incorporating Content Area Reading Strategies (CARS) instruction throughout all content areas (Fisher & Ivey, 2005; Literacy Matters 2002; Scherer, 2002). Teachers who equip their students with suitable reading level material and reading strategy instruction have more successful students (Allington, 2002; Literacy Matters, 2002). Fluent readers have learned to become strategic readers when their teachers have embedded reading instruction and model reading strategies into the curriculum (Bryant, Ugel, Thompson, &Hamff, 1999; Vacca, 2002a). D'Arcangelo (2002) noted CARS can be embedded easily into all content areas.

Content area teachers have often overlooked the importance of incorporating CARS into content instruction (D'Arcangelo, 2002). Early in CARS research, O'Brien and Stewart (1990) found of the pre-service content area teachers in their study, agricultural educators were the most resistant towards implementing classroom reading; eighty-five percent of the pre-service agricultural educators rejected content area reading. Meltzer (2001) highlighted the importance of using discipline-specific CARS. Park and Osborne (2006a) noted the major obstacle to CARS implementation in agriscience was the teachers' lack of knowledge and confidence. Further, Park and Osborne (2006b) concluded that agriscience teachers cannot identify specific CARS to implement in their curricula. Continuing professional development and support for teachers has been suggested by research as being instrumental to successfully implement and sustain CARS instruction (Vacca, 2002a; Vacca 2002b).

A roundtable discussion at the National Agricultural Education Inservice emphasized the ability of agriscience teachers to capitalize on students' motivation to learn the content of agriculture courses in order to teach reading strategies which students can transfer to lifelong literacy skills (Park, 2008). Fisher and Ivey (2005) also recognized content reading as "a way to engage students in the content at hand" (p. 6).

School systems have invested substantial time and money into professional development and initiatives focused on improving student literacy. A need to determine the effectiveness of CARS professional development and level of CARS utilization in agriscience exists (Park & Osborne, 2006b). Documentation of implementation must be achieved before the success of a program can be evaluated (Hall & Hord, 2006). Have The CARS professional development programs met the needs of agriscience teachers? Are agriscience teachers incorporating CARS into their curriculum? The problem under investigation in this study was, are agriscience teachers implementing CARS into instruction in order to address the low reading performance of students?

Literature Review/Theoretical Framework

In a pre-and post-interview study, Bryant, Ugel, Thompson, Hamff, and Hougen (2001) identified the following areas of needed professional development for CARS: word identification, partner reading, collaborative strategic reading, modeling, supporting meetings, and teams. The researchers recommended developing a shared understanding of content literacy goals to guide professional development. Masten, Stacks, Priest, Scott, and Vitale (1999) found that middle school teachers who attended a three hour CARS training utilized significantly more reading comprehension strategies than teachers in the control group who attended a 3 hour behavioral principles workshop.

Aneke and Finch (1997) researched educational reform and found, "the intensity and stages of the teachers' concern profiles changed when teachers were grouped according to hours of reform-related training" (p. 10). They recommended that teachers with minimal training in an innovation be provided additional training to gain exposure to the innovation at hand. They noted, "reform-related in-service training has great potential to serve as an effective method of exposing teacher to the reform experience" (p. 11-12). The researchers noted that such training should help teachers move from lower level concerns to higher level concerns; however, these workshops must first address the personal concerns of the teachers.

Baker, Gertsen, Dimino, and Griffiths (2004) identified ongoing professional development and support as an influential variable for sustained use of an educational innovation. They identified three key components to an innovation model that led to successful implementation: 1) an initial training that developed the *big picture*, 2) use of continued, on-site support from trained graduate students for the first five years of the innovation, and 3) investment of funds to provide logistical support for the innovation. Baker et al. made several conclusions about the success of professional development and an innovation. First, they noted the importance of using professional development to "[enhance] teaching rather than asking teachers to substitute radically new teaching methods for current ones" (p. 20). This approach eased the change process by allowing teachers to maintain autonomy in their teaching.

Additionally, ongoing professional development and logistical support contributed to the success of the innovation. Finally, the professional development should develop teachers' conceptual and procedural knowledge.

The Concerns-Based Adoption Model (CBAM) (Hall & Hord, 2006) was chosen as the theoretical base of this study because it has been based on 35 years of research focused on educational change, it has been extended and tested in different settings, and it is recognized as one of the strongest models for educational change (Hall & Hord; Anderson, 1997). The Concerns-Based Adoption Model was designed to help facilitate change and provide diagnostic means of measuring implementation of an innovation (Hall & Hord). The model consists of the environment, the user system culture, resource system, change facilitator team, interventions, users and nonusers, and three diagnostic measures: stages of concern, levels of use, and innovation configurations (Hall & Hord).

Stages of Concern (SoC) is one of the diagnostic instruments of the CBAM which addresses the affective side of change (Hall & Hord, 2006). The feelings and perceptions of participants are known as concerns. The development of the SoC has been based on research of the evolution of concerns through the change process. The SoC define a progression of concerns which people move through as they implement an innovation. Focused workshops, individual coaching sessions, and strategic plans can be designed upon the SoC of participants to more effectively facilitate change.

Based on Fuller's (1969) identification of concerns, Hall and Hord (2006) have developed seven Stages of Concern. George, Hall, and Stiegelbauer (2006) offered the following definitions for each of the Stages of Concern:

> **0 Awareness:** Little concern about or involvement with the innovation is indicated.
> **1 Informational:** A general awareness of the innovation and interest in learning more detail about it is indicated. The person seems to be unworried about himself/herself in relation to the innovation. She/he is interested in substantive aspects of the innovation in a selfless manner, such as general characteristics, effects, and requirements for use.
> **2 Personal:** [The] individual is uncertain about the demands of the innovation, his/her inadequacy to meet those demands, and his/her role with the innovation. This includes analysis of his/her role in relation to the reward structure of the organization, decision-making, and consideration of potential conflicts with existing structures of personal commitment. Financial or status implications of the program for self and colleagues may also be reflected.
> **3 Management:** Attention is focused on the processes and tasks of using the innovation and the best use of information and resources. Issues related to efficiency, organization, managing, scheduling, and time demands are utmost.
> **4 Consequences:** Attention focuses on impact of the innovation on clients in his or her immediate sphere of influence. The focus is on relevance of the innovation for clients, evaluation of outcome including performance and competencies, and changes needed to increase client outcomes.
> **5 Collaboration:** The focus is on coordination and cooperation with others regarding use of the innovation.
> **6 Refocusing:** The focus is on the exploration of more universal benefits from the innovation, including the possibility of major changes or replacement with a more powerful alternative. [The] individual has defined alternatives to the proposed or existing form of the innovation (p. 8).

Research has shown "there is a quasi-developmental path to the concerns as the change process unfolds" (Hall & Hord, 2006, p. 141). Although, they stated that neither the progression of concerns nor the direction of the progression is guaranteed. When proper conditions exist (i.e. appropriateness of change, proper involvement from leaders, and effective facilitation) participants move from Stages 1 & 2 to Stage 3 during the first couple years, and ideally they will move to Stages 4 & 5 around three to five years into implementation. Undesirable conditions can cause participants to cease progression or regress. Hall and Hord (2006) highlighted, SoC "reflect the idealized, developmental approach to change" (p. 142).

Anderson (1997) explains, "CBAM theory idealizes the Stages of Concern as a developmental progression in which teachers implementing a change have concerns of varying intensity across all seven stages at different points in the change process" (p. 334). However, teacher concern may not progress through all stages in the suggested order.

The Stages of Concern Questionnaire (SoCQ) is the most rigorous and reliable form of SoC assessment (Hall & Hord, 2006). It has been revised to address some of the concerns of the previous instrument and to reestablish its validity (G. Hall, personal communication, June 19, 2008). The assessment consists of 35 Likert type questions and is noted for being psychometrically sound and easy to take (Hall & Hord). Hall and Hord also recommend adding an open-ended concerns statement to the end of the questionnaire to ensure that all possible concerns can be expressed. From the results, SoC profiles can be developed. The strengths of the instrument include the strong reliability and validity of the instrument and the ability to develop concerns profiles. The main disadvantage of the SoCQ is participants' lack of willingness to complete it. Hall and Hord recommended this assessment for formal evaluation efforts and encouraged facilitators and evaluators to use this technique a maximum of two to three times a year.

Hall and Hord (2006) identified twelve principles of change which have emerged from CBAM research. These principles have been supported with enough evidence to be considered valid in all cases of change. The individual principles are not mutually exclusive and only cover certain aspects of change. Hall and Hord outlined the following principles of change:

1: Change is a process, not an event.
2: There are significant differences in what is entailed in development and implementation of an innovation.
3: An organization does not change until the people within it change.
4: Innovations come in different sizes.
5: Interventions are the actions and events that are key to the success of the change process.
6: There will be no change in outcomes until new practices are implemented.
7: Administrator leadership is essential to long-term change success.
8: Mandates can work.
9: The school is the primary unit for change.
10: Facilitating change is a team effort.
11: Appropriate interventions reduce resistance to change.
12: The context of the school influences the process of change (p. 4-14).

These principles must be understood to comprehend the components of CBAM (Hall & Hord).

Purpose and Objectives

The purpose of this research was to assess agricultural educators' implementation of content area reading strategies (CARS) in their classrooms. In order to meet the purpose of this study, the following objectives were investigated:

1. Ascertain agriscience teachers' CARS professional development history.
2. Determine the Stages of Concern of agriscience teachers who have completed CARS professional development program.
3. Determine the Stages of Concern of agriscience teachers who have not completed CARS professional development program.

Methodology

A descriptive census survey design was used in this study. The researcher used a web-based questionnaire to collect the concerns of Florida agriscience teachers towards the implementation of content area reading strategies (CARS). The population for this study was Florida agriscience teachers. The researcher obtained a list of current Florida agriscience teachers (*N*= 371) from the 2008 Florida Agricultural Education Directory which served as the population frame (Myers & Warner, 2008). The 2008 Florida Agricultural Education Directory was chosen as the population frame because it functioned as the only updated, comprehensive list of Florida agriscience teachers.

The researcher utilized the Stages of Concern Questionnaire (SoCQ) developed by George, Hall, and Stiegelbauer (2006). This questionnaire was composed of 35 Likert-type questions that assessed the concerns of the individuals involved in the educational innovation change process – the integration of Content Area Reading Strategies (CARS). This questionnaire allowed respondents to indicate the relevance and intensity of their concerns towards CARS. In addition to the Likert questions, a free-response question allowed participants to express their concerns in their own words, as recommended by Hall and Hord (2006) and G. Hall, personal communication (2008). In addition to the SoCQ, the researcher included several questions to determine the CARS professional development history of the teachers. Teachers were asked to indicate if they had completed different levels of training, give the numbers of hours spent in each training, and provide a brief description of the training. Lastly, demographic questions were included to better understand the population.

George, Hall, and Stiegelbauer (2006) stated that validity testing of the SoCQ has been performed by testing the relationship of the scales to one another and to variables from other concerns theories. George et al. utilized correlational matrices and factor analysis to determine "the seven scales [in the SoCQ] tapped seven independent constructs that could be identified readily with the seven Stages of Concern proposed by the Concerns-Based Adoption Model (CBAM)" (p. 14). George et al. reported coefficients of internal reliability for each of the seven Stages of Concern which ranged between an alpha of .64 and .83, for the Stages of Concern Questionnaire. Santos (1999) stated an alpha score of .7 or greater is acceptable. George et al. also reported test-retest correlations for the SoCQ, which ranged between $r = .65$ and $r = .86$. These reported reliability scores fall within the acceptable range of reliability estimates as stated by Santos with the exception of Stage 0. Stage 0 has been under revision to help improve the reliability (Hall & Hord, 2006; George et al., 2006).

Upon IRB approval, the researcher proceeded with the survey using Dillman's (2007) Tailored Design Model for survey collection. In order to analyze the data from this study, the researcher used Statistical Package for the Social Sciences (SPSS) 17.0 for Windows. Descriptive statistics, including frequencies and central tendencies, were used to analyze the concerns of agriscience teachers towards CARS.

Additionally, the Microsoft Excel SOCQ-075 Graph and Print program was used to create an overall concerns profile for the group and sub-groups (Scott & Persichitte, 2006). To address objective one, assessing the teachers' CARS professional development history, SPSS was utilized to calculate frequencies and central tendency statistics. To address objectives two and three, the researcher used the Microsoft Excel SOCQ-075 Graph and Print program to determine the concern profiles for teachers with CARS professional development training and those without training.

These findings were part of a larger study in which a total of 371 online questionnaires were sent to the population via a web link sent in an e-mail to agriscience teachers in the state of Florida. The completion of 214 questionnaires provided a response rate of 57.7% ($n = 214$). Dillman (2007) encouraged addressing nonresponse error in all survey-based research studies since the potential for nonresponse error exists in all survey research. Because it would be challenging to address the Stage of Concern variable in a brief phone survey with nonrespondents, concern profiles were created to compare early respondents and late respondents. Research has shown that similarities usually exist between late respondents and nonrespondents (Ary, Jacobs, Razavieh, & Sorensen, 2006). Pace (1939) found that nonrespondents and respondents are similar. These similarities allow for researchers to estimate the responses of nonrespondents based upon late respondents. Thus, early and late respondents were compared to address nonresponse error. Participants who responded to the cover letter with the first link to the survey, before the reminder e-mail was sent were categorized as early respondents ($n = 66$). Those who responded after the final contact was made were defined as late respondents ($n = 42$). Both of the profiles were non-user profiles; however, the early responders had higher intensity concerns than the late responders across all stages.

Post hoc reliability (Table 1) was calculated with SPSS using Cronbach's Alpha for each SoC. Santos (1999) stated an alpha score of .7 or greater is acceptable. Although the reliability scores were slightly low in Stages 0 and 1, they were similar to other studies (George et al., 2006). Stage 0 has been under revision to improve reliability (Hall & Hord, 2006; George et al., 2006).

Table 1. Post hoc reliability scores for each stage of concern ($N = 214$)

Stage	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Alpha	.57	.67	.78	.78	.71	.78	.71

Findings

Objective 1: Ascertain agriscience teachers' CARS professional development history: Teachers were asked to indicate their participation in a range of CARS professional development experiences, which included: pre-professional, continuing education, training with reading coach, school training, county training, Florida Reading Initiative training, or other training (Table 2). The majority of teachers surveyed (75.9 %; $n = 104$) had participated in school training for CARS and at least half of the respondents had participated in continuing education course work, pre-professional course work, county training, and personal reading coach training regarding CARS. Only about one fourth of the respondents had participated in Florida Reading Initiative training or other CARS professional development.

Table 2. Teacher participation in CARS professional development

Training	*n*	*f*	%
School	137	104	75.9
Continuing education	140	88	62.9
Pre-professional	144	81	56.3
County	133	73	54.9
Reading coach	142	75	52.8
Florida Reading Initiative	104	28	26.9
Other	96	26	27.1

Note. f = frequency.

Teachers were asked to specify the total hours they had devoted to each professional development experience in which they had participated (Table 3). On average, teachers devoted the highest number of hours (M = 24.06, SD = 13.00) to Florida Reading Initiative training. Teachers spent the fewest number of hours (M = 14.43, SD = 11.838) training with their reading coach. The total number of hours participants reported in the different types of professional development programs were added to determine the total number of professional development hours. The mean total number of CARS professional development hours completed was 60.56 with a standard deviation of 52.20. The range was 312.

Table 3. Number of hours teacher devoted to CARS professional development

Training	*n*	Min.	Max.	M	SD
Florida Reading Initiative	35	0	>30	24.06	13.00
Pre-professional	73	0	>30	22.51	12.75
Continuing education	88	0	30	21.30	11.65
Other	22	0	>30	20.14	13.28
County	72	0	>30	16.44	11.39
School	99	0	30	14.58	10.95
Reading coach	77	0	>30	14.43	11.89

Note. Min. = minimum; Max. = maximum.

Objective 2: Determine the Stages of Concern of agriscience teachers who have completed a CARS professional development program: An overall concerns profile (Figure 1) was developed to illustrate the concerns of the population regarding implementing CARS into the agriscience classroom. *Unconcerned* was the primary stage of concern with a percentile score of 91. Informational, personal, and management concerns were relatively high. The lowest SoC was consequences, followed by collaboration and then refocusing.

A group concerns profile was developed for teachers who reported receiving CARS professional development (Figure 1). The primary SoC for the group concerns profile was Stage 0, *unconcerned*, with a 96th percentile score. The secondary SoC for this group was *management*, Stage 4, with an 80th percentile score. These teachers also had high concerns in the informational and personal stages. Their lowest SoC was consequences with a 33rd percentile score. Collaboration and refocusing scores for this group were around the 50th percentile.

Objective 3: Determine the Stages of Concern of agriscience teachers who have not completed a CARS professional development program: A group concerns profile was created for teachers reporting having no CARS professional development (Figure 1). The primary SoC for this group was *unconcerned*, Stage 0, with a 91st percentile score. This concern was followed by *informational*, Stage 1, and *management*, Stage 4, both with an 88th percentile score.

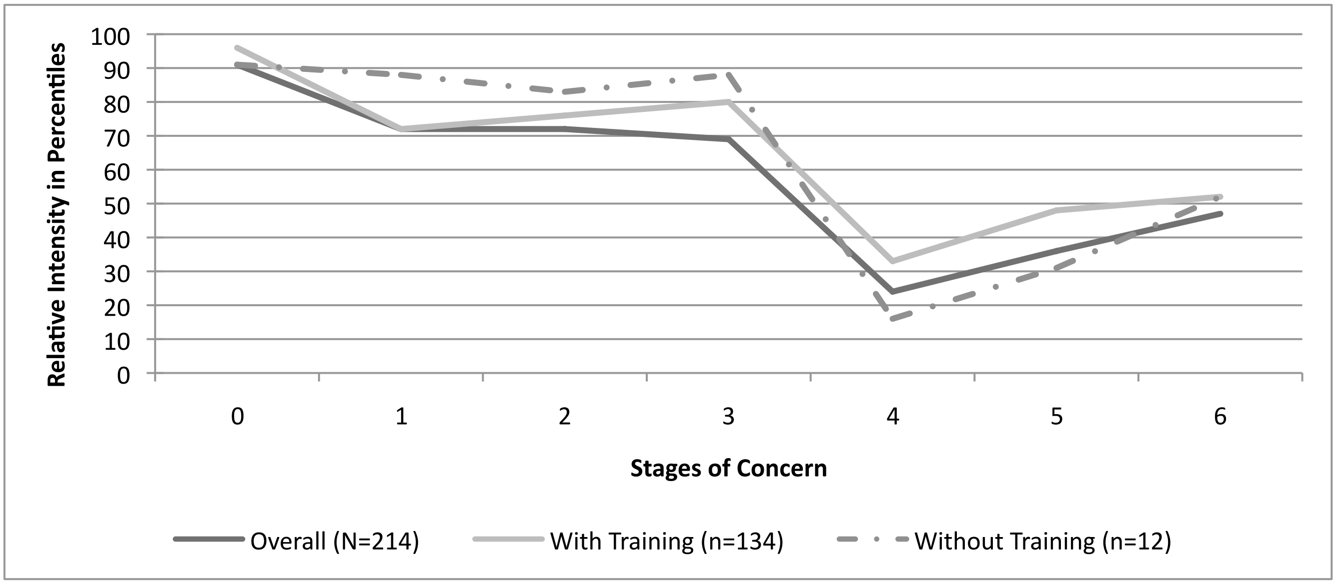

Figure 1. CARS concerns profiles

Conclusions & Recommendations

Conclusion 1: The overall concerns profile for agriscience teachers is a non-user profile: According to George, Hall, and Stiegelbauer (2006), the overall concerns profile was that of a *typical nonuser*. Figure 2 illustrates the common user profiles and their hypothesized progression. When evaluating group data, one must consider that it will be affected by "dominant high and low Stages of Concern" (George et al., 2006, p. 34). Based upon the overall profile, as a whole, respondents were not entirely aware of the innovation or focused on other innovations and obligations. However, relatively high scores in Stages 1 and 2 indicated a possible interest in learning about the innovation. Teachers were not intensely concerned about consequences or collaboration with this innovation. The *tailing-up* of the profile at Stage 6 signified that the teachers may have other ideas which they think deserve more time and attention and that they may be resistant to change.

Hall and Hord (2006) underscore, "the crucial step in using [concern profiles is] to make *concerns based interventions* that will be able to resolve the concern and move the person toward more advanced use of the innovation" (p.142). Continued interventions and support should be utilized to assess and address teacher resistance and to help these teachers progress through the implementation of CARS. Until the teachers have fully implemented CARS, no research on the effectiveness or student outcomes can be completed, because there will be no change in outcome until there is a change in behavior (Hall & Hord,).

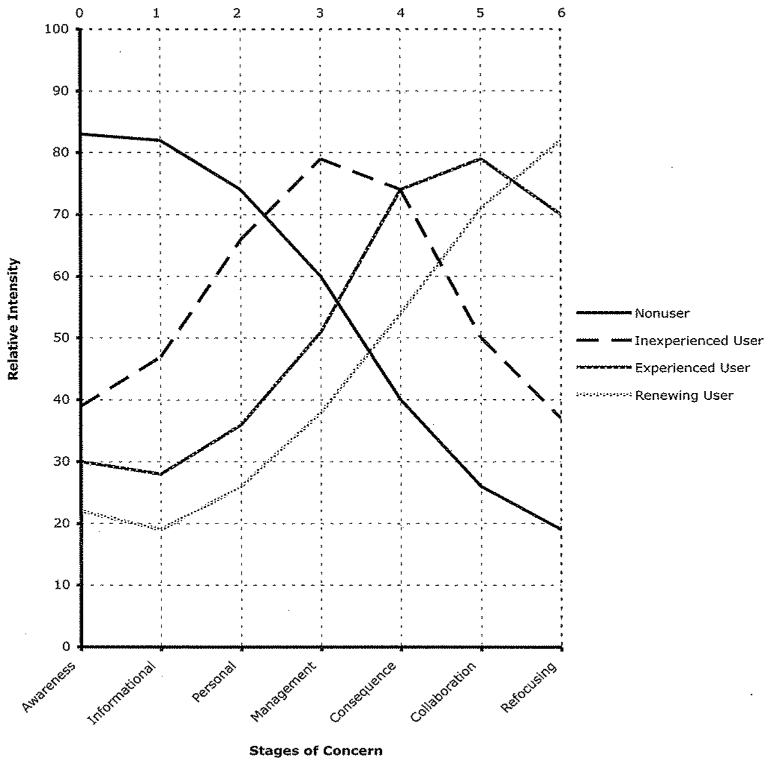

Figure 2. Hypothesized development of Stages of Concern (George et al., 2006, p.36).

Conclusion 2: In general, agriscience teachers show resistance to the CARS innovation: A majority of the group concerns profiles had a *tailing-up* of Stage 6 which in a non-user profile indicates a resistance to change (George, Hall, & Stiegelbauer, 2006). George et al. states that when the tail increases more than 10 percentile points, it should be considered an alarm.

Since agriscience teachers interact often through various regional, state, and national events, they have a unique user system culture which affords them the opportunity to discuss current educational problems or innovations. This time allows for constructive or destructive mushroom interventions to emerge. If teachers who disapprove of the innovation take the opportunity to express their disproval and persuade others against the innovation, it could be detrimental to the innovation. On the other hand if teachers use the time to support the innovation and collaborate, the interaction between these teachers could support the implementation of CARS.

Change Principle 11 notes, "appropriate interventions reduce resistance to change" (Hall & Hord, 2006, p. 13). Hall and Hord define interventions as "various actions and events that [change leaders] and others take to influence the [change] process" (p. 8). They suggest that change facilitators need to identify one of three reasons for resistance so each may be addressed through an appropriate intervention either individually or within the whole group. Research and interventions should assess and address the cause of agriscience teachers' resistance. Possible sources may be attitudes, knowledge, philosophy, perceptions and conceptions, and motivation. If professional development addresses the causes of resistance before covering the strategies, teachers may be much more attentive and willing to implement CARS.

Conclusion 3: Agriscience teachers are not focused on the consequence of implementing CARS or the potential for collaboration: The consequence SoC was consistently the lowest SoC which indicates, agriscience teachers do not realize how the implementation of CARS will affect students' learning. An understanding of the direct benefits of CARS to students and teachers may lower awareness scores and increase consequences scores. Professional development programs should focus on marketing the benefits of CARS implementation to the teachers. Teachers might then recognize CARS as a valuable teaching tool rather than another mandate.

Collaboration concerns were also scored consistently low. If teachers are not collaborating, they are missing opportunities to share applications of CARS. Change Principle 9 asserts, "the school is the primary unit for change" (Hall & Hord, 2006, p. 12). Although change must first occur in the individual, successful organizational change must occur on a school level. For school-wide change to occur, collaboration is required among teachers and between the teachers and the change facilitator team. Collaboration should be encouraged to foster implementation. By learning from each other and sharing their experiences teachers could decrease concerns in the informational, personal, and management stages and increase concerns in consequence stages. Research should investigate the effects of teacher collaboration on progression through the Stages of Concern and the implementation of CARS. Professional development programs and school systems should focus on ways to foster collaboration, such as a wiki or newsletter.

Conclusion 4: CARS professional development programs are not meeting the needs agriscience teachers; thus, these teachers are not progressing through the Stages of Concern and are not implementing CARS at a high level: The group concerns profile developed for teachers who had not completed CARS professional development is a nonuser profile with an additional peak at Stage 3 and a *tailing-up* of Stage 6. According to descriptions provided by George, Hall, and Stiegelbauer (2006), teachers in this group are likely more concerned with something other than the implementation of CARS and possessed high managerial concerns. Consequences and collaboration were both of low concern. This profile also had a strong *tailing-up* of over 20 percentile points. George et al. (2006) noted that this may show strong resistance to the innovation and suggested it be "heeded as an alarm" (p. 42).

Based on George, Hall, and Stiegelbauer's (2006) description of concern profiles, several conclusions can be drawn about the group concern profile of teachers completing CARS professional development. The high relative intensity score for Stage 0 indicated that teachers were more concerned about other responsibilities or innovations. The second peak at Stage 3 identified the strong management concerns, such as time and logistics. This profile indicated low interest in consequences of CARS and mild interest in collaboration on CARS. The *tailing-up* of the concerns profile at Stage 6 revealed that teachers had ideas about changing the innovation and may be resistant to the implementation of CARS. However, the *tailing-up* in this profile was slight and should not cause great concern.

According to George, Hall, and Stiegelbauer (2006) low scores in Stage 0 are indicative of individuals who view the innovation as important to his or her work. On the other hand, high scores indicate that other innovations or consideration are of greater importance to the teacher. This explanation of the awareness concern can explain the consistently high awareness SoC. Agriscience teachers have many responsibilities and have not bought into the CARS innovation. They may view the innovation as just another mandate which adds to their work load. Reform-related trainings should address the personal concerns of the participating teachers (Aneke & Finch, 2001). By administering the Stages of Concern

Questionnaire prior to a professional development program, instructors can assess and address the concerns of the participants through the training. Hall and Hord (2006) recommend using open-ended concerns statements before and after professional development programs to identify, target, and assess development of teachers' Stages of Concerns through the program which should increase the quality and effectiveness of the professional development. Baker et al. (2004) suggested making a smooth and gradual transition so that the innovation *enhances* teaching instead of asking teachers to make a drastic change in the teaching methods. Specifically, CARS professional development for agriscience teachers should focus on the areas those teachers have identified: "where, how, and why to use CARS in their agriscience courses" (Park, 2005, p. 138-139).

Based on this study, the researcher suggests that practitioners consider the following recommendations:

1. A consistent, in depth professional development program should be implemented to provide ongoing training and support of the innovation throughout a several year process.
2. Schools should utilize Stages of Concern questionnaires and interventions to identify and attend to concerns which need to be addressed by professional development.
3. Professional development trainers should address the Stage 6 concerns in order to decrease resistance to the innovation.
4. School systems and school systems should encourage teacher collaboration to foster CARS implementation.

This study has identified the need for research in the following areas:

1. Research should be completed to develop an Innovation Configuration which would provide a more unified vision for CARS implementation.
2. Research should be conducted to verify the concern profiles developed in this study.
3. In order to better understand the effectiveness of the professional development programs, research should be conducted to determine the characteristics and effectiveness of various CARS professional development programs to design more effective and efficient programs.
4. Research should be conducted on the types of interventions agriscience teachers receive for CARS implementation and the effects of the identified interventions.
5. Researcher should identify the sources of resistance agriscience teacher have about CARS.
6. Research should investigate the effects of teacher collaboration on progressing through the Stages of Concern and the implementation of CARS.
7. Research on the outcomes of CARS should not be performed until successful implementation can be documented.

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Outcomes of Integrated Agriscience Processes: A Synthesis of Research

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Abstract

As the trend to integrate science and agriculture education has reemerged, so has the research related to the integration of science into secondary agricultural education. The American Association of Agricultural Education responded to this trend by creating a special interest group called "Strengthening Academic Learning through Agricultural Education." In 2005, Myers and Osborne developed the "Conceptual Model for Strengthening Academic Learning through Agricultural Education" to guide this group in identifying existing gaps in the literature and to help provide a directional path for future research. The purpose of this study was to use this conceptual model to review research, to make conclusions regarding the outcomes of efforts to integrate science and secondary agricultural education, and to identify gaps in the existing research. This synthesis identified several areas of research deficiencies pertaining to integrated agriscience student products including student retention, college placement, and selection of an agriscience field as a career. In addition little research was found pertaining to the integrated agriscience teacher products of teacher ability and their involvement in professional development. Recommendations and future questions for integrating science and agricultural education were posed by the authors.

Introduction

The integration of science and agricultural education has been inspired by educational reform legislation since the late 1880s. Hillison (1996) suggested that the American agriculture industry was experiencing a scientific revolution at this time and farmers were seeking scientific data to aid them in farming. As a result of their demands, the Hatch Act of 1887 was created to provide federal funds for scientific research to increase the productivity of farming.

As this scientific revolution was occurring in agriculture, a need was created for in-depth agricultural education to teach adult farmers as well as youth about new farming methods. To meet this need, the Smith Hughes Act of 1917 established agricultural education in American public secondary schools. As a result, agricultural education programs began to focus more on vocational training than the distribution of scientific agricultural data (Hillison,1996). Even though vocational skill training was the point of emphasis during the early and mid 1900s, the idea of integrating biology principles into vocational agriculture was still acknowledged by researchers and practitioners in agricultural education as demonstrated by experimental research from Starling & Bender (1965).

In the early 1980s, the trend to integrate science and agriculture in the high school agricultural education program reemerged (Phipps, Osborne, Dyer & Ball, 2007). In 1983, a report from the National Commission on Excellence in Education titled *A Nation at Risk* revealed that Americans performed poorly in basic science (National Commission on Excellence in Education, 1983). In response to the *A Nation at Risk* report, the National Commission on Secondary Vocational Education made six recommendations pertaining to curriculum in *The Unfinished Agenda: The Role of Vocational Education in High School* (National Commission on Secondary Vocational Education, 1984). Two of the six recommendations dealt with integration; and schools were encouraged to teach basic academic skills in vocational education. Even though this report recommended the integration of academic and vocational education, no specific methods or models for implementing integration were suggested (Stecher, et al., 1994).

In 1988, the National Research Council in *Understanding Agriculture: New Directions for Education* stated that the content of many agricultural education programs was found to be outdated and based on production agriculture. The report also identified integrated agricultural education as one solution for the national concern over inadequate science education in the United States. Recommendations for improving agricultural education in this report included revising curriculum to include the application of concepts from physical and biological science (National Research Council, 1988).

The Carl D. Perkins Vocational and Applied Technology Education Act Amendment of 1990 was the first major piece of federal legislation encouraging educators to shift away from the traditional job skills orientation of vocational education and move toward the use of vocational education to teach academics and other forms of thinking skills (Stecher et al., 1994). One of the key practices of the Perkins' initiative was the integration of vocational and academic curriculum (Miller, 1997). Since 1990, reauthorizations of the Perkins legislature has included funding for competitive challenge grants through the United States Department of Agriculture to recruit and meet the educational needs of students who will work in agriculture and possess scientific and professional expertise (US Department of Agriculture, 2009). In a final report to the US Congress regarding the 1998 Carl D. Perkins Vocational and Technical Act (Perkins III), the United States Department of Education (2004) recommended using curriculum development as a strategy to strengthen student academic performance and to improve vocational program performance.

Team AgEd in the *2005-2006 Annual Report on Agricultural Education* committed to pursuing the goal to create 10,000 agricultural programs in the United States (Team Ag Ed, 2007). One of the initiatives as a result of this goal was to align secondary science curriculum with the national science standards in the newly created Curriculum of Agricultural Sciences Education (CASE). This curriculum is now being taught by schools whose states are members of the CASE consortium.

In recent years, due to globalization and the exponential advances in science and technology, the science community and educational institutions are recognizing the need for more and better science instruction in K-12 programs. In 2007, the National Academy of Sciences (NAS) acknowledged that the United States is losing its global leadership role in technology and science in the congressional report *Rising above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*. One of the four recommendations was to vastly improve K-12 science education. In their 2009 summit report The National Academies of Science (2009) suggested that we are now in an era of "scientific agriculture." The group also suggested that as the disciplines become so intertwined consideration should be given to adding agriculture to the STEM (science, technology, engineering and mathematics) disciplines to create the acronym STEAM. Furthermore they recommended that colleges and universities reach out to high schools and other youth programs to start building awareness in youth about these intertwined disciplines to recruit them into scientific agricultural disciplines.

As the trend to integrate science and agricultural education has evolved, so has research related to the integration of science into agricultural education. The American Association of Agricultural Education responded to this emerging trend by creating a special interest group called "Strengthening Academic Learning through Agricultural Education." In 2005, Myers and Osborne developed the *Conceptual Model for Strengthening Academic Learning through Agricultural Education* to guide this group in identifying existing gaps in the literature and to help provide a directional path for future research related to the integration of science and agricultural education. Their model was derived from a model for the study of classroom teaching created by Dunkin and Biddle in (1974). (See Figure 1.)

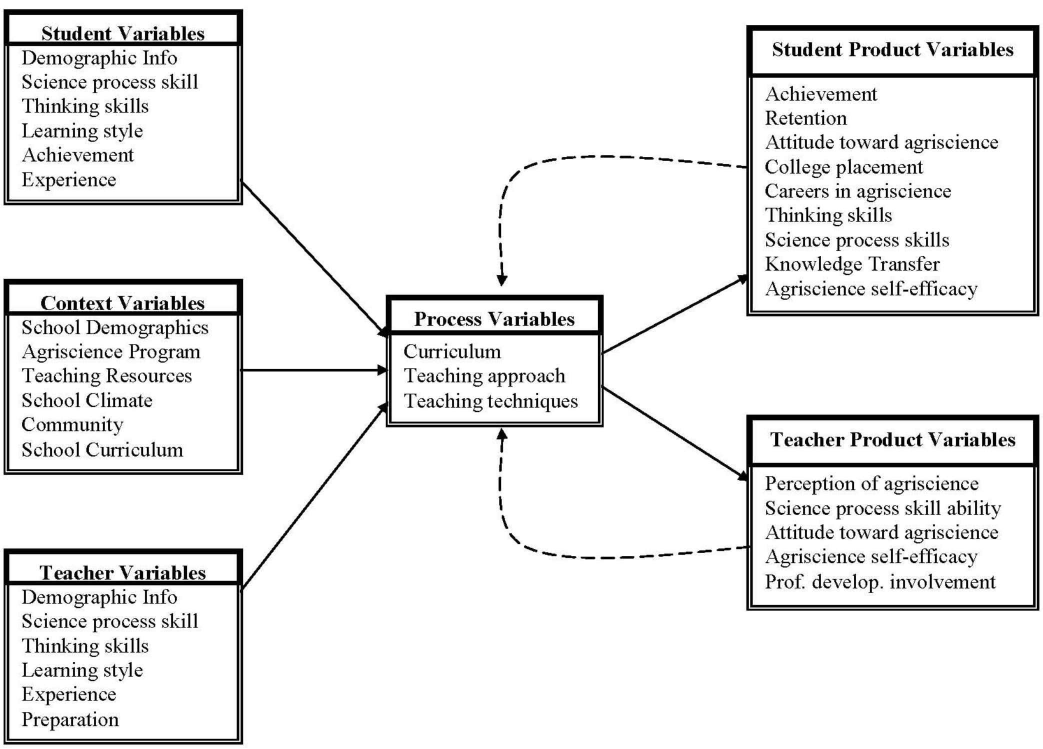

Figure 1. Myers, B. E. & Osborne, E. W. (2005). *Conceptual Model for Strengthening Academic Learning through Agricultural Education Research.* Department of Agricultural Education and Communication, University of Florida, Gainesville.

In Figure 1, the process variables are possible models for integrating science and agricultural education. In a report prepared for the US Department of Vocational Education, Stasz and Grubb (1991) stated that "Integration means different things to different people and reform efforts vary widely, from fairly simple course changes to efforts that effectively restructure the high school" (p.1). Many practitioners have developed models to integrate vocational and academic studies; however, the most common model of vocational and academic integration is the reinforcement model, which incorporates academic content into vocational courses (Roberson, 1997). This review of literature does not address the variations in models used to integrate science and secondary agricultural education. Instead our intention was to focus on the outcomes of efforts to integrate science and secondary agricultural education. As illustrated in Figure 1, these product variables are essential for revising existing processes.

Purpose/Objectives

The purpose of this study is to review the findings of research related to the integration of science and agricultural education in order to make conclusions regarding the outcomes of efforts to integrate science and secondary agricultural education and to identify gaps in the existing research.

The objectives of this study are to synthesize research related to the:

1. teacher product variables in the *Conceptual Model for Strengthening Academic Learning through Agricultural Education Research.*

2. student product variables in the *Conceptual Model for Strengthening Academic Learning through Agricultural Education Research.*

Procedures

Internet and library searches were used to acquire data for the study. Only works published within the last twenty years were included in the findings section. Reference sources that were searched included proceedings of regional and national AAAE research meetings, *The Journal of Agricultural Education, The Journal of Vocational Education Research*, and keyword searches on the ERIC database to locate sources in other research disciplines.

Findings

The findings presented in this study reflect the work that has been done on the product variables of teachers and students as demonstrated in the previously explained conceptual model for strengthening academic learning through secondary agricultural education. The research discussed does not necessarily represent an exhaustive list of the work completed on the topic of integrated curriculum in agricultural education.

Student Attitudes

When biology is taught using agriculture as the context, students have favorable perceptions of the agriculture industry (Balschweid, 2002), and understand biology concepts better in the contextualized approach than with other "traditional" biology courses (Balschweid, 2003). Conroy and Walker (2000) highlighted the perceptions of students enrolled in a secondary aquaculture curriculum. The researchers collected qualitative data and found students believed the aquaculture curriculum contextualized what they were learning in other academic classes such as math and chemistry. Due to the deficiency of studies related to this product variable, further and more current research is needed to ascertain students' feelings toward integrated processes.

Student Achievement

Chiasson and Burnett (2001) demonstrated that students enrolled in an agriscience curriculum outperformed non-agriscience students on the science component of the Louisiana graduate exit examination. More recently, Theriot and Kotrlik (2009) demonstrated that being enrolled in agriscience had a statistically significant, although not practically significant positive effect on overall science achievement when compared to non-agriscience students on the Louisiana graduate exit exam These findings are similar to a Georgia study which found a low positive correlation between the science achievement of agriscience students on a graduation test and the number of agriscience courses they had taken in high school (Ricketts, Duncan, & Peake, 2006). Flowers (2000) compared the achievement scores of agricultural education students to those in other vocational areas as well as college prep students. Results indicated substandard marks in reading and mathematics for agriculture students compared to other groups, but a substantial advantage in the area of life sciences.

Studies aimed at determining the achievement of students enrolled in integrated agriculture courses, show that agriculture students score similar or better on science concepts than those in traditional science settings. Connors and Elliot (1995) found no significant differences in achievement on a standardized biology subject test between students who had and had not enrolled in agriscience courses. Similarly, in a study that compared students enrolled in a traditional biology course to those taught with agricultural applications, Warrick and Straquadine (1998) found that the two groups performed equally on a Biology Core Test.

Roegge and Russell (1990) determined that an integrated approach to teaching biology was superior to a more traditional approach with regard to student achievement. Students who were taught with an integrated approach had significantly higher levels of achievement in applied biology concepts and overall. Enderlin and Osborne (1992) compared the achievement of students enrolled in an integrated agriculture and science course to those in a traditional horticulture course in Illinois. The researchers found that students in the integrated group performed better on measures of both agricultural and biological science knowledge.

Student Science Process Skills

In a qualitative study of elementary students, Mabie and Baker (1996) reported that integrated activities had a greater positive effect on science process skills when compared to alternative methods. Myers and Dyer (2006) examined the effect of laboratory delivery on the science process skill achievement of agriculture students. Although the treatment groups did not directly control for the level of integration present, the researchers found that an investigative laboratory approach yielded higher science process skill gain scores than traditional methods with lesser degrees of integration. The notion that an integrated approach is beneficial for the acquisition of science process skills is in direct conflict to an earlier study done by Osborne (2000) which concluded that students in a traditional prescriptive approach to laboratory had higher levels of science process skills than those in a more heavily integrated "investigative" approach.

Student Retention

A review of literature in the field of agricultural education research did not yield any studies that specifically addressed student retention in the context of academic integration. It is likely that such a study would have tremendous difficulty controlling for other variables. Broader work, however, can be applied to agricultural education and the concept of academic integration. Analyzing data from the National Educational Longitudinal Study of 1988, Plank (2001) asserted that career and technical education courses, such as agriculture education, "when coupled with an academic load may increase a student's commitment or attachment to high school" (p. 310). Plank further concludes that a balance of CTE and academic courses, rather than an extreme focus on either is likely the best formula for keeping students in school.

Teacher Perceptions & Attitudes

A considerable number of the studies conducted on the topic of academic and agricultural education curriculum integration relate to the perceptions of educators. Agriculture teachers are favorable to the idea of integrating academics into the agriculture classroom (Thompson & Balschweid, 2000; Wilson, Kirby, & Flowers, 2001; Myers & Washburn, 2007; Thompson, 1998; Balschweid & Thompson, 2002; Roberson, Flowers, & Moore, 2001). Science teachers are also in favor of integration, and recognize the benefit that real world context agriculture can provide (Warnick, Thompson, & Gummer 2004; Osborne & Dyer, 1998; Warnick & Thompson 2007). Other key players in education who are "on-board" with integration include principals (Thompson, 2001), and guidance counselors (Dyer & Osborne, 1999; Woodward & Herren, 1995).

With the increased focus on academic content in a vocational classroom, comes increased rigor and expectations. This has led many to demand science credit for agriculture courses. In fact, teachers overwhelmingly support granting science credit for the completion of integrated agriculture courses (Johnson, 1996).

Despite the positive attitudes toward integration, integrated curricula has not achieved widespread implementation. Myers and Thompson (2009) highlight the need for a philosophical shift in the profession in order to "buy-in" to the idea on integrating math, science, and reading. This implies that although teachers may recognize integration as important, they need encouragement and assistance to adopt integrated curriculum in their classrooms.

Agriscience Self-efficacy

To aid in discovering why integrated practices are not necessarily commonplace in today's agricultural education classroom, researchers have probed teachers on their self-efficacy. Scales, Terry, and Torres (2009) analyzed the confidence and competence of agriculture teachers in Missouri and found that although agriculture teachers were confident they could integrate science content, their low scores on a subject test in science demonstrate that they may not be proficient to do so. This failure to demonstrate competence in science through a subject test was also demonstrated by Wilson, Kirby, and Flowers (2001). However, in that case the agriculture teachers accurately perceived their lack of knowledge.

Several studies have identified barriers that prevent greater adoption of integrated curriculum. Layfield, Minor, and Waldvogel (2001) identified a lack of equipment, funding, and in-service/teacher education training as critical barriers. Washburn and Myers (2008) found that agriculture teachers think more can be done to prepare future teachers to integrate science, while a study of West Virginia agriculture teachers (Boone, Gartin, Boone, & Hughes 2006) cited a lack of background knowledge as a barrier for integrating curriculum. Balschweid, Thompson, and Cole (2000) reported that pre-service teachers were actually *less* likely to integrate curriculum after having been exposed to integration in a student teaching role. Reasons the preservice teachers had for the decline in their perceived importance of integration pointed toward the amount of time involved in integrating material. Clearly, these studies demonstrate that more can be done in our teacher preparation programs and in-service training to prepare agriculture teachers to integrate academics into their curriculum.

Resource Sharing/Collaboration

The ability of the agriculture teacher to cooperate with other academic teachers is key for successful team teaching or other collaborative exercises. Dormody (1993) developed a predictive model for resource sharing and collaboration between the agriculture teacher and the science department. The model emphasizes a positive view of science on behalf of the agriculture teacher and positive interpersonal relationships between collaborators. Conroy and Walker (2000) reported that agriculture teachers cite territorial issues as barriers for increased attempts at integration, highlighting Dormody's (1993) need for positive interpersonal relationships with science department personnel.

In a study comprised of agriculture and science teachers, Stephenson, Warnick, and Tarpley (2007) identify that both groups of educators recognize insufficient preparation time as most inhibitory to collaboration. Myers and Washburn's (2007) study echoes the issues of a lack of planning time, and equipment reported in other studies, but also cites insufficient funding as a barrier to integration.

Professional Development Involvement

Several researchers (Boone, Gartin, Boone, & Hughes 2006; Balschweid, Thompson, & Cole 2000; Scales, Terry, & Torres, 2009), in the context of evaluating the status of integrated curriculum in agricultural education, have called for increased support from teacher education and in-service opportunities to prepare teachers to integrate. Layfield, Minor, and Waldvogel (2001) reported that teachers view both pre-service teacher education and in-service opportunities as the vehicles for the needed additional training. Wilson and Flowers (2002) researched the effect of a seven day agriscience in-service training program on the confidence of agriculture teachers' ability to integrate scientific subject matter. The researchers found that those who participated in the in-service had significant gains in their pre and post training confidence when compared to a control.

Despite the apparent lack of "content" training, researchers (Myers, Washburn, & Dyer, 2004; Hamilton & Swortzel, 2007) assert that agriculture teachers possess the proper knowledge to perform and apply science integrated process skills. That is to say, agriculture teachers are equipped to teach in ways that science educators find most beneficial such as the inquiry approach. When coupled with the work done on the science process skills of students in agriculture education (Mabie & Baker, 1996; Myers & Dyer, 2006), it appears agriculture is ripe for adopting science process skills as a means to integrate the two disciplines.

Conclusions/Recommendations

The National Research Agenda: 2007-2010 (Osborne, et al., nd), identified the need to provide a "rigorous, relevant, standards based curriculum in agricultural, food, and natural resources systems" (p.8) making curriculum development trends a research priority. As a result of this agenda the "Strengthening Academic Learning through Agricultural Education" American Association of Agricultural Education special interest group developed a conceptual model which identified teacher and student product variables. This synthesis of research focused exclusively on research regarding the teacher and product variables in this conceptual model. After a review of the findings, it becomes clear the profession needs to increase focus on more empirical research designs as opposed to the perception based descriptive studies that dominate the literature on this topic. Nonetheless, the conclusions of this study are based on the body of research that does exist.

Research on student attitudes regarding integrated agriscience is limited. Those studies identified concluded that students who have experienced an integrated process variable such as integrated curriculum possessed a more positive attitude about the integration of science and agricultural education. More attention should be given to examining these student attitudes which can affect student motivation, recruitment, and retention in agricultural education.

A somewhat positive relationship exists between student achievement and integrated agriscience processes. Most of the studies found compared test scores of students at the end of a process or course. In the future, new statistical software may be able to determine the influence of a particular teacher or course on student academic achievement using three years of end of course data (Wallis, 2008). More experimental studies rather than descriptive studies are needed to conclude that integrated science processes do affect student achievement in the sciences. In addition several of these studies were done in the early 1990s and current integrated processes need to be examined.

There is currently a deficit in research regarding the effects of integrated agriscience processes on student retention, college placement, careers in agriscience and knowledge transfer. This deficiency is not uncommon in educational research because such studies are longitudinal in nature and challenging to complete. Although the research regarding students' acquisition of science process skills through integrated curriculum is somewhat mixed, it seems agriculture teachers are capable of applying inquiry based approaches to the agriculture curriculum. More research is needed however, to better gauge the perceptions and confidence of agriculture teachers with regard to the implementation of science process skills.

Agricultural teachers, science teachers, principals, and guidance counselors generally value integrated agriscience processes. While teachers value integrated curriculum and overwhelmingly support receiving science credit for their courses, integration still has not been widely implemented.

A few studies have found agricultural teachers possess the self-efficacy needed in order to adopt integrated agriscience processes; however, teachers recognize they lack the necessary knowledge. According to Weiner's attribution theory (Weiner, 1985) even though they possess self-efficacy, they will not carry the action out if they perceive an uncontrollable barrier exists. Unfortunately, teachers perceive many barriers to integrated agriscience processes such as a lack of equipment, funding, resource sharing, and time. Many researchers concluded that pre-service and in-service programs should address these barriers and processes should be designed that reduce the intensity of the barrier. Professional development efforts have been made by state and national agencies such as the National Agricultural Education Council; however, little research exists regarding the outcomes of these professional development efforts.

This synthesis of research identified several areas of deficiencies pertaining to the integrated product variables (outcomes) of science integration in agricultural education. The following questions should be addressed by the agricultural education profession:

1. What integrated agriscience process variables are currently being used to integrate science and agricultural education?

2. What current integrated agriscience process variables are most effective in producing student and teacher product variables?

3. What long term effect do science and agricultural education processes have on student outcomes such as college placement, selection of a career in agriscience, and knowledge transfer?

4. Do agriscience integration processes increase a student's self-efficacy in agriculture and science?

5. Do agricultural education teachers possess the science content knowledge needed to implement integrated process variables?

6. What types of pre-service and in-service activities are most effective in getting teachers to implement integrated agriscience process variables?

7. Do teachers perceive there are different barriers to implementing different types of integrated process variables?

8. What determines teachers' attitudes toward implementing integrated agriscience?

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An analysis of national agriscience teacher ambassadors' stages of concern regarding inquiry-based instruction

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Abstract

As teachers are held more and more accountable for the achievement of their students, agriscience teachers must focus on effectively integrating scientific core concepts into agriculture classes. Inquiry-based instruction is currently considered a best practice in increasing students' science content understanding, but is often avoided by teachers who are hesitant about utilizing this form of instruction. The National Agriscience Teacher Ambassador Academy (NATAA) is a professional development opportunity offered to agriscience teachers in an effort to increase their skill at and willingness to incorporate inquiry-based instruction into their classrooms. This study investigates the stages of concern of the 71 NATAA participants through the use of the Stages of Concern Questionnaire in an effort to determine the utilization of NATAA as an effective means of training agriscience teachers to use inquiry-based instruction. Participant responses indicate that NATAA's training reduces low-level concerns for those who participated for two years instead of one, as well as for teachers who attended the training after its reformatting in 2007. Lastly, results suggest that participants with more than six years of teaching experience are more consistent in their concerns than less experienced teachers.

Introduction

Many educators believe that curriculum integration through inquiry-based instruction is a logical format for effectively teaching today's students due to its similarity to natural human processes. While many high school core content areas are unfamiliar with the practice of curriculum integration, agricultural education has historically included a well-rounded curriculum that teaches the basics of various other subjects through agriculture rules, procedures, and concepts (Shinn et al., 2003). In agriscience classes, biology and science content can be incorporated seamlessly into agricultural principles, provided the teachers are willing and able to do so. Further, the National Science Education Standards promote inquiry-based instruction as a main method to effectively teach science (Keys & Bryan, 2001). However, while the idea of integrating various areas of curricula into different classes through the use of inquiry-based instruction seems like a fluid method of learning, teaching in this fashion proves to be more difficult, and is often associated with many barriers, including successful teacher training (Enderlin & Osborne, 1992). Addressing this need through professional development is thought to be an effective method of disseminating information on the process and practice of inquiry-based instruction to enhance curriculum integration. Although arriving in various forms of workshops, sessions, collaborations, observations, and meetings, professional development in general is considered a keystone in implementing change (Guskey, 1994).
Researchers have identified the need for additional investigation related to the implementation of inquiry-based instruction in the areas of teacher beliefs about inquiry, teacher knowledge base for implementing inquiry, and teacher inquiry practices (Keys & Bryan, 2001). By conducting a

study to determine the stage of concern teachers in the National Agriscience Teacher Ambassador Academy (NATAA) feel regarding their competence in utilizing inquiry-based instruction, we can identify key factors as identified in previous research that affect the program's success as a training tool and add to the available literature on the implementation of inquiry-based instruction. Further, we can determine the degree to which this particular method of professional development prepares teachers to utilize inquiry-based instruction in the integration of science curriculum into agriculture classes. If this method is found to be successful, it could be replicated for professional development on other topics.

While the philosophy of curriculum integration is not universally accepted, it has received a great deal of attention in many educational settings (Innovative Teaching Concepts, 1996). Advocates take pride in the philosophy's ability to address curricula in a way that develops student abilities required by everyday life (Innovative Teaching Concepts, 1996). Claimed benefits of curriculum integration include:

1. students seeing relationships among ideas and concepts as they plan;
2. relationships between in- and out-of-school topics becoming obvious to students;
3. the encouragement of students to share ideas;
4. the expansion of peer respect and cooperation through interaction;
5. students becoming responsible for, and engaging in, their own learning; and
6. the development of a sense of community by cooperative student activities (Innovative Teaching Concepts, 1996).

Benefits of curriculum integration in the agriculture classroom can greatly impact high school students. T. Bailey, in *Integral Vocational and Academic Education* states:

> agriculturally based activities, such as 4-H and FFA, have for many years used the farm setting and students' interests in farming to teach a variety of skills. It only takes a little imagination to think of how to use the social, economic, and scientific bases of agriculture to motivate and illustrate skills and knowledge from all of the academic disciplines (1998, p. 27).

These implications impacted federal legislation; the Carl D. Perkins Career and Technical Education Improvement Act of 2006 states specifically the need for Agricultural Education programs to integrate core academic content into their classes (Heuvel, 2008). Washburn and Myers (2008) reported that some level of science integration was present in 217 Florida high school agriculture classrooms, and efforts to integrate were due to state standards, administrative expectations, the changing nature of the agriculture industry, science credit for agriculture courses, the notion that agriculture classes should be taught via science integration, and the notion that integration increases student learning, enrollment and enjoyment. Six studies cited in research by Myers and Thompson (2009), supported findings that higher student achievement resulted from the integration of scientific principles into agriculture classes.

Currently, there are a number of approaches to attempt the implementation of a successful integration program. Among these, project-based learning (involving inquiry-based instruction) is a popular example (National School-to-Work Office, 1997). Project-based learning is more student-centered than the traditional classroom, requiring collaboration of teachers and students to develop projects focused on specific occupational issues. For example, a class focusing on occupational safety would develop their own projects and experiments to discover their own answers to questions they have about occupational safety. Teaching science through an inquiry-oriented approach is strongly recommended by both the National Science Education Standards (National Research Council [NRC], 1996) and the Benchmarks for Science Literacy (American Association for the Advancement of Science, 1993).

Both the National Science Education Standards (NRC, 1996) and research conducted by Keys and Bryan (2001) maintain that inquiry-based instruction is not a specific teaching method or curriculum model, but rather a guiding principle on how instruction is delivered. While the National Science Education Standards do not provide specific methods for conducting inquiry-based instruction, they do suggest that learning through scientific inquiry allows students to develop abilities necessary to conduct scientific inquiry, as well as an understanding of scientific inquiry (NRC, 1996). Chiappetta and Adams (2004) also identified several objectives of inquiry-based instruction in the science classroom, including the development of the disposition to ask and answer questions about the natural world and a positive attitude about science, in addition to the two aforementioned objectives identified by the National Science Education Standards (Gengarelly & Abrams, 2008).

Several research endeavors have identified multiple barriers to incorporating inquiry-based instruction in science, and teacher beliefs regarding science, students, and teaching is a common thread between these identified barriers (Keys & Bryan, 2001). Regardless of the general view that inquiry-based instruction can positively impact student learning, Deters (2004) and Windschitl (2004) have observed that teachers oftentimes resist implementation because of their expectancy of undesired consequences. Gengarelly and Abrams (2008) specify some of these undesired consequences as loss of classroom control and safety mishaps. Other teacher concerns include the possibility of longer time requirements, increases in student misconceptions, and subjective grading. Keys and Bryan (2001) also identified teacher perceptions of the rigidity of the scientific method as a barrier to inquiry-based instruction, possibly influenced by a teacher's own lack of inquiry-based exploration (Windschitl, 2004). One of the key sources for these barriers is teacher experience, and these are magnified in less experienced teachers (Crawford, 1999). Teachers relatively new to the profession can lack key knowledge in the areas of pedagogy, content, students, and classroom management, all of which can hinder inquiry-based instruction as a useful teaching tool.

Despite the indication of agriculture teachers' willingness to integrate science curriculum into their classrooms, the previously mentioned barriers hinder the degree to which science integration through inquiry-based instruction is utilized. These barriers collectively seem insurmountable to overcome when implementing inquiry-based instruction; however, they can all be addressed through effective training. Because teacher beliefs influence knowledge focused on, tasks assigned, course content taught, and assessments used, training teachers effectively is imperative when reforming education (Keys & Bryan, 2001). Eick, Meadows, and Balkcom (2005), Windschitl (2004), and Gengarelly and Abrams (2008) have all stated that the successful implementation of inquiry-based instruction in a classroom can be improved through support provided for the teacher. This notion that training can improve teaching methods is not unconventional; the majority of efforts to reform schools utilize professional development as a means to implement change (Guskey, 1994).

In an effort to better prepare agriscience teachers to utilize inquiry-based instructional methods when incorporating science curriculum into agriculture classes, the National FFA Organization, partnering with DuPont and LabAids, developed the National Agriscience Teacher Ambassador Academy (NATAA) for agriculture teachers. Between 2002 and 2006, the NATAA focused primarily on offering science curricula training to agriculture teachers through the utilization of Lab Aids, as well as showing the importance of promoting careers in science (L. Gossen, personal communication, October 12, 2009). In 2007, the NATAA added a strong focus in inquiry-based instruction to its training, under the idea that classrooms that utilize inquiry-based instruction can potentially improve student understanding of science curricula (Keys & Bryan, 2001). Currently, the NATAA is an intensive week-long professional development opportunity that immerses participants in inquiry-based teaching techniques. The high-intensity format has shown to increase active teacher participation and learning (Garet, Porter, Desimone, Birman, & Yoon, 2001). Sessions are led by nationally recognized experts in inquiry-based teaching techniques and teacher professional development design and delivery. Upon completion of the training, teachers are then referred to as Ambassadors for Agriscience (National FFA Organization, 2009). These ambassadors provide workshops within their states and regions, and lead professional development at the Agriscience Institute, provided for agriculture teachers at National FFA Convention, and the National Association of Agriculture Educators Conference, both held annually. Teachers are permitted to participate in the training for a maximum of two years. Allowing teachers to participate in the training for two years coincides with research that identifies duration as a significant factor in increasing teacher depth of change (Garet, et al., 2001). Additionally, Supovitz and Turner (2000) posit the quantity of training in which teachers participate is strongly linked to inquiry-based teaching practices. The NATAA maintains six objectives:

1. Increase interest in agriscience based educational activities in Agricultural Education programs through the training of, and workshop presentations by, ambassadors.
2. Identify and select agriscience teachers who have a passion for agriscience education, that are effective presenters, that engage students in science based activities, and understand the total program concept for participation in the program.
3. Allow the ambassadors the opportunity to interact with scientists and other personnel from DuPont to more clearly understand career opportunities in all fields of science and to introduce DuPont staff to the NATAA program.
4. Provide interactive classrooms for teacher instruction at the National FFA Convention Career Show and the NAAE National Convention Expo
5. Provide teachers with educational resources, training and information on ways to implement science-based activities in their agriculture classrooms.
6. Share lesson plans, laboratory exercises and teaching strategies among ambassadors in order to improve the resources available for teaching agriscience.

In order to determine how successful a professional development session is in bringing about desired change, a number of factors can be considered. One of these is teacher concern regarding the innovation, which has been assessed in past research through the Stages of Concern Questionnaire (SoCQ). The SoCQ has been used repeatedly in order to examine teacher concerns across academic settings. In 2004, Christou, Eliophotou-Menon, and Philippou utilized the SoCQ in Cypress to assess the concerns of 655 primary school teachers across 100 schools to determine the success of a mathematics curriculum integration. In this study, researchers found the assessment of teacher concerns to be essential to successful implementation. In 1997, Gwele utilized the SoCQ to assess staff concerns during the implementation of a problem-based learning program in a nursing school. This study supports the use of concerns data to plan staff development.

The SoCQ measures stages of concern regarding an innovation (Hall & Hord, 2006). These stages derive from Francis Fuller's Concerns-Based Adoption Model, which identify the stages of concern as a developmental pathway through which teachers proceed as they implement a change (George, Hall, & Steigelbauer, 2006). The seven stages, shown in Figure 1 (Hall & Hord, 2006), were originally identified through various research endeavors conducted by the staff members of the Research and Development Center for Teacher Education of the University of Texas at Austin in 1969. Innovation users can move through these stages according to their developmental familiarity with the innovation. While this developmental pattern is not a certainty, it remains fairly consistent (George, Hall, & Steigelbauer, 2006).

Stage	Title	Description
6	Refocusing	The individual focuses on exploring ways to reap more universal benefits from the innovation, including the possibility of making major changes to it or replacing it with a more powerful alternative.
5	Collaboration	The individual focuses on coordinating and cooperating with others regarding the use of the innovation.
4	Consequences	The individual focuses on the innovation's impact on students in his or her immediate sphere of influence.
3	Management	The individual focuses on the processes and tasks of using the innovation and the best use of information and resources.
2	Personal	The individual is uncertain about the demands of the innovations, his/her adequacy to meet those demands, and/or his/her role with the innovation.
1	Informational	The individual indicates a general awareness of the innovation and interest in learning more details about it. The individual does not seem worried about him or herself in relation to the innovation.
0	Unconcerned	The individual indicates little concern about or involvement with the innovation.

Figure 1: Seven Stages of Concern

A study regarding the stage of concern participants of the NATAA feel regarding inquiry-based instruction can determine the efficacy of the academy in training agriscience teachers to effectively incorporate inquiry-based instruction into their classrooms. Further, factors including teaching experience, duration of participation in NATAA, and implementation of specific inquiry-based instruction training into the academy can be examined to determine their effect on the program's success. Information gained by investigating this professional development model can be utilized in the development and delivery of professional development for other topics in the profession.

Purpose

Evaluation of this professional development program and key factors identified in previous research that may affect its success can help determine its merit as an effective training tool for agricultural education teachers. The purpose of this study is to determine the stages of concern participants of the NATAA feel toward inquiry-based instruction, and whether their comfort level is affected by the level of involvement they have had in NATAA training.

Objectives

To accomplish the aforementioned purpose, this study has 3 objectives:

1. To determine differences in stages of concern percentiles regarding inquiry-based instruction of participants in the NATAA grouped by number of times they participated in the academy.
2. To determine differences in stages of concern percentiles regarding inquiry-based instruction of participants in the NATAA grouped by NATAA format they attended (before or after its alteration in 2007).
3. To determine differences in stages of concern percentiles regarding inquiry-based instruction of participants in the NATAA grouped by length of teaching experience.

Methods

Participants

To complete the objectives, an email including a survey invitation for The Stages of Concern Questionnaire, designed by George, Hall, and Steigelbauer (2006) was sent to the population of NATAA participants (N=71). According to Dillman, Smyth and Christian (2009), the most effective method of increasing participation rate on internet surveys is multiple contacts. Because little research has been performed regarding the optimal combination of contacts, the number of contacts after the initial invitation is left up to the researcher. However, it is recommended that when response rate per reminder email stalls, the researcher ceases sending reminders. In this study, the original survey invitation resulted in a participation rate of 39% (n=28). Three reminders were sent at one week intervals with respective participation rates of 26% (n=11), 19% (n=6), and 46% (n=12). Overall participation rate was 80% (n=57).

Instrument

To address the objectives, an electronic version of The Stages of Concern Questionnaire, designed by George, Hall, and Steigelbauer (2006) was used. The questionnaire consists of 35 Likert-type questions that assess the respondent's level of concern regarding inquiry-based instruction. An answer of 0 indicates no relevant concern is present, 1 indicates the concern is not true of the respondent now, progressing to 7, which indicates the concern is very true of the respondent now (Bailey & Palsha, 1992). Additionally, ten demographics questions were added to the questionnaire in order to determine possible relationships between stages of concern and demographic variables. An open-ended question inviting respondent comments on their views of implementing inquiry based instruction was also included, as is recommended by Hall and Hord (2006).

The Stages of Concern Questionnaire was chosen because of its long history of continuous improvement, as well as its high levels of established reliability (Warner, 2009). George, Hall, and Steigelbauer (2006) stated that validity has been tested through calculating the relationships among stages, as well as between stages and variables identified in other concerns theories. In the original validation studies of the SoCQ, "analysis led project members to infer that the seven scales tapped seven independent constructs that could be identified readily with the seven Stages of Concern proposed in the concerns-Based Adoption Model" (George, Hall, & Steigelbauer, 2006, p.14) . Validation of the instrument is provided in its high item correlation with the stage to which the item was assigned (Bailey & Palsha, 1992). Bailey and Palsha (1992) indicated that seventy-two percent of the items correlated more highly with the stage to which they had been assigned than with any other stage. This study also supports the proposed order of the scale, indicating a decreasing correlation between subscales as the distance between them increases. Further, several validation studies stated in George, Hall, and Steigelbauer (2006) indicate that resulting scores followed the Stages of Concern model based on their level of training in the innovation. Coefficients of internal reliability stated in George, Hall, and Steigelbauer (2006) are depicted in Table 1 below.

Table 1.
SoCQ Coefficients of Internal Reliability (George, Hall, & Steigelbauer, 2006)

Stage	0	1	2	3	4	5	6
Alpha	.64	.78	.83	.75	.76	.82	.71

Santos (1999) stated that an alpha score above .7 is acceptable, and each stage of concern, with the exception of Stage 0, meets this criterion. As shown in Table 2, the test-retest correlations reported by George, Hall, and Steigelbauer also fall into this category, again with the exception of Stage 0. Stage 0 is currently under revision to improve its reliability (George, Hall, & Steigelbauer, 2006). Cronbach's alpha was calculated *post hoc* for the overall use of the SoCQ and was found to be .90. Following the guidelines set forth by Santos (1999), this was deemed acceptable.

Table 2.
SoCQ Test-Retest Correlations (George, Hall, & Steigelbauer, 2006)

Stage	0	1	2	3	4	5	6
Alpha	.65	.86	.82	.81	.76	.84	.71

Data Analysis

Upon completion of data collection, responses were analyzed using the calculations recommended by George, Hall, and Steigelbauer (2006) and developed in Excel format by Scott and Persichette (2006). Raw scores in each stage of concern were averaged and analyzed by different groupings according to variables identified in the objectives. In order to perform accurate analysis, average raw scores in each stage of concern were converted into percentile scores. The 2006 Stages of Concern Questionnaire publication by George, Hall, and Steigelbauer, as well as the Excel program, provides the raw score-percentile conversion chart.

This percentile chart was utilized throughout the previously mentioned validation studies, and has proved to be representative of various innovations (George, Hall, & Steigelbauer). When analyzing percentile scores, the higher the score, the more intense the concerns are at that stage. Because percentile scores in each stage of concern are dependent on one another, analysis through a concerns profile, which maps out an individual's or group's concerns, is the most interpretive and most frequently used method for analyzing SoCQ data (George, Hall, & Steigelbauer).

Results

Demographics

Out of the 57 respondents, 17.5% have between one and five years teaching experience (n=10), 33.3% have been teaching for between six and ten years (n=19), and 40.1% have been teaching for over 10 years (n=23). Over half (59.6%) of the respondents attended the NATAA training for one year (n=34), while 40.4% attended the training for two years (n=23). Regarding attendance before or after the alteration of the NATAA in 2007, 40.4% of the respondents participated in NATAA training before 2007 (n=23), while the remaining 59.6% participated after the training's alteration.

Number of Years Participated

Figure 2 below compares the compiled percentiles in each stage of concern for respondents who participated in the NATAA training for one year with those who participated for two years. Respondents who attended one year of NATAA training had most intense percentile scores in Stage 0, which indicates that there are a number of initiatives, tasks, and activities that are of concern to this group of people. Their lowest score in Stage 4 suggests that this group has minimal concern about the effects of inquiry-based instruction on students. While the respondents who attended two years of NATAA training share this low level of Stage 4 concern, this group's highest percentile in Stage 5 suggests concerns about working with others in relation to use of inquiry-based instruction. These two groups share similar profile patterns, except with regard to Stage 0, indicating that the group with two years of training is less concerned with other innovations than those with one year of training. The profiles for both groups display a tailing-down effect at Stage 6 (Refocusing), which indicates group willingness to change; respondents do not have ideas that would potentially compete with the implementation of inquiry-based instruction (George, Hall, & Steigelbauer, 2006).

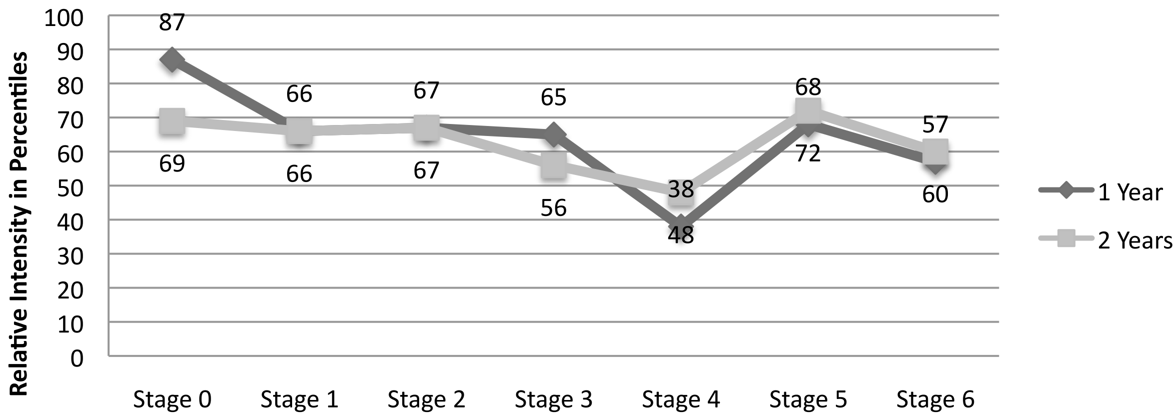

Figure 2. SoC Profile of NATAA Participants According to Number of Years Participated

NATAA Format

In order to determine any difference in the effect of incorporating inquiry-based instruction training into the NATAA on participant stage of concern, results were grouped according to the year each respondent participated in the training in Figure 3. The following concerns profile compares overall percentile scores in each stage of concern between respondents participating in NATAA training between 2002 and 2006 and those participating in NATAA training between 2007 and 2009.

Both profiles display highest percentile scores in Stage 0, which indicates that there are a number of initiatives, tasks, and activities that are of concern to the groups. This stage does not indicate the degree to which individuals in each group are using inquiry-based instruction. The next highest percentile score for 2002-2006 participants is in Stage 1, which indicates that these individuals would like more fundamental information about inquiry-based instruction. The second highest percentile for 2007-2009 participants is in Stage 5, which indicates individuals are focused on coordinating and cooperating with others regarding use of inquiry-based instruction. This difference in second highest stage scores indicates that most individuals participating in NATAA training after its reconstruction in 2007 are more concerned with collaboration in inquiry-based instruction and less about general information regarding inquiry-based instruction than 2002-2006 participants. Again, both group profiles tail down at Stage 6. This indicates willingness to change, regardless of which NATAA training format participants attended. Lastly, the difference between 2002-2006 participant first and second percentiles is 19 points, indicating a great distinction between intensity of concern at these stages, while the respective difference in 2007-2009 participant scores is three points, indicating they are almost equally concerned with collaboration of inquiry-based instruction as they are with other initiatives.

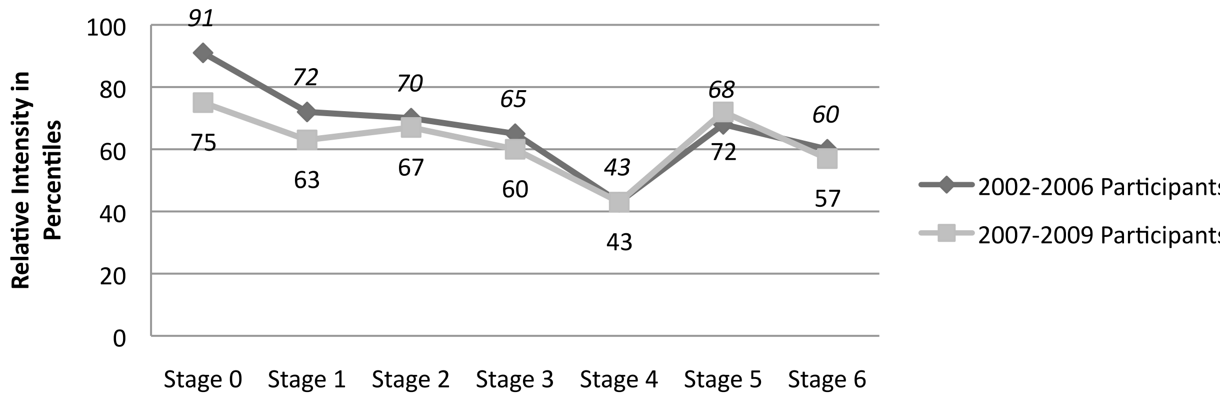

Figure 3. SoC Profile of NATAA Participants According to Date of Participation

Years of Teaching Experience

Figure 4 below displays differences in percentile scores in each stage of concern between respondents with teaching experience between one and five years, those with teaching experience between 6 and 10 years, and those with over 10 years teaching experience.

Each group's percentile profile follows a similar pattern. Stage 0 percentiles are highest for all three groups, indicating that all groups feel that there are a number of initiatives, tasks, and activities that are of concern. The tailing-down at Stage 6 for each of these groups, like in the previous results, indicates that respondents in each group display willingness to change.
Top three highest stages of concern are Stages 0, 2, and 1 respectively for both groups with teaching experience over five years. This indicates that these two groups hold similar concerns regarding inquiry-based instruction. However, the difference between the first and second highest percentiles of participants with over ten years teaching experience is greater than the respective difference of percentiles of participants with six to ten years experience, indicating that teachers with greater than ten years teaching experience have greater distinction between their concerns with other tasks and initiatives and their concerns with personal and informational aspects of implementing inquiry-based instruction.

The profile of participants with between one and five years teaching experience shows more variation than those of the other groups, suggesting that the intensity of different stages of concern varies more among individuals. Additionally, this group's second highest percentile is in Stage 5, indicating they have intense concerns regarding the coordination and cooperation of others when implementing inquiry-based instruction. Lastly, the *negative one-two split* shown between Stages 1 and 2 suggests that this group of teachers may have doubts and potential resistance to an innovation. This *split* indicates that concerns about the effect of inquiry-based instruction on job security may be greater than the desire to learn more about its implementation.

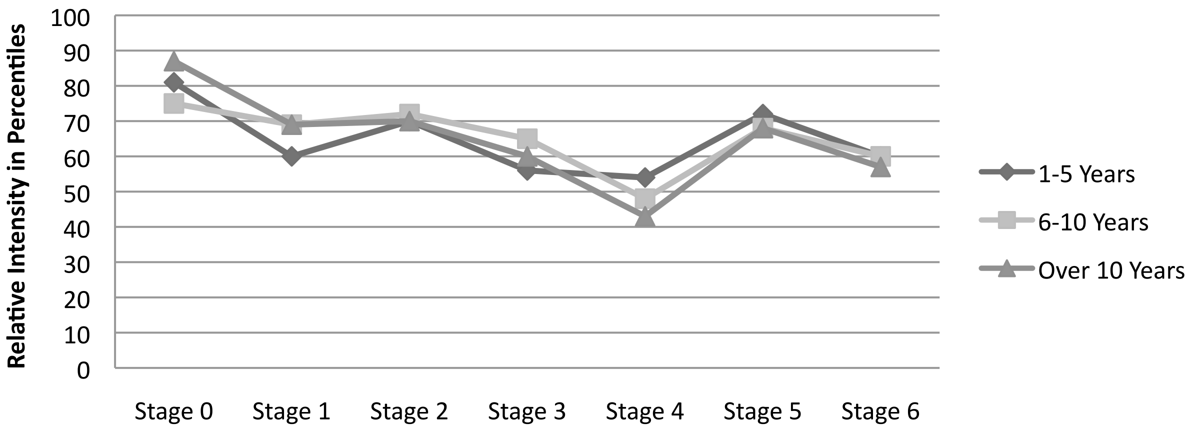

Figure 4. SoC Profile of NATAA Participants According to Length of Teaching Experience

Conclusions

Individuals who participated in two years of NATAA training were most concerned with issues related to collaboration, while individuals who participated in one year of training were most concerned with issues pertaining to a variety of tasks and innovations. Individuals usually move through the five developmental stages in the SoC model and user concerns move toward higher-level stages with time, successful experience, and the obtaining of new knowledge and skills (George, Hall, & Steigelbauer, 2006). Because the NATAA is designed to provide agriscience teachers with new knowledge and skills in inquiry-based instruction, as well as opportunities to develop their skills, it can be suggested that an increase in NATAA participation from one to two years resolves low-level, self-related concerns regarding inquiry-based instruction. Similarly, an increase in NATAA training also increases the ability of agriscience teachers to focus on higher-level, impact-related concerns that typically appear only after lower-level concerns have been resolved. This conclusion supports previous research that identifies the quantity of training as a factor affecting beliefs about inquiry-based teaching practices (Supovitz & Turner, 2000).

With regard to groups participating in NATAA training before or after its alteration to include development of inquiry-based instruction methods, both groups have intense concerns related to a number of task initiatives. However, differences between the first and second highest percentiles of the group participating before and after the academy's alteration in 2007 are 19 and three respectively, suggesting that the academy version that includes specific training on inquiry-based instruction serves to alleviate the low-level, self-related concerns of some individuals and allow more individuals to identify concerns at a greater variety of levels. Stages showing second highest percentiles for each group (Stage 1 for those participating in the training before its alteration compared to the second-most intense Stage 5 concerns of those participating in the training after its alteration) further confirm this conclusion that the current NATAA training serves to resolve low-level concerns and increase the ability of agriscience teachers to focus on emerging higher-level concerns regarding inquiry-based instruction.

Profile variations according to length of teaching experience indicate differences between teachers with less than six years experience and those with greater than five years experience. Teachers with between one and five years experience display greater variety in their intensity of stages of concern, suggesting that their concerns are less uniform and therefore may require more time, experience, or training to address all concerns which is congruent with research suggesting newer teachers need to gain more experience before being able to successfully utilizing inquiry-based instruction (Crawford, 1999). Additionally, this group displays a *negative one-two split* between Stages 1 and 2, which indicates that these individuals are concerned about how the implementation of inquiry-based instruction may affect their job security. Past research states that no relationships between years of teaching experience and stages of concern have been discovered (George, Hall, & Steigelbauer, 2006). However, this research suggests that while length of teaching experience may not have a direct affect on the efficacy of NATAA training, associated variables, such as tenure, current economic climate, and job security may cause some influence on the concerns of teachers with less than six years experience regarding implementing a new innovation, and may therefore cause an indirect effect on the efficacy of NATAA training.

Recommendations

The NATAA is a collaborative effort between various entities, including the National FFA Organization, DuPont, and LabAids. Due to the value of the time and resources of all parties involved, efforts should be made to maximize the academy's utility and efficacy. Results of this study conclude that the NATAA may have a positive effect on the concerns of agriscience teachers regarding inquiry-based instruction. NATAA participation appears to resolve low-level, self-related concerns and allow teachers to focus on higher-level, impact-related concerns that usually emerge after lower-level concerns are alleviated. The increased focus on enhancing skills to utilize inquiry-based instruction seems to heighten this effect, as does increasing length of participation in the training from one to two years. Therefore, the NATAA should investigate the possibility of offering increased opportunities for teachers to participate more than two times, hopefully enhancing this increased understanding of inquiry-based instruction further. Additionally, NATAA instructors should continue to focus on inquiry-based instruction training, as well as consider methods to improve the depth of knowledge and skill offered in this area. Lastly, inconsistency of concerns of teachers with less than six years teaching experience suggest that current NATAA training methods may not be as effective with this group as they are with more experienced teachers, whose concerns are more predictable and consistent. Therefore, it is recommended that the NATAA contributors maximize their efforts by focusing on training teachers with at least five years teaching experience. Through this narrowing of participant criteria, the NATAA can focus more on concerns that affect a large number of participants who are more likely to implement inquiry-based instruction.

Professional development can be costly for many parties due to constraints in funding, time, and resources. This study serves to further solidify the NATAA as an effective, valuable method of training teachers to utilize a current best practice in teaching science through agriculture. Subsequent research on the various effects and practices of NATAA, including efficacy of participants leading teacher training, can add opportunity for the academy to improve methods and practices in training teachers to incorporate science in their classrooms through inquiry-based instruction. Findings from further study can also be utilized to identify factors of the NATAA that increase teacher understanding and change. These factors can then be implemented in various training opportunities, both being offered through the NATAA and other training vehicles, to increase teacher depth of change and understanding in many development areas.

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Impacts of American agricultural education student teachers on Eleven Community Members in A New South Wales, Australia Community: A Qualitative Study

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Abstract

The purpose of this study was to evaluate the influences of American agricultural education student teachers on a rural community in New South Wales, Australia. The study analyzed interviews with eleven participants of the American student teacher program in a rural New South Wales community. Two researchers worked together to complete this study. Both researchers were student teachers in the New South Wales community for ten weeks and taught agriculture in one of the community's two high schools. After one year, researcher one returned to the community and interviewed eleven individuals involved with the program. The interviewed participants were questioned based on a predetermined protocol. The interviews were transcribed, coded, and categorized into themes by researcher two. Using participatory action research and a modified grounded theory approach, the researchers were able to identify areas of influence suggested by participants. The participants identified nine areas of influence made by the American agricultural education student teachers within the school and community: cultural awareness, stereotypes, language, classroom distractions, teaching methods awareness, cultural changes in community members, student performance, community unification, and impact of student teacher presence.

Introduction

When two cultures are in contact with one another, new ideas and systems are shared. As a result, both cultures are influenced by one another. Furthermore, this influence extends to neighborhoods or communities. Homan (1999) noted that neighborhoods continuously change and Benokraitis (2009) suggested culture changes and adapts to various circumstances, including diffusion, discovery, and external pressures. But more importantly, when a culture is changing, how individuals respond to those changes is dependant on the community environment. Sarason (2000) commented "psychology is the detection, delineation, and understanding of how changes internal to people, as individuals or collectivists, transact with changes in external social-physical contexts" (p. 920). Therefore, psychology becomes significant to community change.

Psychology has been described as "the science of mental life" (Butler & McManus, 1998, p. 1). In other words, psychology is concerned with thoughts and feelings. Carmichael (1957) claimed that psychology explores mental processes that can be generalized to all men and, based on generalizations, recognizes the way men are alike and different. In addition, thoughts and feelings of individuals are unique. Therefore, people have different perceptions of the same circumstances. As a result, a need for formal psychology arises. Since any science, including psychology, is "only as good as the *data* on which it is based" (Butler & McManus, 1998, p. 8), it becomes critical that methods be used which will allow psychologists to determine which understanding is most likely to be accurate. To this effect, psychologists attempt to separate what are the subjective views of individuals from the facts (Butler & McManus).

Social psychology is “the scientific study of those aspects of human behavior and experience that pertain to other people” (Marcuse, 1954, p. 182). By this explanation, one may think of psychology as social psychology since human behavior is affected by others. MacLeod (1954) stated that social psychology begins with the individual and focuses on basic mental functions. On the other hand, sociology, begins with societal structure, organization, and development which are viewed as most important. Social psychology is a combination of psychology and sociology but it is important to distinguish that social psychology is different for each person based on customs, morals and values which influence individual developments (Marcuse). In addition, people also develop socially based on their surroundings and influences such as stereotypes, language barriers and cultural awareness.

A stereotype is “a summary impression of a group of people in which a person believes that all members of that group share a common trait or traits” (Tavris & Wade, 2001, p. 423). From stereotypes, assumed characteristics of the group are assigned to its members. Furthermore, individuals may assume all or most of the beliefs about a particular group or stereotype (MacLeod, 1954, p. 211). When people assume all stereotypes to be true, they miss the importance of individuality between group members. Stereotypes may be able to reflect the truth, but they may also distort reality.

For years, the influence of language on human action has been debated. The degrees of influence are widely disputed among linguistic scholars. Some feel that language and culture are virtually inseparable while others feel the two have little impact on each other (Casasanto, 2008). Nevertheless, one idea seems to be common among debates: language and culture do have some form of relation.

Homan (1999) outlined several needs of cultural awareness between groups and emphasized the importance of acknowledging cultural differences. In addition, Homan noted that in order to successfully work together, individuals must have a basic understanding of other’s values and opinions. Likewise, cultural awareness is needed in education. Merryfield (2004) explained that cultural learning assists students in understanding the activities and thoughts of other people. Additionally, Merryfield stated that cultural learning of students develops lifelong skills for cooperating with individuals who hold a different set of values and beliefs. Ford and Whiting (2007) explained “the culturally competent individual or organization seeks to develop new educational models and approaches based on culture....Attitudes, policies, and practices are three major areas where development must occur if an individual or organization is to move towards cultural competence” (p. 54).

In this age of globalization, greater attention has been placed on increasing individuals understanding of international affairs. Within the realm of education, this trend is no different. According to Alfaro (2008), in recent years, it has become “increasingly clear that there is an awareness of the need for the globalization of teacher education programs . . . to prepare globally minded teachers for service in the United States” (p. 20). As globalization becomes an increasing focus, it is imperative that teachers and teacher education programs embrace the opportunities to widen their perspectives of world cultures.

Based on the gap in international student teaching experiences in agricultural education, the University of Tennessee partnered with Charles Sturt University in Australia to provide opportunities for agricultural education student teachers to complete a portion of their student teaching in Australia. Considerable research was conducted to evaluate the benefits to student teachers. Benefits to student teachers included increased awareness of teaching, culture, and (Fritz & Little, 2007). International teaching experiences have proven to be positive in other academic areas as well. Sandell (2007) reported over two-thirds of participating international student teachers had increased knowledge in the areas of professionalism, international perspectives, and personal development.

While the impacts of international experiences on student teachers have been widely evaluated, the impacts of those student teachers on the communities in which they reside have received less attention. Nevertheless, students, schools, and communities cannot be successfully separated. As stated by Wright and Smith (1998), "school, and community environments may support each other and be mutually beneficial" (p. 146). Therefore, it must be considered that international student teachers in any community could make some impact on that particular community.

As part of the learning process, international student teachers should obtain a greater understanding of how cross-cultural experiences can influence the U.S. and the international community. International student teachers should be able to recognize the possible lasting influences their presence will make. Furthermore, the benefits and risks involved with joining two cultures, through education, should be evaluated. Thus, a study examining the impact of international student teachers on the communities in which they work is needed (Fritz & Little, 2007).

Purpose

The purpose of this study was to evaluate the impacts of American agricultural education student teachers on the rural community in New South Wales, Australia. The study examined influences made by American agricultural education student teachers on the students, parents, school administrators, and community members in a rural community in New South Wales.

Methodology and Procedure

As stated by Creswell (2009), three basic research methodologies exist for use by scholars: qualitative, quantitative, and mixed methods. Researchers were concerned with community changes as a result of American agricultural education student teachers being infused into a rural community in New South Wales, Australia. Researchers were interested in how community members were personally influenced and how the community as a whole was impacted. Therefore, the qualitative method was selected as the method for which to acquire information.

The uniqueness of the research called for the use of two qualitative research methodologies. First, researchers were active participants in the New South Wales community; therefore, the role of action research was utilized. Participatory action research is a subdivision of participatory research which requires members to engage in research while adding an element of social action to assist in social or systemic change (Taylor, et al., 2004). When using this method, some provision is made to allow participants to aide in the development of the research question. "This type of reflexivity is a key component of the researcher-participant relationship in any participatory approach" (Taylor, et al., p. 5). As action research participants, both researchers participated in a school improvement plan at their respective schools. However, because the researchers were interested in natural changes, no action research plan was established. Therefore, a second methodology was utilized to ensure an adequate representation of the data.

The second methodology used in the study was grounded theory. From this methodology, theory is allowed to emerge from data (Glaser & Strauss, 1967). Due to the fact that the researchers were primarily interested in themes, identified by participants, grounded theory was selected. However, financial constraints limited researchers to only one series of interviews. Nevertheless, the researcher did revisit the interviews each time a new theme emerged in search of supportive documentation.

During the spring of 2006, the two researchers spent ten weeks as American agricultural education student teachers in the New South Wales community, Australia. During this time, both researchers were involved in improvement projects at their respective schools. Furthermore, the researchers participated in community events such as town meetings, educational forums, and cultural activities. The researchers also spent time in the homes of community members. Newspaper articles and radio interviews were published focusing on the presence of the American agricultural education student teachers.

After returning home, researcher one returned as a full time student in pursuit of a Master's degree. Researcher one sought for and received IRB approval on February 19, 2007 to return to the community in New South Wales. Researcher one, along with sociology expert Dr. Frank Leuthhold, created an interview protocol to serve as a guide during the interview in the event that participants did not provide rich descriptions. However, the questions listed in the protocol were not asked verbatim during the interviews. Instead, researcher one used open-ended questions which focused on the influences of the American agricultural education student teachers in the rural New South Wales community.

One year was allowed to elapse between the American student teacher exchange and the interviews. This time frame accommodated for completion of one academic year in hopes of obtaining a better analysis of program impacts. Furthermore, the timing was partially dependent upon the availability of funding.

Researcher one departed on February 22, 2007 for New South Wales, Australia to conduct interviews with eleven community members. Prior to interviewing, each participant signed an informed consent assent form. Participants were selected based on their involvement with the student teaching program and the community.

Principals from each participating school were selected to represent their school. Both of these individuals, DeWayne and Terry, were critical characters in the development of the program. One deputy principal, James, was also selected based on his involvement with the program. Two mentoring teachers, Kathy and Robbie, were selected based on their involvement with the American agricultural education student teachers in the classroom. Principals identified parents and teachers who could provide valid feedback related to the study. Thus, two parents of separate students, Debbie and Sherry, were selected. One math teacher, Gary, and one related art education teacher, Aaron were also selected. One school support staff member, Martin, was also identified as a beneficial participant. Finally, one area businessman, Preston, was selected to provide an opinion not related to the educational setting.

The interviews were conducted from February 23 – March 8, 2007. Each interview lasted approximately 30 to 60 minutes. The interview questions attempted to identify changes in the community observed by participants during the student teaching experience and after the departure of the international student teachers. The interviews were recorded and transcribed at a later date.

Researcher two was responsible for the transcription of interviews. In addition, researcher two coded and assigned themes. The researcher then utilized thematic analysis and was responsible for a subsequent review of literature to follow up the findings of the study. Glesne (2006) defined thematic analysis as "a process that involves coding and then segregating the data by codes into data clumps for further analysis and description" (p. 147). As a result of this process, nine themes emerged: cultural awareness, stereotypes, language, community unification, student performance, classroom distracters, teaching awareness, cultural changes in community members, and impact of student teacher presence. Finally, researcher two prepared a written report of the findings and offered conclusions of the study.

Glense (2006) described research validity as the "trustworthiness" of the research. In order to establish validity in qualitative research, Creswell (2007) identified eight procedures to be used by researchers. Validity in this study was established using five of Creswell's procedures. First, while the researcher did not spend an extended amount of time in the field while doing the study, the researcher lived in the community being studied for ten weeks. Second, the researcher used interviews, personal notes, and related literature to ensure consistency between various sources. Third, the work of the researcher was reviewed by a peer who is familiar with the project and can thus understand its complexity. The peer reviewer looked for consistency between participant responses and conclusions. The peer reviewer also looked at the conclusions to ensure that the researcher biases did not alter the results. Fourth, the research acknowledged the presence of biases in review of the data, and finally, the researcher provided rich, thick descriptions of the procedures, interview results, and conclusions.

Decrop (2004) declared that dependability "consists of looking at whether the results are consistent and reproducible" (p. 159). Miles and Huberman (1994) identified seven procedures which can help researchers to establish dependability. In congruence with Miles and Huberman (1994), the researcher first outlined three research questions that were imperative to the study. The researcher then outlined the various duties, along with biases, of the researcher. Also, findings among the eleven participants, of various roles, were found to be closely related and were applicable to each participant in the study. In addition, a detailed outline of the theoretical constructs and frameworks were provided. Finally, a peer review was utilized to assist in increasing dependability.

The transferability of this study to other cultures is not expected to yield the same results. "Transferability...is concerned with the extent to which the research findings are applicable to another setting or group" (Decrop, 2004, p. 159). Due to the fact that the community may have a certain degree of influence from previous American agricultural education student teachers, and community members could have become accustomed to the influences of the American agricultural education student teachers, the replication of the study within the same community could yield different results. Nevertheless, if American agricultural education student teachers were sent to another small mining town in New South Wales, Australia and the same research format were followed, similar results could be expected. Because culture plays a significant role in the behaviors of individuals, when people with like cultures share similar experiences, the outcomes are likely to be comparable.

"Confirmability means that the data and their interpretation are not figments of the researcher's imagination" (Mertens & McLaughlin, 2004, p. 107). The researcher in this study identified biases that could have been influential on the reported outcomes. However, in an attempt to strengthen confirmability, a peer reviewer was utilized to decrease the impacts the researcher bias would have on the outcomes. Furthermore, the researcher used the grounded theory method for developing themes. Therefore, the bias of the researcher in identifying themes was minimized and the actuality of the data was able to emerge.

Researcher Biases

The researchers in this study were participants in the American student teacher/New South Wales, Australia program. As a result, the researchers acknowledged that personal biases existed. Due to the fact that both researchers were student teachers in the community, the researchers desired that the influences on the community were viewed in a positive light. On a personal note, the researchers hoped that the influence of American agricultural education student teachers benefited the community in which they worked. Furthermore, researchers also desired that community members would deem the program successful.

Researcher one and two knew several of the community members personally. Therefore, in analyzing the data, each researcher's personal perception of the participant could have been imposed on the meaning of the responses. It is also possible that the interviewer allowed personal knowledge of individual's beliefs to influence the direction of the interview.

Findings/Conclusions/Implications

Based on participants' responses, several themes emerged. Those themes are cultural awareness, stereotypes, language, classroom distractions, teaching methods awareness, cultural changes in the community, student performance, community unification, and impact of student teacher presence.

Cultural Awareness

Merryfield (2004) declared students who are exposed to other cultures, can develop the ability to interact with individuals of a different culture. Kathy (mentor teacher) stated "I think that socially and generally in terms of cultural awareness and kids thinking about the world...this helped the kids to understand the world differently." In turn, students who were involved with the American student teacher program should be better equipped to work with individuals of different cultures.

According to Homan (1999), in order for cultural awareness between groups to occur, all groups involved must acknowledge that there is much to learn from both sides. Likewise, DeWayne (principal) noted that “it was a cultural exchange.” Furthermore, Aaron (teacher) expressed that the program was “a learning tool both ways.”

Community members also benefited from the program. Martin (support staff) noted that “to actually speak to young kids that came from over there [USA], their different aspects of life, is really eye opening.” James (deputy principal) also noticed that due to the American agricultural education student teachers “students were more informed about the U.S....I think everyone goes through cultural changes, and certainly opens their eyes up to certain cultures and different things....You tell me about things that go on in your community, and that certainly opened my eyes, I wasn’t aware of.” Gary (teacher) suggested “it’s a tremendous opportunity to be able to learn something about people from somewhere else, people that don’t exactly live the same life that we do.” Therefore, influences of the American student teacher program reached beyond the classroom and into the community.

Additionally, five participants noted the cultural influence of the experience on the American agricultural education student teachers. These individuals were willing to accept that they had been culturally influenced, but noted that the American agricultural education student teachers had also gained from the experience. The five individuals demonstrated their personal pride of their own culture when they realized American agricultural education student teachers were able to take the New South Wales community culture to their hometowns. This desire for outside approval exemplified dedication and devotion to one’s own culture. The participants also had a tendency to assume American agricultural education student teachers left with a positive impression of the New South Wales community and Australia. This clearly demonstrated the confidence of the New South Wales community members had in their culture.

The New South Wales community desired approval from the American agricultural education student teachers, which speaks highly of the program. The American agricultural education student teachers built a creditable reputation in the community and their opinions were highly respected, as noted by Aaron and Terry. Specifically, Terry (principal) commented that the American agricultural education student teachers had a great opportunity to learn, but “there is not doubt that we [Australian participants] came out on the positive side.”

Stereotypes

Tavris and Wade (2001) noted the importance of stereotypes to the ability of people to quickly assimilate information. However, the quick assimilation of information can often be misleading or blatantly wrong. In the interview with Terry (principal), he discussed common stereotypes of Americans by Australians. He also alluded to the importance of teachers realizing the problems with stereotypes.

> People have preconceived ideas about different cultures....In Australia, you either have people that are very pro-American or very anti-American....Your [interviewer] presence and the other’s presence here has allowed teachers especially to see that you can’t stereotype different cultures. Even if it’s American...you just have to take people as you find them.

Furthermore, Kathy (mentor teacher) stated “I know that when Donald [American student teacher] was just talking with some of the kids about what his life was like in the U.S., it was completely different from what they [Australian students] expected from the movies.” The cultural awareness brought about from the presence of the American agricultural education student teachers resulted in disproving some of the stereotypes toward Americans. James noted “that certainly opened up my eyes. I wasn’t aware.”

While many preconceived stereotypes were altered, new stereotypes were formed. Unfortunately, the new stereotypes were not always correct. Gary (mentor teacher) commented “As a math teacher, I don’t know much about teaching agriculture, but from what I have seen, agriculture usually meant that students aren’t terribly able. And, speaking with some of the American agricultural education student teachers, I’ve found...agriculture is a huge part of the curriculum in the United States.” While Gary’s statement might hold true for certain areas of the United States, certainly agriculture is not a major part of the curriculum in all areas. Nevertheless, the American student teacher that Gary had spoken with described his hometown as having a large agricultural curriculum. Thus, Gary derived a new stereotype based on one town in the United States.

Perhaps Preston (businessman) best identified the benefits of the American agricultural education student teachers to the stereotypes of Australians and Americans alike. His comment suggested that as American agricultural education student teachers and the New South Wales community citizens worked together, stereotypes would be disproved by both groups. In the process, each would learn about the other, but more importantly, learn about self. He shared “I think I understand the country where I was born much more because I listen to all these perspectives.” He further explained that as he eliminated stereotypes and gained realizations, his understanding of his culture increased. Moreover, American agricultural education student teachers and the New South Wales community citizens alike, thought the program not only allowed them to disregard preconceived stereotypes about each other but also assisted in individual understanding of their own culture.

Language

In relation to culture, language is a highly debated topic. Does language influence culture? Does culture influence language? Linguistic scholars for years have debated the relationship between the two. Although a wide array of opinions exists, the underlying factor remains the same and that is that language and culture are interrelated. In regards to culture and language, Martin (support staff) stated, “the first and obvious thing is the different tone of voice and accent....the words you [American agricultural education student teachers] come out and say are very Americanisms.”

Aaron (teacher) believed the language difference was beneficial to students and student teachers. Twice he commented, “I think our students are motivated when the American agricultural education student teachers are in the classroom because...they are different, they’ve got a different way of speaking” and “students do respond a lot differently....American teachers are new faces to the school...they have a different way of speaking.” Likewise, Terry (principal) felt that the interest of students was heightened by the difference in language. In regards to high school students, he commented “with the teenage kids, they are more interested with the accents.”

Terminology differences may appear to be insignificant; however, the ability to respect small differences in language and build a respect for an alternative form of communication is the beginning stages of cultural awareness. The ability to communicate, despite variations, is critical to successful interactions. Therefore, community members and students had the opportunity to successfully discuss business transactions, educational opportunities, and social dilemmas. As stated by Robbie (mentor teacher) “the accents were a lasting impression.” While it may seem unimportant to share various terms and accents, acceptance of another’s language is the acceptance of another’s culture.

Classroom Distractions

Regardless of cultural differences or likenesses, distractions in the classroom always occur. Behnke (1981) noted that classroom distractions may exist in many forms. For example, distractions come from students, visitors, staff members, and special activities. Likewise, Ahrentzen and Evans (1984) noted both visual and kinetic stimulants prove to be classroom distractions.

“The kids wanted to find out things...it’s natural for kids,” Robbie acknowledged. However, in regards to cultural awareness, the ability of students to ask questions proved to be beneficial. James (deputy principal) noted “I don’t think they’re distracters. I think what was taking place was just normal general classroom participation.” Furthermore, Robbie (mentor teacher) acknowledged that students were “distracting the teachers by asking about America....You can’t kind of stop on that...but you got to be able to control it.”

Thus, it can be concluded that American agricultural education student teachers did cause some distractions within the classroom. However, those distractions were not considered negative distractions and some distractions were minimal. The participants in the study felt student enthusiasm for cultural inquiry were of more benefit than harm. Beyond the cultural awareness that was brought forth in the program, participants believed classroom distractions were normal and would have existed with or without the American agricultural education student teachers.

Teaching Methods Awareness

Studies have shown that various teaching methods are important to the cognitive learning of students (Bovy, 1981; Tobias, 1982; Mayer 1999). Tobias claimed certain instructional variables lead to a greater level of achievement. Likewise, Mayer declared the design of instruction contributes to the cognitive learning of individuals.

DeWayne (principal) stated “I thought it was a great idea, because it made my staff exposed to different ideas and different teaching strategies from overseas.” He also believed the program benefited staff members because they would “pick up different teaching techniques from watching and observing other people....Let staff observe different practices, and it gives them the opportunity to reflect on their own practice.” When asked how he felt about the American agricultural education student teachers, Gary (teacher) replied “it’s been a very positive experience for me....I’ve certainly enjoyed speaking with them, finding a little bit more about...how they approach the study of teaching." The presence of the American agricultural education student teachers provided the opportunity for Australian teachers to look at their own teaching methods, while acquiring new teaching methods and ideas. As a result, having the American agricultural education student teachers in the classroom proved beneficial to the Australian teachers.

Cultural Changes in Community Members

Participants were hesitant to respond to questions related to cultural change. Various communities may be acceptant or resistant to change (Harrison, 2000). DeWayne (principal) stated "In Australian schools, the cultures move so slowly." Nevertheless, education is the institution through which social change occurs (Benokraitis, 2009). When asked if things in the school had changed as result of the program, Preston (businessman) responded

> I think it will take some time, to know...It will take a long time before it happens, you really need someone from here to pickup the challenge and go abroad or go out and go elsewhere, come back and say hey, there is a wide world out there.

DeWayne (principal) shared very similar views in regards to cultural change. "School culture is...I've been here 3.5 years and I'm struggling to change some of the cultures in the schools....." However, he later added "You've got to look deeper for cultural change. You have to learn the system of how people think. The way people interact or a change in process."

Cwick and Benton (2009), identified programs in the school that persist, eventually impact the community. Terry (principal) said "In the ten weeks last year, there is no doubt that there was a very positive impact on school....The things that [happened] impacted the whole school." Likewise, James (deputy principal) stated "I think everyone goes through cultural changes and certainly opens their eyes up to certain cultures and different things." Thus it can be concluded that even though there was some resistance to admit cultural changes, some degree of cultural change did occur. Moreover, with the continuation of the program, further cultural changes are likely.

Student Performance

Participants noted positive impacts on the performance of the New South Wales community in regards to influences of American agricultural education student teachers on the performance of students. Parents noted their children were more interested in learning due to different perspectives the American agricultural education student teachers offered. Sherry (parent) said "students tend to sit back and listen." Therefore, the presence of individuals from a new culture may cause students to focus better.

Overall, teachers noted a change in student performance. Kathy (mentor teacher) commented "behavior wise, they definitely have done better than usual," and they were "a lot more engaged than they were in most lessons that I've seen previously. So overall, yes they performed at a higher level." Aaron (teacher) was also decisive in his comments. When asked if students responded differently with American agricultural education student teachers in the classroom, he responded "Yes, definitely. I believe that when American teachers are in the school and in the classrooms, students do respond a lot differently than they do with their normal teachers."

Robbie (mentor teacher) also commented that having American agricultural education student teachers in the school "certainly stimulated interest both student wise and staff wise." Thus, it can be concluded that the presence of the American agricultural education student teachers encouraged students to perform better academically and behaviorally.

Community Unification

Within the realm of psychology, much research has been conducted on communities. However, from this study emerged a new concept that the presence of people from a different culture would cause a community to merge. According to Kathy (mentor teacher) "the political stuff that had been going on for a very long time was dumped underneath the carpet. People...want[ed] to impress you guys and show you how wonderful we all were...everyone was on their best behavior." The focus of the community during that time was making a positive impression on American agricultural education student teachers.

Other participants also acknowledged that the presence of the American agricultural education student teachers forced community members to ignore differences and assist in accommodating the student teachers. Sherry (parent) observed "I really do think that when the American students were here that people were motivated to try and do their best." To the same effect, Preston (businessman) noticed with the presence of American agricultural education student teachers there were "less caustic remarks and less kind of snide remarks...it's not because they don't want to make them...it's because, oh, the Americans are here, let's not do it. But maybe that is a positive thing."

Therefore, one can conclude that due to the collectivist nature of Australians, they were able to put aside their differences to function as a group in hosting American agricultural education student teachers. Several participants noted that they desired for American agricultural education student teachers to return home with a positive impression of their community and school. The unification in this situation did not occur because of some detailed program set forth. Instead, the New South Wales community joined as a collectivist society, to showcase their community in the best light.

Impact of Student Teacher Presence

Participants in the study gave final remarks concerning the presence of the American student teacher program. The program was identified as a success. Aaron commented "they made a very positive impression. They were very confident. They were liked. And, they were very professional." Gary (teacher) added "I don't think there are any negative, long-lasting things that I can remember. I miss...the positive energy that the student teachers gave me as they were young people starting out their careers." Terry (principal) also showed much enthusiasm and approval for the program. "I think it's terrific because from what I heard last year, the people were of high quality." He later continued "all I've heard is positive stuff, and the quality of people that [were] here is exceptional, I mean, the American people. It's all positive." DeWayne (principal) offered a quick but similar response "we'd love to have you back."

Future Research Questions

Educational researchers look at the impact experiences have on teachers but often time overlook how the community is impacted. This study confirms that while the American agricultural education student teachers had a positive impact on the community, there were some distractions as well. However, based on this study, a few questions surfaced. Those research questions that need further investigation are:

- What impact did American agricultural education student teachers have after five and ten years had elapsed from the first student teaching experience?
- After five and ten years, are the New South Wales community members more receptive to international visitors?
- As the number of American agricultural education student teachers to the New South Wales community increases, what cultural changes were accepted by community members?
- After ten years, how do student participants perform in comparison to non-student participants?

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Adding Value to Professional Conferences for Graduate Students

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Abstract

Graduate students are a critical component to the agricultural education profession and it is necessary to ensure that conferences provide valuable professional development to its future leaders. The purpose of this descriptive research was to assess Agricultural Education graduate students' perceptions of and to determine the factors influencing attendance at AAAE conferences. Sixty-six graduate students responded to a national online survey in the fall of 2009 for a 55% response rate. Results of this study indicated networking and employment opportunities were the most important reasons why graduate students attend professional conferences. The majority of graduate students attending conferences were PhD/EdD students pursuing higher education faculty positions. Research paper sessions and professional development workshops were the two highest rated conference activities, while the graduate student meetings and special interest group were ranked the lowest. Qualitative comments indicated the need for additional networking opportunities and more structured needs-based graduate student meetings. These findings offer useful information for AAAE faculty coordinators to plan valuable graduate sessions, programs, and activities at future conferences.

Introduction/Literature Review/Conceptual Framework

Within the American Association for Agricultural Education (AAAE), members value the importance of professional development, as evidenced by annual conferences within the three regions of the organization, as well as the national conference. A cursory review of conference agendas and conference business meeting minutes revealed that an overwhelming majority of AAAE members attended at least one of the AAAE-sponsored conferences for each of the past several years. Such anecdotal evidence was indicative of the value AAAE members placed on professional development and research-sharing opportunities provided through the various conferences of the organization.

Interestingly, a review of the research paper proceedings and poster presentations for the north-central, southern and western regions as well as the national research conference proceedings revealed numerous authors/presenters were not faculty members, but graduate students. Few would question the value of involving graduate students in these research and innovative-idea sharing opportunities. However, there was a question as to the professional development value of regional and national AAAE conferences, beyond the research and poster sessions, for the graduate students.

VanSandt and Anderson (1992) noted professional conferences provided both personal and professional growth opportunities. "Through meeting new people, you create opportunities for your own growth and build a network of resource people and a support system" (2). Aitkin, Novak, Characklis, Jones and Vieksland (2004) listed benefits of professional organization conferences, including sense of identity, recruitment, personal and career development, networking, formal and informal information exchange, and research, teaching and practice connections.

The meeting participation model (Lee and Back, 2008) provided a framework for this study. The model hinges on the concept that association members make meeting participation decisions consciously, therefore “their plan to attend the meeting can be affected or altered through changes in attitude and perceived social norms that contribute to the formation of meeting participation intention” (p. 308). The meeting participation model included five constructs: attitude, subjective norm, perceived behavioral control, destination image, and past experience. Lee and Back (2008) recommended utilizing strategies to encourage first-time members’ attendance as well as to focus on the benefits the sponsoring organizations or individuals receive through allowing meeting attendance.

Knight (2002) noted the importance of formal and informal student interactions at conferences, whereby students have the opportunity to share together and discuss with one another what they have gleaned from conference sessions. Additionally, Knight noted the students had opportunities to meet future professional colleagues. Apul and Tufenkji (2007) reported graduate students desired access to regional and national conferences for similar reasons to Aitkin, et al: networking, real-world experience, targeted membership and organizational service. Further, conferences were listed as one of the key reasons graduate students would join a professional organization. Perhaps most interesting was the Apul and Tufenkji finding that graduate students perceived networking as not only interacting professionally with professionals and faculty members, but also connecting with other students.

The American Society of Horticultural Sciences provided a workshop for graduate and undergraduate students attending the 2008 ASHS professional conference. The pre-conference workshop, facilitated by an ASHS member, targeted undergraduate and graduate students with information about the various components of the conference so the students could “gain the most from their conference experience” (ASHS, 2008, p. 1054). An additional student-oriented workshop during the annual ASHS conference sponsored by the ASHS Collegiate Activities Committee was entitled *Student Career Forum: Options, Q & A, …*, with the objective “to expose students to some of the career options in horticulture and provide a forum for students to ask questions and get answers from a panel of professionals in horticulture” (p. 1061).

Barrick, Clark and Blaschek (2006) discovered faculty and graduate student agreement on the importance of faculty members providing opportunities for graduate students to attend professional meetings. However, the data revealed graduate students perceived the faculty members should be more proactive in providing those professional development opportunities. Additionally, Barrick, Clark, and Blaschek reported graduate students believed their ideas were not treated with due respect by faculty mentors and that graduate students preferred to receive more assistance in preparing publications.

Other researchers acknowledged the importance of helping graduate students develop research skills (House & Sterns, 2003; Shelton, Ahern, Piirto & England, 2006). Likewise, the importance of preparing graduate students outside classroom settings was noted by McKenna, Reed, Fulcher and Mankolo (1993) and, Skelly, Kohlleppel, Kane and Bradley (2002). However, the focus was primarily on field and laboratory operations rather than professional development and peer contact. Mentoring was noted as essential in the faculty member-graduate student relationship (Dodson, Fernyhough, & Holman 2006; Shelton et al., 2006; Kilmer, Hoover, & Connor, 1997), however this was not included professional conferences as part of the mentorship process. Based on the involvement of master's and doctoral level graduate students in regional and national Agricultural Education professional conferences, the importance of such involvement for the professional and career development of the students was accepted. However, there was little evidence regarding the best practices for accomplishing that professional development and career mentoring.

Purpose and Objectives

The purpose of this research was to assess agricultural education graduate students' perceptions and to determine the factors influencing attendance at AAAE regional and national conferences. This purpose was accomplished through the following specific objectives:

1. Determine selected demographic characteristics of graduate students who attended the AAAE regional and national conferences in 2008-2009;
2. Determine the graduate student attendees perceptions of professional development activities at AAAE regional and national conferences in 2008-2009;
3. Determine graduate students attendance patterns at AAAE regional and national conference in 2008-2009
4. Determine participants' perceptions of graduate student meetings at AAAE regional and national conferences in 2008-2009

Methods and Procedures

Methodology
The population for this study was graduate students who attended a regional and/or national agricultural education affiliated professional conference in 2008-2009. A census of 127 participants was obtained from the official list of attendees provided by each regional conference chair and the national chair. Due to inaccurate and incomplete lists, the final sample consisted of 120 graduate students. The instrument was researcher-developed based upon needs and curiosities of agricultural education faculty and graduate students at Montana State University. The instrument was designed on SurveyMonkey™ with specific focus on how to add value to professional conference participation for graduate students. Questions were derived from literature on conference participation and student professional development (VanZandt & Andersen, 1992; American Society for Horticultural Science, 2008; Skelly et al., 2002). Survey questions were created to determine attendance patterns at AAAE conferences, opinions on the conference sessions and activities, factors that added or decreased value to conference experiences, and gain insight into professional development opportunities. The survey was assessed for validity by a panel of university faculty. Ten agricultural education graduate students who had not attended an AAAE conference participated in a pilot test to assess reliability. A Cronbach's alpha was also calculated on the instrument and revealed a reliability coefficient of 0.81. Following the validity and reliability assessments, several questions were restructured.

Data Collection
The survey was disseminated using the web-based host Survey Monkey™ and consisted of 25 questions divided into four sections. Section one centered on participants' graduate program

background and sought to determine their participation levels in professional conferences. Sections two and three included specific questions about participation in a 2008-2009 AAAE Regional Conference and/or the 2009 AAAE National Conference. These two sections assessed respondents' perceptions of the value of conference sessions and activities. The last section focused on participants' insight into ideas for future conferences. Researchers utilized a modified version of Dillman's (2000) tailored design method. An introductory e-mail was sent via Survey Monkey™ to 120 graduate students who met the criteria of having attended a regional and/or national AAAE conference in 2008-2009. This correspondence informed potential participants they had been selected for the study and included background information about the study, the informed consent form, and a web link to the survey. Participants gave voluntary consent by clicking on the link to complete the survey. One university blocked emails from Survey Monkey™ , therefore a copy of the email was sent through a personal email and responses were combined in the results section. The survey remained active for 30 days and non-responders/late responders were sent two reminder emails two weeks apart. Because the response rate was less than 80%, researchers chose to contact 5 to 10% of the sample to gather data to address the non-response as recommended by Tuckman (1999). A random sample of 10 non-respondents was contacted via personal email to answer critical questions on the survey. After comparing answers, no differences were found between respondents and non-respondents in a way relevant to the study.

Data Analysis

Data were analyzed using SPSS 18.0 software package, Microsoft Excel, and Survey Monkey™. The data collection period was from September 22, 2009 to October 22, 2009. Responses were filtered through Survey Monkey™ to only include current graduate students during the 2008-2009 school year and fully completed surveys. After eliminating duplicates and partial responses, the survey yielded a 55.0% (N=66) response rate. Survey Monkey™ allowed the researchers to report descriptive statistics by providing charts and graphs based on each question. For further analysis, data were downloaded into Microsoft Excel and SPSS to calculate means, standard deviations, and reliability coefficients.

Findings

Objective 1: Determine selected demographic characteristics of graduate students who attended the AAAE regional and national conferences in 2008-2009.

Based on registration lists obtained from regional and national conference coordinators, 120 graduate students comprised the study sample. All respondents were enrolled as graduate students during a semester or quarter of the 2008-2009 school year. Twenty-eight percent of the respondents (n=19) were Master's students; 63.6% (n=42) were PhD/EdD students; and 7.6% (n=5) were in combined Master's and Doctorate programs.

The suggested length of participants' graduate programs was reported as 1-2 years by 27.3% of respondents (n=18); 2-3 years by 25.8% (n=17); 3-4 years by 40.9% (n=27); 4-5 years by 4.5% (n=3); and more than 5 years by 1.5% (n=1). When asked about the number of semesters completed in graduate school, 18.2% (n=12) completed 1-2 semesters; 40.9% (n=27) completed 3-4 semesters; 15.1% (n=10) completed 5-6 semesters; 9.1% (n=6) completed more than 6 semesters; and 16.7% (n=11) had completed all degree requirements.

Participants were asked to identify their career goals and research topic areas. The career goals reported were as follows: 19.7% (n=13) were pursuing extension, 16.7% (n=11) were pursuing high school teacher or administrator; 16.7% (n=11) were pursuing industry positions; 12.1% (n=8) were pursuing non-profit work; 15.2% (n=10) were pursuing government; 15.2% (n=10) were pursuing PhD/EdD programs; 72.7% (n=48) were pursuing higher education faculty; and 15.2% (n=10) were pursuing international development. Respondents were asked to categorize their research topic into one of the National Research Priority Areas (Table 1).

Table 1
Graduate Student Research Topic Areas According to National Research Priority Agenda (N=66)

Topic	*f*	%
Agricultural Education in University and Postsecondary Settings	16	24.2
Agricultural Education in Schools	13	19.7
Agricultural Communications	12	18.2
Agricultural Education in Dom. & Int. Settings: Extension and Outreach	10	15.2
Agricultural Leadership	9	13.6
Other	4	6.1
Undecided	2	3.0

Objective 2: Determine the graduate student attendees perceptions of professional development activities at AAAE regional and national conferences in 2008-2009.

Participants were asked to rate the usefulness of regional conference activities to professional development using a 5-point Likert-type scale (Table 2). Means and standard deviations were calculated. Only 51 respondents answered this question because 15 have not attended a regional conference. If respondents did not attend the conference activity or if the activity was not offered, they were not included in the final calculations.

Table 2
Usefulness of Regional Conference Activities to Graduate Student Professional Development (N=51)

Conference Activity	1		2		3		4		5			
	f	%	*f*	%	*f*	%	*f*	%	*f*	%	Mean	SD
Research Paper Sessions	0	0	1	2.0	10	19.6	20	39.2	19	37.4	4.14	0.81
Prof. Dev. Workshops	0	0	4	7.8	7	13.7	11	21.6	9	21.6	3.81	1.01
Arranged Social Events	1	2.0	4	7.8	11	21.6	20	39.2	10	19.6	3.80	0.89
Arranged Local Tours	1	2.0	2	3.9	6	11.8	16	31.4	7	13.7	3.80	0.97
Professional Seminars	0	0	4	7.8	10	19.6	13	25.5	9	17.6	3.75	0.97
Poster Session	0	0	4	7.8	17	33.3	23	45.1	3	5.9	3.53	0.75
General Session	0	0	6	11.8	17	33.3	16	31.4	7	13.7	3.47	0.97

Graduate Student Meeting	0	0	10	19.6	4	7.8	12	23.5	6	11.8	3.44	1.13
Business Meeting	3	5.9	5	9.8	19	37.3	11	21.6	2	3.9	3.10	0.96

Note. On a 5-point Likert-type scale, 1=Not useful, 2=Somewhat useful, 3=Useful, 4=Very Useful, 5=Extremely Useful

Participants were asked to rate the usefulness of national conference activities to professional development using a 5-point Likert-type scale (Table 3). Means and standard deviations were calculated. Only 35 respondents answered this question because 31 did not attend the national conference. If participants did not attend the conference activity, they were not included in the final calculations.

Table 3
Usefulness of National Conference Activities to Graduate Student Professional Development (N=35)

Conference Activity	1		2		3		4		5			
	f	%	*f*	%	*f*	%	*f*	%	*f*	%	Mean	SD
Research Paper Sessions	0	0	1	2.9	2	5.7	13	37.1	18	51.4	4.41	0.74
Prof. Dev. Workshops	0	0	0	0	6	17.1	8	22.9	17	48.6	4.35	0.80
Alumni Events	1	2.9	1	2.9	3	8.6	11	31.4	10	28.6	4.08	1.02
Professional Seminars	0	0	2	5.7	4	11.4	11	31.4	6	17.1	3.91	0.90
Arranged Social Events	0	0	2	5.7	5	14.3	19	54.3	5	14.3	3.87	0.76
Committee/SIG/Bus. Mtg	0	0	1	2.9	9	25.7	13	37.1	7	20.0	3.87	0.82
Poster Session	0	0	3	8.6	5	14.3	22	62.9	3	8.6	3.76	0.75
Opening Session	0	0	5	14.3	8	22.9	9	25.7	9	25.7	3.71	1.07
Graduate Student Meeting	1	2.9	5	14.3	10	28.6	5	14.3	2	5.7	3.09	0.97

Note. On a 5-point Likert-type scale, 1=Not useful, 2=Somewhat useful, 3=Useful, 4=Very Useful, 5=Extremely Useful

Objective 3: Determine graduate students attendance patterns at AAAE regional and national conference in 2008-2009.

Of the 66 total respondents, 34 (54%) were affiliated with the Southern Region, 18 (28.6%) were affiliated with the North Central Region, and 11 (17.5%) were affiliated with the Western Region. Forty-three respondents (65.1%) reported to have attended one or two AAAE conferences, while 33 respondents (39.3%) had attended 3-5+ conferences. When asked about attendance at all professional conferences (AAAE and others), 22 respondents (34.9%) have attended more than five, 31 respondents (49.1%) have attended two to four, and 10 respondents

(15.8%) have attended either one or five. In a check-all-that-apply format, participants were asked the types of all professional conferences attended (Table 4).

Table 4
Professional Conferences Attended by Graduate Students (N=66)

Conference	*f*	%
American Association of Agricultural Education (AAAE)	62	98.4
Other*	24	38.1
North American College and Teachers of Agriculture (NACTA)	19	30.2
Association for Career and Technical Education (ACTE)	11	17.5
Association for International Agricultural and Extension Education (AIAEE)	8	12.7
Association for Communication Excellence (ACE)	8	12.7
Agricultural Communicators of Tomorrow (ACT)	7	11.1
Association of Leadership Educators (ALE)	6	9.5

*Other included State AgEd Conferences, NAAE, SAAS, NAE 4-HA, ASABE, NIFS, ATE, MANRRS, AMS, Outreach Scholarship Conference

Fifty-one (81.0%) of the respondents attended a Regional AAAE conference in 2008-2009. In a mark all that apply format, participants marked the reasons for attending the regional conference (Table 5).

Table 5
Graduate Students' Reasons for Attendance at Regional Conferences (N=51)

Categories	*f*	%
Professional Networking	37	72.5
To learn about research	27	52.9
To present a poster	27	52.9
To present a paper	25	49.0
Non-professional reasons*	14	27.5
Other	3	5.9
Class requirement	1	2.0

*Non-professional reasons included to visit friends, see a new town, location, etc…

Attendance for professional conferences was supported by a combination of the following funds listed in descending order: department (82.4%), personal (58.8%), grants (15.7%), university (11.8%), college (9.8%), and other (9.8%).

Objective 4: Determine participants' perceptions of graduate student meetings at AAAE regional and national conferences in 2008-2009.

Twenty-nine respondents (56.9%) indicated their regional conference had a specific time for a graduate student meeting, and 70.6% of these (n=24) attended this meeting. When asked to categorize the meeting, 23 respondents (85.2%) described it as a meet and greet/social; 11 respondents (40.7%) had guest speakers at the meeting; four respondents (14.8%) described it as professional development; three respondents (11.1%) described it as other; and one respondent (3.7%) described it as service learning.

Thirty-five (55.6%) respondents attended the National AAAE conference in 2008-2009 while 28 did not. Of these 35 participants, 21 (60.0%) attended the graduate student meeting. In a forced choice question format, participants ranked the importance of graduate student meeting activities on a 6-point Likert-type scale (Table 6).

Table 6
Importance of Graduate Student Meeting Activities at National AAAE Conference (N=35)

Conference Activity	1		2		3		4		5		6			
	f	%	*f*	%	*f*	%	*f*	%	*f*	%	*f*	%	Mean	SD
Networking	3	5.7	4	7.5	4	7.5	11	20.8	16	30.2	15	28.3	4.47	1.46
Employment Opp.	8	14.3	5	8.9	6	10.7	9	16.1	14	25.0	14	25.0	4.04	1.75
Research Assistance	3	5.9	7	13.7	16	31.4	9	17.6	7	13.7	9	17.6	3.73	1.48
Prof. Skill Devlpmt.	3	5.4	12	21.4	11	19.6	15	26.8	8	14.3	7	12.5	3.61	1.44
Educational Seminars	4	7.5	16	30.2	12	22.6	6	11.3	10	18.9	5	9.4	3.32	1.50
Graduate Student SIG	29	46.8	8	12.9	6	9.7	7	11.3	7	11.3	5	8.1	2.52	1.76

Note. On a 6-point Likert-type scale, 1=Not important, 2=Somewhat important, 3=Important, 4=Moderately Important, 5=Very Important, 6=Extremely Important

When asked how graduate student meetings should be structured at future conferences, participants ranked the following choices in descending order: 59% (n=36) desired a meet and greet at the beginning of the conference; 58.3% (n=35) desired various sessions throughout the conference; 56.7% (n=34) desired a graduate session during a business meeting; and 55.2% (n=32) desired all graduate students to sit together during a meal. Additionally, 69.8% of the respondents (n=44) also indicated they would like to have one to two graduate student activities during a professional conference.

In a short answer format, participants were asked how graduate student meetings could be improved at professional conferences. Comments from 26 respondents were summarized into three themes: (a) Adding more structure and content to graduate student meetings by having a formal agenda, leadership, planned program activities, and useful information to take home; (b) Focus the meeting on needs-based topics to improve professional development, research, and teaching skills in order to better prepare students for future careers; and, (c) Provide additional formal and informal networking opportunities for graduate students to interact with each other and faculty members.

Table 7
Participants' Ideas for Improving Graduate Student Meetings at Conferences (N=26)

Themes
More structure and content
"Have more than one graduate student meeting"
"Better promotion and organization of graduate student meetings prior to conference
"Have presentations, handouts and take home materials that may help grad students when they go back home"
"Have a designated student leader to serve as a point person for students"
"Provide more structured events, meetings, and activities led by faculty member or experienced graduate student"
"Make them more than a meet and greet. Add some substance to the program and make it meaningful to be there"
"Have a formal agenda for graduate student meetings. A well-thought out program would allow students to receive proper benefit after leveraging time to attend"
Needs-based meeting topics
"Survey the graduate students to determine interests"
"Create a meaningful program"
"Have a specific professional development session for graduate students"
"Keep sessions for graduate students with an objective to improve their professional skills and research skills for the future when they will work as faculty or educators"
"Provide incentives with unique opportunities for attendance and be creative with rewards"
"Sending out questionnaires like this one to see what are the needs of graduate students"
"Give graduate students something useful to walk away with. Something unique that they can't get at their home campus"
Provide additional networking opportunities
"Create a more accepting atmosphere of graduate students that encourages interaction"
"Have more organized social activities"
"Allow more time for graduate student interaction. The current meetings are rushed and there is little time to converse"
"I would also like to see activities that allow graduate students and professionals to meet and greet/network; I would also like to see more focus on pairing students with professionals in a mentoring relationship for added assistance"
"Schedule small get-together activities. The "parking lot" conversations have been most beneficial"
"Make the meetings more informal"
"Encourage all regions to include graduate student meetings as a time to network and socialize"

Conclusions/Implications/Recommendations

Professional networking was considered the most important reason why graduate students attend professional conferences confirming the research of VanSandt and Anderson (1992). Graduate students placed repeated emphasis on this factor throughout the survey. Although students can participate in scheduled conference activities, it is also important that they have time to visit informally with faculty during the conference. Faculty should acknowledge the significance placed on developing personal and professional relationships and strive to frequently interact with graduate students in different ways. This interaction can be done formally in conference sessions, meetings, workshops, and panel discussions, as well as informally at social activities, tours, and session breaks. These opportunities allow for information exchange and assist in building relationships that can benefit both faculty and students in the future. Conference coordinators should consider including these types of events in the schedule in order to provide both formal and informal networking opportunities.

Beyond networking, other closely ranked reasons to attend conferences were to learn about research and present a paper or poster. These findings reinforce the value of graduate student involvement at the conference beyond attendance. These unique opportunities help to build confidence, improve research skills, create a sense of identity, establish professional connections, and enhance the overall graduate program experience (Aitkin et al., 2004).

The majority (63.6%) of graduate students attending conferences were PhD/EdD students, and when asked about career goals, 72.7% indicated that they were pursuing higher education faculty positions. With this high number of doctoral students pursuing professional positions, it is critical that conference coordinators allow time for graduate students to visit with faculty about career opportunities; this time also offers an excellent opportunity for faculty recruitment (Aitkin et al., 2004). Additionally, the inclusion of a career workshop, similar to the 2008 American Society of Horticultural Sciences conference, that exposes students to professional options and allows them to ask faculty questions could be a valuable experience.

All participants rated the same top two conference activities as being very to extremely useful for professional development. The highest rated activities were research paper sessions and professional development workshops. Therefore, graduate students should continue to be encouraged by advisors to submit and present papers at conferences in order to gain experience and establish their professional identity. Professional development workshops should also incorporate topics valuable to both faculty and graduate students and possibly be divided into two separate sessions. It might be useful for faculty to submit separate professional development workshop proposals so that the sessions can meet the specific needs of each audience. The lowest rated activity at regional conferences was the business meeting and was ranked by more than half of the respondents as the desired time to offer a graduate session. These results indicate this could be an appropriate time to offer a professional development session specifically for graduate students.

At the national conference, the graduate student meeting was the lowest ranked activity, while 59.7% of respondents also rated the graduate student special interest group as least important. This data indicates the need to re-examine the quality and focus of these graduate student events. If conference coordinators are to provide valuable career and professional development for graduate students, then faculty must reconsider the needs of graduate students at professional conferences and structure activities to better educate its future leaders. Further research on the professional and career development needs of graduate students can assist in providing a direction for coordinators as they plan regional and national conference agendas.

Qualitative comments indicated the need for more structured and topic-based graduate student meetings. The development of a student leadership team that provides direction to the overall graduate program could be a used to plan meeting content, events, and networking opportunities each year. The idea of creating a newsletter might also be an additional opportunity for students to contribute to the organization and collaborate with faculty. This graduate leadership structure has been successful in other organizations, such as the Association of International Agricultural and Extension Education, and should be considered for AAAE members as well. More than 50% of the respondents stated that they would like to have a meet and greet, multiple sessions, a graduate session during a business meeting, and a meal when all graduate students sit together. Coordinators should include these kinds of events in the schedule to maximize the value of the conference for graduate students. A separate evaluation for graduate student attendees should be conducted at the end of conferences to evaluate the success and value of these activities.

The results of this graduate student study corroborated the meeting participation model (Lee & Back, 2008), most especially the constructs of attitude, perceived behavioral control, and destination image. These constructs should be taken into consideration during promotion of the conference. Networking and employment opportunities were ranked as the most important activities at the national conference; therefore additional focus should be placed on how to improve these targeted areas. As mentioned, formal and informal opportunities to network and socialize should be incorporated into the agenda. The establishment of structured graduate student meetings as well as informal social events can assist in providing the time for this desired interaction. The creation of a faculty- student or student-student mentoring program might also encourage relationship building important for future employment. Mentoring programs can provide an essential link to prepare graduate students for the agricultural education profession and its future leadership. All conferences offer a unique outlet for interactions between faculty and graduate students and should continually be re-assessed to determine how to improve the experience for attendees. As Apul and Tufenkji (2007) reported, graduate students attend conferences to network and gain real-world experiences; therefore, it is the responsibility of the organizational members to create these valuable opportunities for participants.

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Organizational Climate of the American Association for Agricultural Education

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Abstract

Monitoring and evaluation of programs and outcomes is common practice in educational arenas; not so frequent within professional societies and organizations. A clear understanding of the climate of an organization is important; potentially providing leadership with an understanding of how to improve the functionality of an organization. The purpose of this study was to describe how individual members of the American Association for Agricultural Education (AAAE) perceived working together and to describe the level of support given by the profession to the 2007-2010 version of the National Research Agenda (NRA). Overall, AAAE members varied greatly. However, most members agreed to some extent that the AAAE organization allowed members to be involved in the sharing of ideas and information in a nonthreatening, supportive environment. Additionally, most members indicated that within the organization there was an expectation and support of new ideas and practices. Results indicated AAAE members had mixed beliefs regarding the collective accountability for excellence in performance of shared outcomes within the organization. The NRA priorities are well-understood, useful, and worthwhile to a majority of the membership. The data suggest that the average member felt that others in the profession were less supportive than they were about the NRA priorities.

Introduction and Literature Review

Basic organizational principles suggest that the effectiveness and efficiency of any group or organization requires frequent and continuous monitoring for the greatest impact (Senge, 2006). Monitoring and evaluation of programs and outcomes is common practice in educational arenas; not so frequent within professional societies and organizations. By definition, professional organizations are groups of people working together to accomplish a set of goals and objectives that serve the profession. The American Association for Agricultural Education (AAAE) is such an organization.

In recent years, several changes have been implemented seeking to advance desired outcomes. One such change was the development and adoption of the *National Research Agenda of Agricultural Education and Communication* (NRA; Osborne, 2007). The NRA was created in response to a need for prioritizing research areas to create opportunities for securing research funding from numerous state and national agencies. The NRA was the first national research agenda to be developed and formally embraced by the broader discipline of agricultural education and communication. The NRA is organized into five broad disciplinary dimensions: agricultural communications, agricultural leadership, Extension and outreach education, agricultural education in university and postsecondary settings, and school-based agricultural education (Osborne).

University faculty members build relationships and develop professionally through voluntary membership in professional associations. As dues-paying members, the level of participation and the acquired benefits are controlled by the individual through the formalized agreement (Gruen, Summers, & Acito, 2000). Because membership in these associations is voluntary, it is important for the members to be involved in organizational knowledge and socialization. “Comprehension of the organization’s goals and values help link the membership to the mission as a whole” (Gruen et al., p. 39). Research in organizational behavior posits that organizational knowledge has a positive effect because members understand how the organization affects the industry and increases members’ comfort and competence in their roles.

Change is subject to organizational climate and culture. The shared beliefs and perceptions of an organization define its climate. Organizational climate is a feeling by the members; how they perceive something should be done at that moment. The climate of the organization is developed through the commonly accepted policies, practices, and procedures (Anderson & West, 1998). Climate differs from organizational culture. In contrast, culture is the deeply rooted nature of the organization as a result of long-held formal and informal structures, expectations, and traditions. Culture is created through an evolution of a system, with its research presenting detailed description and analysis of the social structure in a holistic manner (Denison, 1996). Whereas the climate of an organization can be relatively easy to change, change in culture takes the full commitment of every leader within the organization for a sustained period of time (Hofstede, 1997).

According to Loo (2003), three conditions must be present for a shared climate to exist: “individuals must interact, must have some common goal which predisposes individuals toward collective action, and sufficient task interdependence” (p. 512). Academic associations meet these criteria on many levels: department, university, region, and national affiliations. Members interact within and outside of their respective departments and universities. The common affiliation with the association is based on interest in a common goal, and potentially, collective action. Finally, the common interest and affiliation create an interdependence that yields a shared understanding.

Theoretical and Conceptual Framework

Social Exchange Theory (SET; Cropanzano & Mitchell, 2005) served as the theoretical framework for this study. SET is considered to be “among the most influential conceptual paradigms for understanding workplace behavior” (p. 874). SET can be used to explain the interactions of people that lead to commitments and relationships. The defining characteristics of SET are interdependence and reciprocity. Interdependence is created when two or more people work toward a common goal, such as priorities in an organization. This interaction results in a reciprocal relationship of give-and-take; for example a faculty member pays dues to an association and in exchange expects a scholarly journals and access to member-only events. The reciprocal exchange does not have to be of equal perceived or economic value. It is valuable to assess the shared organizational climate through the interaction of members and specific organizational goals.

Understanding the climate of a team or organization can provide leadership with a better picture of how a team is operating. Based on that knowledge, changes can be in implemented to improve functionality of the team or organization. However, clearly identifying the climate and its influences on an organization can be difficult. For the purposes of this study, the Team

Climate Inventory (TCI; Anderson & West, 1996) provided a conceptual framework for measuring organizational climate.

The TCI is a multidimensional measure of work climate inventory based on four factors identified by West (1990): Vision, participative safety, task orientation, and support for innovation. Vision is the valued outcome that can serve as a motivating factor. Participative safety represents the ability of group members to be involved in the sharing of ideas and information in a nonthreatening, supportive environment. Task orientation is the collective accountability for excellence in performance of shared outcomes. Finally, support for innovation is expressed through the expectation and support of new ideas and practices.

The TCI is a useful diagnostic tool to identify team development. For example, a low team climate score in one factor, such as task orientation, would provide an organization with the opportunity to seek additional information about quality measures and shared information between group members. Denison (1996) identified quantitative research methods as the best measurement of organization climate because "generalization across social settings not only was warranted but was also the primary objective of the research" (p. 621). Climate research emphasizes the impact of organizational systems on members and organizations rather than social evolution. Researchers must assess member perceptions of organizational goals, vision, and practices in order to draw conclusions about an organization's climate.

As an organization, the AAAE serves educators, communicators, and leaders in agriculture through research and application of its principles. Three goals of the organization "(a) provide an approach to identifying, prioritizing, and organizing research in teaching and learning; (b) provide opportunities for collaboration within and outside of agricultural education; and (c) provide opportunities for individual and organizational growth, development, and renewal" (AAAE, 2010, ¶ 2). Its active members create a formal agreement, through the payment of dues, for access to a scholarly journal, voting rights, committee and leadership participation, regional and national conference participation, and listserv messages.

In 2007 the AAAE entered into a formal agreement with its membership with the publication of a national research agenda (Osborne). The *National Research Agenda* of Agricultural Education and Communication (Osborne) was developed to coordinate the research efforts within agricultural education. Osborne proposed that the NRA was

> … the first national research agenda to be developed and formally embraced by the broader discipline of agricultural education and communication. Members of the profession have long recognized the value of such a document for effectively communicating research priorities to numerous state and national interests… (p. 2).

Furthermore, the *National Research Agenda* of the AAAE is intended to serve as a document that is to:

- convey the research priorities of the AAAE to various stakeholders,
- provide focus toward the most pressing issues facing the discipline,
- facilitate coordination of research efforts between research parties, and
- enhance the perception of the profession as a whole (Doerfert, 2009, p. 1).

The NRA specifically addresses one of the organizational goals: to identify, prioritize, and organize research. As the expiration date of the NRA approaches, it is important that the organization determine the members' perceptions of this agreement, and assess the organizational climate.

Purpose and Research Objectives

A clear understanding of the climate of an organization is important; potentially providing leadership with an understanding of how to improve the functionality of an organization. Furthermore, the inaugural edition of the *National Research Agenda* is set to expire in 2010. Hence, the need to determine the climate of the AAAE membership and the acceptance of the *National Research Agenda* is apparent and timely. Therefore, the purpose of this study was to describe how the AAAE membership perceives working together, and to describe the perceived level of support given by the profession to the 2007-2010 edition of the NRA. The study was guided by the three research objectives:

1. Describe selected professional characteristics—academic position, Research Priority Area focus, regional affiliation, AAAE membership status, frequency of attendance at regional and national AAAE meetings—of AAAE members.

2. Describe members' perceptions of the organizational climate of the AAAE.

3. Describe the level of the profession's support for the2007-2010 edition of the *National Research Agenda*.

Procedures

Population

As part of a larger study, the research design of this quantitative study was descriptive in nature. In the fall of 2009, the on-line *Directory of the American Association for Agricultural Education* included a total of 593 faculty, student, or associate members at the time that the Directory was accessed; of which, 317 were noted as dues paying members who were considered the population for this study. A census of dues paying AAAE members ($N = 317$) was taken to more accurately describe the characteristics of the population and eliminate potential errors associated with subject selection and sampling.

Instrumentation

A four-section electronic data collection instrument was researcher developed by modifying the Team Climate Inventory (TCI) developed by Anderson and West (1996). The modifications to the design and format of the data collection instrument were guided by Dillman's (2007) suggestions using Web-hosted software provided by Hosted Survey™. In the first three sections, subjects were asked to respond to 45 statements or questions using a 5-point Likert-type scale to reflect levels of agreement. The first section consisted of 24 statements representing communication and innovation behaviors within the AAAE. The second section consisted of 13 questions regarding the objectives of the AAAE and the National Research Agenda. The third section consisted of eight questions related to the task style of members of the

AAAE. The fourth section sought to identify subjects' characteristics: academic position, research priority area focus, regional affiliation, AAAE membership status, length of membership in AAAE, frequency of attendance at regional and national AAAE meetings, and length of employment.

Face validity of the data collection instrument was determined by a panel of eight experts; all of whom are considered experts in the areas of agricultural education, instrument development, and research methodology. Construct validity were determined in several previous studies (Anderson, Hardy, & West, 1990; Anderson & West, 1996, 1998; Loo & Loewen, 2002; Mathison, Einarsen, Jorstad, & Bronnick, 2004; West & Farr, 1989) through exploratory and confirmatory factor analysis. Development of constructs and testing of construct validity of the TCI were outlined by West and Anderson (1996), who reported a series of studies (Anderson, et al.; West & Anderson, 1992; West & Farr) that began in 1989 and resulted in the commercial TCI data collection instrument published by Assessment Services for Employment in 1996. Because the items used in this study were based upon the items and constructs previously determined to be valid, the constructs were considered valid.

Reliability of the instrument was previously reported in a series of studies (Anderson, et al., 1990; West & Anderson, 1992; West & Farr, 1989) and outlined by West and Anderson (1996), who reported Cronbach's alpha coefficients for the five constructs—participative safety, support for innovation, vision, task orientation, social desirability—that ranged from .64 to .95 (N = 717). None of the previous studies were conducted in the United States or used a population that was reasonably comparable to the AAAE. Furthermore, the data collection instrument used in previous studies contained several sources of measurement error (e.g., multiple-component or *double-barreled* items), which required expanding the instrument to 51 single-component competencies. Therefore, a pilot test was conducted to estimate the reliability of the modified instrument. Members of an agricultural education department at a Land-Grant University served as the pilot study sample. The sample included individuals engaged in teaching and research in each of the research priority areas (N = 30). To minimize testing bias during the pilot study, all references in the data collection instrument referring the AAAE were changed to the department, and references made to the National Research Agenda were changed to departmental goals and objectives.

Cronbach's alpha coefficients were calculated for the five scales (West & Anderson, 1998)—participative safety, support for innovation, vision, task orientation, and social desirability—yielding coefficient estimates of reliability of .88, .90, .87, .84, and .51 respectively (N = 30). Due to the low reliability estimate associated with social desirability, all items associated with that construct were eliminated from the questionnaire. This reduced the total number of items from 51 to 45, and yielded an overall reliability coefficient for the revised instrument of .95. No reliability indices were generated for static information reflected in section four of the data collection instrument.

Methods/Procedures

This study followed the data collection protocol suggested by Dillman (2007); however, the researchers deviated by attempting four points of contact, rather than five. Prior to sending the first invitation message, a brief prenotice e-mail message was sent to the AAAE membership by the President of the AAAE via the AAAE electronic list-serve. The prenotice indicated the need to determine the profession's level of support for the *NRA* and noted the President's support for the study. Three personalized e-mail invitations followed the prenotice in approximately five-day intervals; each was written by a different researcher who was affiliated with a different research focus area so as to appeal to the various interest groups. E-mail invitations were sent using the Hosted Survey™ software to each of the AAAE members' e-mail addresses indicated on the on-line *Directory of the American Association for Agricultural Education.* Each e-mail invitation invited AAAE members to share their experiences and opinions about the AAAE and the *National Research Agenda*, and included a personalized link to the Web-based electronic questionnaire. As electronic questionnaires were completed the names of the individuals who had responded were removed from the correspondence list of AAAE members to avoid sending additional e-mail correspondence. A final response rate of 77.6% (n = 246) was obtained.

Non-response error was a relevant concern; therefore, procedures for handling nonrespondents were followed as outlined as *Method 1* in Lindner, Murphy, and Biers (2001). Respondents were dichotomously split into early and late respondent groups (Miller & Smith, 1983) to compare variables of interest: participative safety, support for innovation, vision, and task orientation. An independent samples t-test was used to compare the variables of interest and yielded no significant differences ($p > .05$) between early and late respondent data. Therefore, external validity did not threaten the generalizability of the findings of this study to the population (Lindner, et al.; Radhakrishna & Doamekpor, 2008).

Data Analysis

Data were analyzed using SPSS® version 17.0 for Windows™ platform computers. Research objective one sought to describe select professional characteristics of AAAE members. Therefore, frequencies and percentages for academic position, Research Priority Area focus, regional affiliation, AAAE membership status, and frequency of attendance at regional and national AAAE meetings were reported. Mean and standard deviation were reported for length of membership in AAAE, and length of employment at current institution. Research objective two sought to describe AAAE members' perceptions of the organizational climate of the AAAE. Subjects were asked to respond to 24 statements representing communication and innovation behaviors within the AAAE, and eight questions related to the task style of members of the AAAE, using a 5-point Likert-type scale to reflect levels of agreement. Mean, mode, and standard deviation were reported. Mode was included as a more conservative descriptor of central tendency. Research objective three sought to describe the level of the profession's support 2007-2010 version of the NRA. Subjects were asked to respond to 13 questions regarding the objectives of the AAAE and the NRA using a 5-point Likert-type scale to reflect levels of agreement. Mean, mode, and standard deviation were reported.

Findings

Research objective one sought to describe selected professional characteristics of AAAE members. Each subject was asked to describe his or her: academic position, research priority area focus, AAAE regional affiliation, and membership status, frequency of attendance at regional and national AAAE meetings. The results are summarized in Table 1. Length of membership in AAAE and length of employment at current institution are noted in Table 2.

Table 1
Professional Characteristics of AAAE Membership (n = 245)

Professional Characteristic	*f*	%
Academic Position		
Master's Graduate Student	3	1.2
Doctoral Graduate Student	36	14.7
Lecturer	10	4.1
Assistant Professor	57	23.3
Associate Professor	37	15.1
Professor	75	30.6
Professor Emeritus	4	1.6
Other	23	9.4
Research Priority Area focus[a]		
Agricultural Communications	28	7.6
Agricultural Leadership	39	10.6
Agricultural Education in Domestic and International Settings: Extension and Outreach	53	14.4
Agricultural Education in University and Postsecondary Settings	111	30.2
Agricultural Education in Schools	136	37.1
AAAE Regional affiliation		
North Central	78	31.8
Southern	110	44.9
Western	57	23.3
Attendance at regional AAAE meeting		
Every year	105	44.1
Most Years	64	26.9
Occasionally	50	21.0
Never	19	8.0
Attendance at national AAAE meeting		
Every year	87	36.6
Most Years	62	26.1
Occasionally	58	24.4
Never	31	13.0

Note: [a] data does not equal 100% because of members with multiple focus areas

Table 2
Professional Characteristics of AAAE Membership (n = 245)

Characteristic	*M*	*SD*
Length of membership in AAAE	11.38	10.05
Length of employment at current institution	9.29	9.16

Research objective two sought to describe members' perceptions of the AAAE organizational climate. Findings are presented by construct: participative safety (see Table 3), support for innovation (see Table 4), and task orientation (see Table 5). Items in each Tables 3 – 5 were ordered by mean score.

The overall construct mean for participative safety was 3.39 (*SD* = 0.64). One item related to participative safety had a mean score above four, indicating agreement with the statement: *we influence each other* (*M* = 4.02, *SD* = 1.73). The other 12 items related to participative safety has associated mean scores that ranged from 3.18 to 3.83 (see Table 3), indicating that members, on average, did not agree nor disagree with 12 of the 13 statements. However, based on mode, most respondents agreed with 12 of the 13 statements.

Table 3
Members' Perceptions of Items Related to Participative Safety (n = 245*)*

Item	*M*	Mode	*SD*
We influence each other.	4.02	4	0.73
We generally share information in the profession, rather than keeping it to ourselves.	3.83	4	0.85
We keep in regular contact with each other.	3.50	4	0.88
There are real attempts to share information throughout the AAAE.	3.49	4	0.95
We keep in touch with others in the association.	3.45	4	0.91
We have a 'we are in it together' attitude.	3.40	4	1.00
We interact frequently.	3.32	4	0.96
In the AAAE, people feel understood.	3.29	4	0.92
In the AAAE, people feel accepted.	3.29	4	1.06
Members of the AAAE meet frequently to talk *formally*.	3.28	4	0.99
People keep each other informed about work-related issues in the AAAE.	3.25	4	0.94
There is a lot of give-and-take.	3.22	3	0.94
Members of the AAAE meet frequently to talk *informally*.	3.18	4	1.03
Overall construct mean	3.39	–	0.64

Note: Scale: 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Agree; 5 = Strongly Agree

Support for innovation had an overall construct mean of 3.15 (*SD* = 0.77); therefore, the members, on average, had neutral beliefs regarding nearly all of the statements related to support for innovation (see Table 4). Furthermore, the average members disagreed with the statements *the AAAE is open to change* (*M* = 2.96, *SD* = 1.09) and *the AAAE is responsive to change* (*M* = 2.96, *SD* = 1.07). Whereas, based on mode, most AAAE members agreed with nine of the 11 statements; indicating neutral beliefs (Mode = 3) regarding *the AAAE is always moving toward the development of new answers* and *the AAAE is responsive to change*. Therefore, the beliefs of AAAE membership for three items vary depending on the basis for interpretation (*M* versus Mode): *in the AAAE, we take the time needed to develop new ideas* (*M* = 3.03, *SD* = 1.00, Mode = 4); *the AAAE is open to change* (*M* = 2.96, *SD* = 1.09, Mode = 4); and *the AAAE is responsive to change* (*M* = 2.96, *SD* = 1.07, Mode = 3).

Table 4
Members' Perceptions of Items Related to Support for Innovation (n = 245)

Item	*M*	Mode	*SD*
People in the AAAE cooperate in order to help develop new ideas.	3.49	4	0.90
Assistance in developing new ideas is readily available.	3.45	4	0.93
Members of the AAAE *share* resources to help apply new ideas.	3.34	4	0.95
AAAE members provide practical support for new ideas and their application.	3.20	4	0.94
Members of the AAAE *provide* resources to help apply new ideas.	3.19	4	0.96
People in the AAAE are always searching for new ways of looking at problems.	3.15	4	0.97
Everyone's view is listened to, even if it is in a minority.	3.09	4	1.01
The AAAE is always moving toward the development of new answers.	3.07	3	1.00
In the AAAE, we take the time needed to develop new ideas.	3.03	4	1.00
The AAAE is open to change.	2.96	4	1.09
The AAAE is responsive to change.	2.96	3	1.07
Overall construct mean	3.15	--	0.77

Note: Scale: 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree nor Disagree; 4 = Agree; 5 = Strongly Agree

The overall construct mean for task orientation was 3.05 (*SD* = 0.77). One-half of the eight items related to task orientation had mean scores that ranged from 3.16 to 3.42 (see Table 5), indicating that the average AAAE members agreed to some extent with those items. Levels of agreement varied with six items depending on the basis for interpretation –*M* versus Mode. Most AAAE members agreed that *there a real concern among AAAE members that the AAAE should achieve the highest standards of performance* (*M* = 3.42, *SD* = 0.98, Mode = 4) and their *AAAE colleagues provide practical help to enable [them] to do the job to the best of [their] ability* (*M* = 3.16, *SD* = 1.03, Mode = 4).

Table 5
Members' Perceptions of Items Related to Task Orientation (n = 245)

Item	*M*	Mode	*SD*
Is there a real concern among AAAE members that the AAAE should achieve the highest standards of performance?	3.42	4	0.98
Do your AAAE colleagues provide *useful ideas* to enable you to do the job to the best of your ability?	3.26	3	0.97
Do members of the AAAE build on each other's ideas in order to achieve the best possible outcome?	3.18	3	0.96
Do your AAAE colleagues provide *practical help* to enable you to do the job to the best of your ability?	3.16	4	1.03
Does the AAAE provide a clear criterion that members try to meet in order to achieve excellence as an association?	2.98	3	1.02
Are AAAE members prepared to question what the AAAE is doing?	2.95	3	1.08
Do you and your AAAE colleagues monitor each other so as to maintain a higher standard of work?	2.88	3	1.10
Does the AAAE critically appraise potential weaknesses in what it is doing in order to achieve the best possible outcome?	2.75	3	1.01
Overall construct mean	3.05	--	0.77

Note: Scale: 1 = To a very little extent ; 3 = To some extent; 5 = To a very great extent

Research objective three sought to describe the level of the membership's support of the 2007-2010 version of the NRA. The construct *vision* was used to assess the level of the profession's support 2007-2010 version of the NRA. Based on the overall construct mean of 3.41 (*SD* = 0.73), members were at least somewhat supportive of the NRA, but did not completely support the NRA (see Table 6). Most members were somewhat clear about the NRA, but not completely. Furthermore, most members believed the NRA was useful, appropriate, realistic, attainable, and achievable to some extent, but not completely. Moreover, most members believed the NRA was worthwhile for themselves, the AAAE, and wider society.

Table 6
Members' Support for the 2007-2010 Version of the National Research Agenda of the AAAE (n = 245)

Item	*M*	Mode	*SD*
How worthwhile do you think the *National Research Agenda* priorities are to the AAAE?	3.78	4	0.91
How clear are you about the *National Research Agenda Priorities*?	3.65	4	0.95
To what extent do you think the *National Research Agenda* priorities are useful priorities?	3.64	4	0.96
To what extent do you think the *National Research Agenda* priorities are appropriate priorities?	3.60	4	0.90
To what extent are you in agreement with the *National Research Agenda* priorities?	3.60	4	0.88
To what extent do you think the *National Research Agenda* priorities are realistic?	3.50	4	0.93
How worthwhile do you think the *National Research Agenda* priorities are to you?	3.49	4	1.06
To what extent do you think the *National Research Agenda* priorities can be attained?	3.42	4	0.92
To what extent do you think the *National Research Agenda* priorities can actually be achieved?	3.37	4	0.86
To what extent do you think other AAAE members agree with the *National Research Agenda* priorities?	3.37	3	0.76
How worthwhile do you think the *National Research Agenda* priorities are to the wider society?	3.24	4	1.08
To what extent do you think the *National Research Agenda* priorities are clearly understood by other members of the AAAE?	3.18	3	0.85
To what extent do you think members of the AAAE are committed to the *National Research Agenda* priorities?	3.08	3	0.85
Overall construct mean	3.41	--	0.73

Note: Scale: 1 = Not at all ; 3 = Somewhat; 5 = Completely

Conclusions, Implications, Recommendations

Research objective one sought to describe selected professional characteristics of AAAE members. The AAAE membership is balanced between organizational continuity, stability, and potential to change. One-half of the membership provides stability; holding positions as Associate Professor or Professor. Nearly one-third of the members are very experienced; holding Professor or Professor Emeritus titles and providing for organizational continuity. Nearly 25% of the organization's members provide potential for change, holding positions as Assistant Professors. Each of the research focus areas in the profession are well represented. Although the majority of members describe their research focus area as agricultural education in schools or university and postsecondary settings, all research areas had sufficient faculty participation to achieve a critical mass. The Southern region is the largest region, representing nearly one-half of the total membership, followed by North Central and Western regions. Both the regional and national meetings are relevant and important to the membership; with a full two-thirds of the members attending the regional meetings, and nearly two-thirds attending the national meeting, every year or most years.

Research objective two sought to describe members' perceptions of the AAAE organizational climate. Overall, AAAE members varied greatly when considering their responses to individual items related to participative safety, support for innovation, and task orientation. Members believed that they were influential toward each other, shared information, and frequently interacted. However, member's beliefs varied greatly regarding levels of acceptance and whether the AAAE had a 'we are in it together' attitude—indicators that individuals may be concerned that the AAAE is not a safe or supportive environment to express their ideas without risk of appearing foolish or facing ridicule (Anderson & West, 1996). If AAAE members want to provide opportunities for individual and organizational growth, development, and renewal, then they must create an environment where members are willing to try out new ideas without fear of feeling foolish.

On average, members do not believe that the AAAE is open or responsive to change. Members neither agree nor disagree that the AAAE is moving toward the development of new answers. Members further indicated mixed beliefs regarding the collective accountability for excellence in performance of shared outcomes within the AAAE. Members, on average, agreed that they are influence one another—the only item to achieve a mean value above 4.0 (Agree). One might question how members can influence one another, yet the AAAE is not open and responsive to change? Should AAAE members not hold themselves accountable for being closed-minded or resistant to change? Is it everyone else's problem? Could it be indicative of the culture within the AAAE? It is likely that members' definition of influence differs because members' responses to items in the task orientation construct do not necessarily support that concept. For example, items with the highest mean scores indicate that members believe that the AAAE, as an organization, should achieve the highest standards of performance, and that their colleagues provide useful ideas and practical help. Nonetheless, items with the lowest mean scores in the task orientation construct indicate that members do not perceive their AAAE colleagues to monitor one another, or critically appraise potential weaknesses to achieve the best possible outcome. Who should monitor standards and to what extent?

Research objective three sought to describe the level of the membership's support of the 2007-2010 version of the NRA. The NRA priorities are somewhat understood, useful, and worthwhile to a majority of the AAAE membership. The data suggest that members on average thought that others in the profession were less supportive than they were about the NRA priorities. How will this misperception, that others in the profession are less supportive of the priorities, impact the revision and/or adoption of the next version of the NRA?

Most members support the NRA; however, questions remain about the role of the NRA. Additional questions arise when considering the question *the AAAE provides a clear criterion that members try to meet in order to achieve excellence as an association*—the average members' agreement lies somewhere between very little and to some extent. Does that indicate that members do not associate the NRA as the benchmark criterion for the AAAE, or that they discount the efficacy of the document to guide the AAAE? Perhaps guidance, in addition to the NRA, is necessary to guide the AAAE in developing a reciprocal relationship of give-and-take among members.

The results of this study indicate that most AAAE members agreed to some extent with the priorities established in the 2007 – 2010 NRA, and found them somewhat useful and appropriate. To a lesser extent, they believed the research priorities could be attained. The authors believe that this is due in part to a lack of communication, and recommend that the AAAE systematically collect and report progress on each of the research priority areas.

It is important that more inclusive and participative methods be employed in the current effort to amend and adjust the NRA priorities, and that the outcome of the second initiative be evaluated in a more timely fashion to prevent misperceptions from developing within the AAAE. Further research is necessary to determine whether members support the NRA in its entirety or only portions of the document. It is recommended that the second initiative, currently underway, include efforts to ascertain and communicate the purposes of the Research Agenda in the AAAE.

The climate of an organization can be relatively easy to change, but change in culture takes the full commitment of every leader within the organization for a sustained period of time (Hofstede, 1997). Therefore, based on the organizational climate of the AAAE, the leadership of the AAAE should develop a long-term written plan to improve the functionality of the AAAE and to serve as a guide in the future development of the organization—a plan that goes beyond conducting research and the NRA (e.g. development of new answers, disseminating agricultural education research to practitioners, professional development goals, etc.). Development of such a plan should include member input, to critically appraise and address potential weaknesses of the AAAE, and to achieve the best possible outcome. Lastly, it is suggested that the modified version of the TCI used in this study, should be used to measure change in the organizational climate of the AAAE over time, to provide the AAAE leadership with information that may better allow them to improve the functionality of the organization.

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Adults' Level of Instructional Efficacy and Demographic Characteristics as Volunteer Educators in the UF IFAS/Extension Master Gardener Program

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Abstract
With increased budget cuts and a shortage of funding sources, Cooperative Extension needs a consistent corps of effective volunteers to deliver organizational objectives. Developing an understanding of volunteer motivations will assist Extension agents in identifying and retaining those adults. The theoretical framework of this study was based on self-efficacy theory. The purpose of this study was to develop an understanding of the teaching self-efficacy of Florida Master Gardeners. The questionnaire included the instructional efficacy construct from the Teacher Sense of Efficacy Scale (TSES) and questions about participant demographics. The sampled population was 613 adult Master Gardeners with a total response rate of 86%. The majority of participants were mainly women, white, earned some type of higher education degree, and 56 years old or older. Participants felt at least "some influence" in their effective teaching responsibility as a volunteer educator. Retaining adults as volunteer educators in the Master Gardener program extends the reach of Cooperative Extension throughout Florida's communities.

Introduction

The duties of the Cooperative Extension volunteer have become increasingly more significant in order for the organization to provide reliable services to clientele as Extension programs have continued to face budget deficits and decreased funding (Steele, 1994). The former Director of UF/IFAS Extension said the total value of Florida Master Gardener (MG) volunteer hours in 2007 were worth approximately $8,000,000 (L. Arrington, personal communication, June 1, 2008). Reiners, Nichnadowicz, Nitzsche, and Bachelder (1991) said the mission of the MG program is to educate participants as volunteer educators of the Cooperative Extension to provide homeowners with researched-based knowledge related to gardening. Cooperative Extension should use trained MGs in countless volunteer opportunities in order to obtain a good return on their investment (Meyer, 1997; Swackhamer & Kiernan, 2005).

In Florida, there are approximately 3,822 active adult MGs that serve 58 of the state's 67 counties. MGs complete a thirteen week course on topics such as plant diseases, soil fertility, entomology, etc. Adults are required to donate 75 volunteer hours annually to remain certified as a Florida MG once their education is finished. MGs responsibilities are to teach horticultural demonstrations to homeowners in communities, and provide consultations to clientele via face-to-face interaction and the telephone at the local extension office.

The National Research Agenda calls for research to "identify the competencies needed by agricultural extension practitioners" (Osborne, n.d., p. 14). Research is needed on MGs' instructional efficacy due to the valuable resource adults provide the land-grant university as volunteer educators. MGs are volunteer educators teaching homeowners on recommended horticultural practices and subject matter provided by the land-grant university's research arm. Training volunteers correctly, and providing enjoyable experiences for volunteers, may encourage individuals to continue their volunteer service (Corporation for National and Community Service, 2006).

Adults participating in educational programs can have diverse demographic characteristics. Researchers should develop an understanding of MG characteristics as volunteers on a state by state basis due to the lack of a standard national program (Kirsch & VanDerZanden, 2002). Previous research has identified MGs as typically older white women (Meyer, 2004; Rohs, Stribling, & Westerfield, 2002; Sutton, 2006). However, little research exists as to MGs' level of education, income, or length of tenure in the program.

National statistics have revealed that, on the average, one out of three volunteers cease volunteering after one year of service (Corporation for National and Community Service, 2006). A continuous stream of volunteers is essential to the operation of Extension objectives (Smith, 2005). Stouse and Marr (1992) suggested that volunteer MGs serve as walking advertisements for Cooperative Extension. An importance exists to prepare adults appropriately in order to serve as effective volunteer educators in MG.

Theoretical Framework

Bandura's (1993) self-efficacy theory was the theoretical framework of this study. The self-efficacy theory describes how people perform skills and react to events is influenced by their feelings of self-efficacy (Bandura, 1993). Bandura (1997) said the affect of self-efficacy plays a role in an adult's motivation to participate in an activity. Self-efficacy will influence how adults think, form attitudes, motivate themselves, and function (Bandura, 1997). Educator self-efficacy explains an instructor's confidence in his/her aptitude to produce learner engagement and learning outcomes (Tschannen-Moran & Woolfolk Hoy, 2001).

Adults confident in their abilities address complex undertakings as opportunities to be successful (Bandura, 1997). Success encourages their interest in a subject and engages individuals in endeavors. High self-efficacy adults establish lofty goals and sustain a robust obligation to those goals. Also, these individuals devote enhanced efforts in their duties and improve their efforts in the appearance of letdowns. High self-efficacy individuals consider advantages by continuing to be task oriented in times of trials and accredit letdowns to inadequate efforts. High self-efficacy individuals are success oriented and thus promptly recuperate their feelings of efficacy after letdowns (Bandura, 1993). These individuals address perils believing they can manage them. These attributes of self-efficacy operationally contribute to individual accomplishments.

Adults with low teaching efficacy are more likely to give-up in the face of trials. Educators possessing low teaching efficacy may remain involved but avoid responsibilities in which individuals feel least efficacious. Low teaching efficacy educators produce inferior learning outcomes from participants than high teaching efficacy educators (Tschannen-Moran & Woolfolk Hoy, 2001).

Knobloch and Whittington (2002) found collective efficacy was theoretically and operationally similar to teacher efficacy. Teaching in a setting similar to what students would encounter professionally improved their teaching efficacy (Knobloch, 2001). Self-efficacy was the influential variable that characterized individuals who succeeded as secondary agricultural education teachers (Kelsey, 2007). Student teachers felt more efficacious about their teaching after student teaching (Knoblach, 2002; Roberts, Harlin, & Ricketts, 2006; Stripling, Ricketts, Roberts, & Harlin, 2008).

Master Gardeners utilize their knowledge and skills to teach clientele (Peronto & Murphy, 2009; Rohs & Westerfield, 1996). If preservice teachers are better educators after their teaching efficacy is improved, then Master Gardeners may remain active and be more proficient and effective in their roles as volunteer educators if they possess high self-efficacy in teaching.

Summary of Purpose and Objectives

The purpose of this study was to develop an understanding of adult participation in the Florida Master Gardener program. The primary objectives of the study were to:

1. Describe participant demographics in the Florida Master Gardener program.

2. Describe Master Gardeners' efficacy in instructional strategies as volunteer educators.

Methodology

The findings are part of a larger quantitative study conducted to develop an understanding of factors related to the enrollment and retention of Florida Master Gardeners. The research design was survey research. Stratified sampling was used to select the population of participants from the Florida Master Gardener program. The portion of the study reported here focused on the teaching self-efficacy and demographics of Master Gardeners.

Approximately 3,822 adult Floridians participate in the Master Gardener program (E. Eubanks, personal communication, March 8, 2009). According to Cochran (1977), a sample size of 362 usable surveys was required for a confidence interval of +/- 5 when $N = 3,822$. Response rates reported in recent literature are utilized to determine the potential response rate for future research involving a mail survey with a similar population (Bartlett, Kotrlik, & Higgins, 2001). For mail surveys, 5 to 10 % should be added to the total sample size in order to account for incorrect participant mailing addresses, participants who may have recently passed away, and for questionnaires with incomplete participant responses (Babbie, 1990; Salkind, 1997).The response rate was anticipated to be between 62 and 68% due to response rates in previous research utilizing a mail survey with Master Gardeners (Rexroad, 2003; Schott, 2001; Schrock, 1999; Sutton, 2006).The sample size was 613 Master Gardener participants (362 usable surveys ÷ 65% average response rate × 10% = a sample size of 613).

Survey research employs questionnaires to gather data from the population. Ary, Jacobs, Razavieh, and Sorenson (2006) explained survey research allows the researcher to condense the results of characteristics of dissimilar groups in order to assess their attitudes and opinions. The questionnaire included the instructional efficacy construct from Tschannen-Moran and Woolfolk Hoy's (2001) Teacher Sense of Efficacy Scale (TSES) and questions about participant demographics. The researcher's pilot tested the TSES on a group of MGs in a county program in Tennessee. Content validity was addressed by a team of researchers and MG coordinators at the University of Florida. The TSES was derived from Bandura's (1993) self-efficacy theory. On the instructional efficacy construct of the TSES, respondents were asked "How much can you do?"

with a scale of: 9 = *a great deal*, 7 = *quite a bit*, 5 = *some influence*, 3 = *very little*, and 1 = *nothing*. Reliability for the instructional efficacy construct of the Teacher Sense of Efficacy Scale was calculated ex post facto at .93.

The researchers utilized the methods outlined by Dillman, Smyth, and Christian (2009) to increase response rate from participants when instituting a mail questionnaire. The data collection instrument was printed in a booklet layout and then mailed to the sampled population. Six hundred thirteen participants were surveyed and 532 participants returned their completed surveys to the researchers. Thus, the response rate was 86.78%. Two respondent surveys were pulled from the study due to incomplete information. Early and late respondents were compared and no significant differences existed, therefore the results may be generalized to adult Master Gardeners in Florida (Lindner, Murphy, & Briers, 2001).

Descriptive statistics were selected to analyze the study's objectives. Descriptive statistics determine attributes of different groups in order to measure their attitudes toward a specific item (Shavelson, 1996). A limitation of the study is the selection of Master Gardener adult participants in Florida. The target population may not be characteristic of other Master Gardener programs in other states.

Findings

The first objective of the study was to describe participant demographics in the UF/IFAS Extension Master Gardener Program. As reported in Table 1, most of the respondents were women. Women accounted for 73.01% (n = 387) of the responses. Males accounted for 26.90% (n = 143) of the responses. Most respondents were white. Whites accounted for 92.07% (n = 488) of the responses. Hispanics accounted for 2.26% (n = 12), African Americans accounted for 1.69 % (n = 9), Asians accounted for 1.50% (n = 8), "Other" accounted for 1.32% (n = 7), and Native Americans accounted for .75% (n = 4).

The majority of respondents (79.43%, n = 421) were 56 years old or older. Very few respondents were between 18 and 45 years old. The 18 – 45 years old individuals accounted for 3.77% (n = 20) of the responses. Adults 46 – 55 years old accounted for 16.41% (n = 87) of the responses. A large percentage of respondents had obtained some form of higher education. Seventy-nine percent (n = 415) of respondents had earned at least an Associate's Degree. Adults with a high diploma or equivalent accounted for 21.32% (n = 113) of the responses.

As reported in Table 1, most respondents earned between \$24,999 and \$99,999 annually. Adults indicating their annual income was between \$24,999 and \$99,999 annually accounted for 61.32% (n = 325) of the responses. Respondents earning \$24,999 or less accounted for 13.39% (n = 71) of the responses. Respondents earning \$100,000 or more annually accounted for 13.58% (n = 72) of the responses. A large portion of respondents had been Master Gardeners between 2 and 10 years 86.22% (n = 457) of the responses. Respondents who had been Master Gardeners over one year accounted for 19.43% (n = 103). Fourteen percent of respondents (n = 73) had been involved in the program for 11 or more years.

Table 1
Florida Master Gardener Participant Demographics

Characteristic	*f*	%
Gender		
Female	387	73.01
Male	143	26.98
Ethnicity		
African American	9	2
Asian	8	2
Hispanic	12	2
Native American	4	1
Pacific Islander	0	0
White	488	92
Other	7	1
Age		
18 – 34 years old	7	1
35 – 45 years old	13	3
46 – 55 years old	87	17
56 – 65 years old	186	35
66 years or older	235	45
Education		
High School Diploma or Equivalent	113	21
Associate's Degree	96	18
Bachelor's Degree	162	31
Master's Degree	111	21
Doctoral Degree	15	3
Professional Degree	31	6
Income		
$24,999 or less	71	15
$25,000 to $49,999	142	30
$50,000 to $74,999	117	25
$75,000 to $99,000	66	14
$100,000 or more	72	15
Tenure in Master Gardener		
More than One Year	103	19
2 – 4 years	162	31
5 – 10 years	192	36
11 or more years	73	14
Lived in Florida		
10 years or less	128	24
11 – 20 years	102	19
21 – 30 years	98	18
31 years and over	202	39
Born in Florida		
Yes	65	12.26
No	463	88.74

The vast majority (75.84%, n = 402) of the respondents had lived in Florida for at least eleven years. Of those respondents, nearly 40% had lived in Florida for 31 years or more. Despite these numbers, few (12.26%, n = 65) respondents were native Floridians. Eighty-eight percent of respondents (n = 463) were not born in Florida.

The second objective of the study was to describe Master Gardeners' efficacy in instructional strategies as volunteer educators. The overall mean for the construct was 6.27 (SD = 1.53). Table 2 illustrates the descriptive statistics for the instructional efficacy construct. Responses ranged from quite a bit (M = 6.66, SD = 1.72) to some influence (M = 5.80, SD = 2.10). The highest means occurred for the questions "How well can you respond to difficult questions from your clients? (M = 6.66, SD = 1.72) and "To what extent can you craft good questions for your clients?"(M = 6.58, SD = 1.79). The lowest mean was associated with the question "How much can you gauge client comprehension of what you have taught?" (M =5.80, SD = 2.10).

Table 2
Descriptive Statistics for the Instructional Efficacy Construct

	N	*M*	*SD*
How well can you respond to difficult questions from your clients?	530	6.66	1.72
To what extent can you craft good questions for your clients?	530	6.58	1.79
How much can you gauge client comprehension of what you have taught?	528	6.28	1.87
To what extent can you provide an alternative explanation or example when clients are confused?	530	6.24	1.80
How much can you do to adjust your information to the proper level for individual clients?	530	6.21	1.74
How well can you implement alternative strategies in your teaching?	530	6.11	1.74
How comfortable are you using evaluation strategies?	530	5.80	2.10

Note: Overall M = 6.27*,* SD = 1.53. Scale: 9 = *a great deal*, 7 = *quite a bit*, 5 = *some influence*, 3 = *very little*, 1 = *nothing.*

Conclusions

The first objective was to describe participant demographics in the Florida MG program. Respondents in this study were homogenous (older, white, women, educated and well-off). MGs are a population that has been determined to be homogenous in other studies (Rohs, Stribilng, & Westerfield, 2002; Rouse & Clawson, 1992; Ruppert et al., 1997; Waliczek, Zajicek & Lineberger, 2005). The guidelines required to participate in Florida MG may align with the homogenous adult demographic characteristics identified from this study.

The study's second objective was to describe MGs' efficacy in instructional strategies as volunteer educators. Respondents' answers to each of the TSES questions indicated Florida MGs possessed "some influence" to "quite a bit" of instructional efficacy. Florida MGs were not possessing appropriate levels of self-efficacy in instructional strategies.

Implications

Bandura (1993) said self-efficacy was the extent adults perceive their ability to manage activities that impact their lives. Respondents' level of instructional efficacy indicated adults felt comfortable in their role as volunteer educators. An adult who has efficacy with his/her volunteer duties is more likely to continue his/her participation in the MG Program. This is important for MG participation due to Cooperative Extension's need for volunteers and specifically those that can serve as effective volunteer educators for their local MG Program. MGs possessing high self-efficacy are more likely to provide high quality learning experiences for clientele. Teaching efficacy influences educator retention and learning outcomes of participants (Tschannen-Moran & Woolfolk Hoy, 2001).

MGs had lower efficacy in evaluation strategies than any other instructional efficacy category. Bandura (1997) reported adults that have lower self-efficacy in specific duties are less likely to participate in activities that require attributes involving those same duties. This could be due to their MG coordinator having low efficacy in evaluation strategies themselves, and this translates to adult participants being less comfortable in conducting evaluations. This could lead respondents to avoid conducting evaluations with their clients. This study found respondents' instructional efficacy was slightly above average in evaluation strategies and thus it is unlikely they would have a vigorous commitment to those objectives (Tschannen-Moran & Woolfolk Hoy, 2001).

The goals of the MG Program are to enable adult volunteers to assist Cooperative Extension in teaching research-based horticultural information to local constituents (Relf & McDaniel, 1994). Participants in this study had average instructional efficacy. Individuals with average instructional efficacy may terminate MG participation resulting in Florida Cooperative Extension losing valuable volunteer educator time. Cooperative Extension should be concerned if MGs have average or low self-efficacy due to the likelihood adults will discontinue their participation (Tschannen-Moran & Woolfolk Hoy, 2001).

Recommendations

Since the demographic characteristics of Florida MGs have been identified, Florida MG coordinators should take those characteristics into consideration when promoting the program with the purpose of including more participants. The awareness of MG characteristics should assist MG coordinators with better understanding their current and potential audience.

If the Florida MG program seeks to include participants with more demographic diversity, then steps will need to be incorporated to promote the inclusion of adults with characteristics dissimilar than those that emerged from this study. Specific demographic data for each Florida County should be considered when the local MG coordinator promotes and plans their program. The time necessary to be a MG may not be available to all adults. Nonetheless, attempts to market MG to a broader audience should be researched in order for Cooperative Extension to broaden its fleet of volunteer educators (Relf & McDaniel, 1994) and clientele (Peronto & Murphy, 2009). UF IFAS/Extension should strive to identify, recruit, and train a more ethnically diverse group of adults as volunteer educators for MG.

MGs felt the least efficacious in their ability to utilize evaluation strategies. The instructional efficacy of MG coordinators should be assessed to develop an understanding of the educational training needs for those extension personnel. The study's findings suggest MGs should have a professional development plan constructed for them.

A significant aspect of the plan should include methods to enhance instructional efficacy. This would address cultivating cognitive efficacy in MGs. Cognitive efficacy is the extent individuals construct goals according to a personal assessment of their aptitude (Bandura, 1997). A MG professional development plan should be researched in order to determine participants' level of instructional efficacy before the professional development experience, during the middle of their involvement in the program, and their level of instructional efficacy after their participation has concluded. This aspect would inform researchers and practitioners if the professional development plan improved MGs' instructional efficacy. If not, the professional development plan should be altered in order to make sure volunteer educators are properly trained and prepared to educate Florida's citizens.

The inclusion of more quality volunteer educators in the MG program would be a benefit to UF IFAS/Extension. The instructional efficacy findings from this study indicate reasons why adults may choose to terminate their involvement in the MG program. If participants have moderate or low instructional efficacy, the likelihood that adults will end MG involvement in increased (Tschannen-Moran & Woolfolk Hoy, 2001). Data on the instructional efficacy construct should assist local and state coordinators in understanding what does and does not cause adult retention in the MG program (Flagler, 1992). When educators possess high instructional efficacy, they are more likely to remain in their teaching role (Tschannen-Moran & Woolfolk Hoy). Steps should be taken to enhance MGs' instructional efficacy in order for UF IFAS/Extension to get the most "bang for their buck" (Meyer, 1997; Swackhamer & Kiernan, 2005) from these volunteer educators, and to ensure that adults continue their participation in this program.

MGs should be provided experiences to practice teaching with clientele. It is possible that MGs will perceive instructional efficacy higher at the conclusion of those instructional opportunities than initial perceptions prior to teaching. Agricultural teachers have indicated an increase in perceived instructional efficacy after the student teaching experience (Roberts et al., 2006; Stripling et al., 2008). This method of practice teaching is yet another approach to enhance MG instructional efficacy.

Possessing knowledge and capabilities does not translate into an individual capable of utilizing them (Bandura, 1993). MG coordinators and high instructional efficacy MGs should construct open and comfortable learning environments for 'new' MGs, and current participants possessing low instructional efficacy. Learning environments play a significant role in the attainment of individual efficacy (Bandura, 1997). The importance of including these types of learning environments in order to improve instructional efficacy should not be underestimated. Bandura (1993) said learning environments that interpret aptitude as a learnable skill, pay less attention to social comparison competitions, and underscore personal comparisons of development and achievements are a best fit for constructing an efficacy setting that encourages enhanced learning. MG coordinators, local officer councils and participants with high instructional efficacy should work together to ensure learning environments are cultivating enhanced instructional efficacy for current and potential MGs. This approach may assist in retaining MGs who serve as advertisements for Cooperative Extension (Stouse & Marr, 1992), and improving current participants' instructional efficacy which should allow Cooperative Extension is to achieve organizational objectives (Smith, 2005).

The inclusion of a formal mentoring program is recommended as well. More seasoned MGs identified to have high instructional efficacy should be utilized to mentor less seasoned participants in instructional methods. This mentoring system should be researched to identify participants' level of instructional efficacy at the beginning, middle, and the conclusion of the mentoring process. This information would assist researchers, and state and local program planners in learning the value of this type of professional development, and changes could be made to enhance the program accordingly. A robust sense of efficacy causes individuals to set enhanced objectives after their initial objective is accomplished (Bandura, 1997). This experience could enhance the motivational efficacy of MGs with high instructional efficacy by providing another objective to their role as volunteer educators for the program. Implementing additional challenges constructs new motivating differences for individuals to achieve (Bandura, 1993). This facet would provide another method in improving current and future Florida MGs' instructional efficacy.

The study's findings in instructional efficacy indicates a need for a formal statewide mentoring program for MG. Adults new to the MG should be assigned to a mentor who has been identified by the local MG coordinator to possess high instructional efficacy. MG coordinators should utilize participants' instructional efficacy as a motivation (Bandura, 1997) to provide them more opportunities to teach and prepare MGs who are less efficacious with instructional strategies. Brudney (1999) recommended educational programs relying on volunteers in the public sector should utilize adults that have efficacy in their roles in order for the organization to be the most effective. This would address Bandura's (1997) recommendations of methods to improve efficacy in others. The new participant could accompany the seasoned MG when planning an educational program, when they teach clientele out in the community, and in the Extension office answering client questions via the telephone or webpage. This would assist the new members in actively learning the techniques in a realistic setting. Again, the instructional efficacy of the new MGs should be measured at the beginning, middle and the conclusion of the mentoring experience.

The findings address the National Research Agenda's call to identify competencies needed by agricultural extension stakeholders (Osborne, n. d.). This study indicated Florida MGs need their own formal professional development experiences provided by the local MG coordinator, and overseen by the state coordinator. This type of program plan should include objectives that are specific and relevant, and an ongoing evaluation component to ascertain if participants are demonstrating higher efficacy in instructional strategies. This need exists due to the time and clientele contacts that MGs provide UF IFAS/Extension as volunteer educators.

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The Relationship between Verbal Immediacy, Nonverbal Immediacy, Self-efficacy, and Task Value

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Abstract

This descriptive correlation study sought to examine the relationship between verbal immediacy, nonverbal immediacy, self-efficacy, and task value. Respondents assessed the verbal and nonverbal immediacy of their course instructor, and then assessed their personal self-efficacy and task value motivation. Results showed a significant positive relationship between verbal immediacy and self-efficacy (r = .334), nonverbal immediacy and self-efficacy (r = .209), verbal immediacy and task value (r = .234), and nonverbal immediacy and task value (r = .152). Based on the list of effect size descriptors for the magnitude of a correlation, developed by Cohen (1988), the effect sizes between self-efficacy and verbal immediacy were considered medium. The effect sizes between nonverbal immediacy and self-efficacy, and between verbal immediacy, nonverbal immediacy, and task value were considered small. Results indicated 11% of the variance in self-efficacy was explained by the verbal immediacy of teachers, and four percent of the variance in self-efficacy was explained by nonverbal immediacy. Specific to task value, six percent of the variance was explained by verbal immediacy and two percent by nonverbal immediacy. Results are discussed in light of the theoretical underpinnings and recommendations made for continued research.

Introduction

Stefanou, Perencevich, DiCinto, and Turner (2004) stated that, "There is a recognized need for studies that provide rich details from the classroom to help expand our understanding of the relationships between student motivation, how such motivation is expressed, and instructional practices" (p. 98). The theory of immediacy considers and identifies verbal and nonverbal communication messages, yet is rarely connected with specific measurements of student motivation. The need exists to identify whether or not teacher immediacy is associated with corresponding self-efficacy and task value student motivation. Wentzel and Wigfield (1998) stated that, "Researchers need to explore further how different classroom and interpersonal contexts influence students' academic and social motivation" (p. 170). Based on the expressed need of previous researchers (Stefanou, et al.; Wentzel & Wigfield), the purpose of this study was to examine the relationship between immediacy behaviors and student self-efficacy and task value motivation.

A review of the motivation and immediacy research in agricultural education revealed the need for further inquiry. Agricultural educators have examined self-efficacy of preservice teachers (Knobloch & Whittington, 2003a; Roberts, Harlin, & Ricketts, 2006; Roberts, Mowen, Edgar, Harlin, & Briers, 2007; Wolf, Foster, & Birkenholz, 2008) and the self-efficacy of current high school agriculture instructors (Blackburn & Robinson, 2008; Knobloch & Whittington, 2003b; Wolf, 2008), yet the researchers found only one agricultural education study which examined the relationship between instructor immediacy and student motivation (Velez & Cano, 2008).

An examination of the relationship between instructor immediacy (verbal and nonverbal) and student motivation directly addresses two of the National Research Agenda for Agricultural Education and Communication, agricultural education in university and postsecondary settings, research priority areas. Research priority area two encouraged researchers to examine ways to improve the success of students enrolled in agricultural and life sciences academic and technical programs (Osborne, 2007). An examination of student motivation is a foundational area of focus to improving student success. Hofer (2006) stated that, "Knowing more about how students are motivated and what you can do to structure a class that positively affects student motivation can make a significant difference in student engagement and learning"(pp. 140-141). The National Research Agenda for Agricultural Education and Communications also encourages research with the potential to enhance the effectiveness of agricultural and life sciences faculty (Osborne). An examination of the relationship between instructor behaviors (immediacy) and student motivation may yield results which can be used to improve the effectiveness of agricultural and life sciences faculty.

Theoretical Foundation

The theoretical foundation for this research was grounded in the Implicit Communication Theory espoused by Albert Mehrabian, and the Social Cognitive Theory developed by Albert Bandura. According to the Implicit Communication Theory, messages are constantly transmitted via a measure of verbal and non-verbal communication known as immediacy. Developed by Albert Mehrabian in 1969, immediacy is defined as those communication behaviors that "enhance closeness to and nonverbal interaction with another" (p. 203). The Implicit Communication Theory and the underlying theory of Immediacy, provide a basis to identify and attempt to measure low inference teaching behaviors.

Albert Mehrabian is credited as the originator of the Implicit Communication Theory (1981). Mehrabian began his theory by postulating that ". . . people rarely transmit implicitly the kinds of complex information that they can convey with words; rather, implicit communication deals primarily with the transmission of information about feelings and like-dislike or attitudes" (Mehrabian, 1981, p. 3). Thus, Implicit Communication Theory deals with a wide variety of the symbols and the "decoding" process utilized by the observer to form emotional states, attitudes, likes-dislikes, and preferences.

Based on the Implicit Communication Theory, Mehrabian developed the concept of verbal and nonverbal immediacy. Verbal immediacy refers to the verbal expressions used by teachers to develop within students a degree of like or dislike toward the teacher (Mehrabian, 1981). Examples of verbal immediacy would include ownership statements (my/our class), inclusive references (we vs. I) and probability (will v. may) statements (Rubin, Palmgreen, & Sypher, 1994). Nonverbal immediacy refers to the ability of the instructors to convey affective feelings of warmth, closeness, and belonging (Richmond, Gorham, & McCroskey, 1987). In

1981, Mehrabian further described nonverbal immediacy and stated that,

> People rarely transmit implicitly [nonverbally] the kinds of complex information that they can convey with words; rather, implicit communication deals primarily with the transmission of information about feelings and like-dislike or attitudes. The referents of implicit behaviors, in other words, are emotions and attitudes or like-dislike. (p. 3)

The Social Cognitive Theory, espoused by Bandura (1986), offers a way to explain human functioning, ". . . in terms of a model of triadic reciprocality in which behavior, cognitive and other personal factors, and environmental events all operate as interacting determinants of each other" (p. 18). In an effort to lend credence to the concept of triadic reciprocality, Bandura listed five basic human capabilities: 1) symbolizing, 2) forethought, 3) vicarious observation, 4) self-regulation, and 5) self-reflection, which he believed were essential human traits. Identification of the five basic human capabilities necessitated within Bandura the need to develop a comprehensive theory capable of addressing the complexities of human nature. Thus, the Social Cognitive Theory of human development was born.

Bandura grounded the Social Cognitive Theory of human development on the concept of triadic reciprocal determinism. According to Pajares (2002), reciprocal determinism is the view that, ". . . (a) personal factors in the form of cognition, affect, and biological events, (b) behavior, and (c) environmental influences create interactions that result in a *triadic reciprocality* " (p. 1).

Bandura used the term reciprocality to describe the unique interdependent nature of the three determinants. All determinants can, and to some extent do, exert a multiplicity of influences on each other. In addition, Bandura (1986) stated that "the relative influence exerted by the three sets of interacting factors will vary for different activities, different individuals, and different circumstances" (p. 24). The practical benefit of Bandura's reciprocal determinism allows counselors and therapists to direct efforts at either personal, behavioral, or environmental factors (Pajares, 2002). The unique acknowledgment of three important and interactive determinants evidenced a substantial philosophical break from the previous psychology which emphasized psychodynamic, trait, and behaviorist theories. Pajares (2002) summarized aspects of the social cognitive theory and stated that:

> In general, Bandura's social cognitive theory provides a view of human behavior and motivation in which the beliefs that people have about themselves are key elements in the exercise of control and personal agency and in which individuals are viewed both as products and as producers of their own environments and of their social systems. (p. 8)

Once Bandura identified individuals as having and exercising control over their thoughts, feelings, and actions, he began developing a theory to address people's beliefs in their own ability to succeed in a task. Bandura conceptualized his ideas as the Theory of Self-Efficacy (Bandura, 1986).

The concept of self-efficacy was defined by Bandura (1986) as, ". . . people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances. It [self-efficacy] is concerned not with the skills one has but with judgments of what one can do with whatever skills one possesses" (p. 391). Self-efficacy forms the practical and useful basis for the social cognitive theory by emphasizing the interactive nature of human agency. Bandura (1997) stated:

> Self-efficacy theory provides explicit guidelines on how to enable people to exercise influence over how they live their lives. A theory that can be readily used to enhance human efficacy has much greater social utility than theories that provide correlates of perceived control but have little to say about how to foster desired changes. (p. 10)

The third theoretical foundation, for this research was grounded on the Theory of Expectancy-Value. While the Theory of Expectancy-Value has had numerous authors, the researchers chose to focus on the Eccles et al. (1983) model of expectancy-value. The Eccles et al. model focused more on the academic implications of expectancy-value and emphasized two important predictors of academic behavior: expectancies for success and the subjective task value associated with the task (Schunk, Pintrich, & Meece, 2008). The purpose of the current research study was to focus on the aspect of task value. Eccles (2005) defined task value as, ". . . a quality of the task that contributes to the increasing or decreasing probability that an individual will select it" (p. 109). According to Eccles (2005), and Wigfield and Eccles (2002), subjective task value can be further subdivided into four components: attainment value, intrinsic or interest value, utility value, and cost value.

Conceptual Framework

Review of existing research related to verbal immediacy, nonverbal immediacy, self-efficacy, and task value points to both the importance and need for further research. Verbal immediacy has demonstrated an association with effective teaching, student motivation, affective learning, and perceived cognition (Christophel, 1990; Gorham, 1988). A myriad of other research studies have documented that the verbal immediacy of instructors increased the student cognitive, affective, and behavioral learning (Christophel, 1990; Gorham, 1988; Gorham & Christophel, 1990; Plax, Kearney, McCroskey, & Richmond, 1986).

Nonverbal immediacy has been linked to student motivation; however, the preponderance of studies analyzing the relationships between nonverbal immediacy and student motivation utilized a general measure of trait and state motivation. Christophel (1990) stated that nonverbal immediacy appeared to directly influence student perceptions of the instructor and tendency to enroll again, as well as student state and trait motivation. Frymier and Houser (2000) discovered correlations of 0.38 between teacher nonverbal immediacy and state motivation, and correlations of 0.45 between verbal immediacy and state motivation. Richmond (1990) documented a 0.38 correlation between the combined constructs of verbal and nonverbal immediacy and student motivation.

It is important to recognize that, in the previously mentioned studies (Christophel, 1990; Frymier & Houser, 2000; Richmond, 1990) trait and state motivation are very broad, non-specific measures which may lack the ability to discriminate between the various types of motivation. One study, specific to agricultural education, did examine verbal and nonverbal immediacy in relation to approach-avoidance and expectancy-value motivation (Velez & Cano, 2008). Results indicated a moderate relationship between expectancy-value and nonverbal immediacy and a low association between verbal immediacy and expectancy-value.

In regards to motivational constructs, self-efficacy and task value represent two important aspects of motivation. Self-efficacy has been linked to many educational benefits for students including gains in student persistence and skill acquisition (Schunk, 1991), increases in academic performance and persistence (Multon, Brown, & Lent, 1991) and gains in student achievement and effort (Bandura, 1997; Zimmerman, 2000). Multon, Brown and Lent (1991) examined 39 different self-efficacy studies and concluded that, " . . . across various types of student samples, designs, and criterion measures, self-efficacy beliefs account for approximately 14% of the variance in students' academic performance and approximately 12% of the variance in their academic persistence" (p. 34).

Task value is related to, yet distinct, from self-efficacy in that students may feel able to complete a specific task (efficacy) yet may not complete the task because they have no reason or incentive to do so (task value) (Wentzel & Wigfield, 1998). Task value provides the impetus, and is the catalyst for attempting a task. Eccles et al. (1983) discovered that the task value beliefs of students predicted both intention and actual decisions to continue in a particular course of study, and Pintrich (1994) identified task value as a motivational construct highly sensitive to particular tasks and context.

The paucity of research examining specific motivational constructs, and the research support for the benefits of immediacy, self-efficacy, and task value, establish a need for further research. Allen, Witt, and Wheeless (2006) conducted a meta-analysis examining teacher immediacy as a motivational factor in student learning and concluded that, "The research outcome in this report continues to justify attention to teacher immediacy as an aspect of classroom behavior that can improve learning outcomes by increasing student motivation" (p. 28).

Purpose

The purpose of this descriptive correlation study was to describe the relationship between verbal immediacy, nonverbal immediacy, self-efficacy, and task value. This study was guided by the following research questions.

RQ 1: What is the relationship between instructor verbal and nonverbal immediacy and student self-efficacy?
RQ 2: What is the relationship between instructor verbal and nonverbal immediacy and student task value?

Methods

Population and Sample

The target population for this descriptive-correlational study consisted of college students enrolled in two selected courses within the College of Food, Agriculture and Environmental Sciences at the Ohio State University. A purposive sample was selected and assessed from two of the largest non-major specific courses offered by the college. According to Ary, Jacobs, Razavieh, and Sorensen (2006), a purposive sample is one in which, ". . . sample elements judged to be typical, or representative, are chosen from the population" (p. 174). The two courses in which the assessment was administered were identified and selected based on class size, accessibility, and enrollment of a diverse variety of majors.

The selected courses comprising the purposive sample were perceived to contain a relative mix of freshman, sophomores, juniors, and seniors. Specifically, one course was a 100 level course predominantly taken by freshman and sophomores, while the other course was a required college course predominately taken by juniors and seniors. Both were deemed to be courses which were most closely representative of the entire college. However, based on the nonprobability method of collection, no attempt was made to generalize the results beyond the respondents (Ary et al., 2006). Data were collected from the two selected courses in which students were asked to assess instructor immediacy, classroom demographic information, and their personal motivation in the class they had attended *immediately previous* to the class in which collection occurred.

Instrumentation

Each student was given the opportunity to complete four assessment instruments, the Immediacy Behaviors Instrument, both Verbal and Nonverbal, (Gorham, 1988; Richmond, Gorham, & McCroskey, 1987), and the Self-Efficacy and Task Value for Learning and Performance portion of the Motivated Strategies for Learning Questionnaire (MSLQ) created by Pintrich, Smith, Garcia, and McKeachie (1991, 1993).

The Verbal Immediacy Behaviors (VIB) instrument consisted of 20 Likert type questions, each ranging from 1 (*Never*) to 5 (*Very Often*). The Verbal Immediacy Behaviors instrument had previously attained alpha and split-half reliabilities ranging from .83 to .94 (Christophel, 1990). Based on previous recommendations (Gorham, 1988) and the results of the pilot test, four questions were deemed unreliable and were removed from the study. The 16 item instrument yielded a pilot study Cronbach's reliability coefficient of 0.86 (n = 27), and a post hoc Cronbach's reliability coefficient of 0.83 (n = 208).

The Nonverbal Immediacy Behaviors (NIB) instrument consisted of 14 Likert type questions, each ranging from 1 (*Never*) to 5 (*Very Often*). In previous studies, the Nonverbal Immediacy Behaviors instrument has demonstrated summated reliabilities ranging from 0.73 to 0.89 (Christophel, 1990; Richmond, Gorham, & McCroskey, 1987). The pilot study revealed a

Cronbach's reliability coefficient of 0.82 (n = 27). A post hoc Cronbach's reliability analysis was 0.85 (n = 208).

The Self-Efficacy for Learning and Performance instrument consisted of eight Likert-type questions similarly scaled from 1 (*Not at all true of me*) to 7 (*Very true of me*). Previous Cronbach reliability for the self-efficacy portion of the MSLQ was 0.93 (Duncan & McKeachie, 2005). For the purposes of this research, the scale descriptors (*Not at all true of me*) and (*Very true of me*) were modified to read (*Strongly disagree*) and (*Strongly agree*). For instance, when answering the question, "I expect to do well in this class," participants were asked to rate their responses on a Likert-type questionnaire scaled from 1 (*Strongly disagree*) to 7 (*Strongly agree*). A panel of experts consisting of graduate students and professors were asked to assess the validity of such a change, and all questions with the new scale descriptors were deemed valid. The MSLQ with the modified scale descriptors was administered to college students. The pilot study revealed a Cronbach's reliability coefficient of 0.96 (n = 27). A post hoc Cronbach's reliability analysis was 0.96 (n = 208).

The task value measurement chosen for the research was the Task Value component of the Motivated Strategies for Learning Questionnaire (MSLQ) created by Pintrich, Smith, Garcia, and McKeachie (1991, 1993). The Task Value measure contained six Likert-type questions scaled from 1 (*Not at all true of me*) to 7 (*Very true of me*). Previously administrations of the Task Value segment of the MSLQ yielded a reliability coefficient of 0.90 (Duncan & McKeachie, 2005). For the purposes of this research, the scale descriptors (*Not at all true of me*) and (*Very true of me*) were modified to read (*Strongly disagree*) and (*Strongly agree*). For instance, when answering the question, "I am very interested in the content area of this course," participants were asked to rate their responses on a Likert-type questionnaire scaled from 1 (*Strongly disagree*) to 7 (*Strongly agree*). A panel of experts consisting of graduate students and professors were asked to assess the validity of such a change, and all questions with the new scale descriptors were deemed valid. The MSLQ with the modified scale descriptors was administered to college students. The pilot study (n = 27) revealed a Cronbach's reliability coefficient of 0.83. The post hoc Cronbach's reliability was 0.93 (n = 208).

Data Collection

The target population consisted of students enrolled in two College of Food, Agriculture and Environmental Sciences courses at the Ohio State University. As a result of the nonprobability, purposive sampling technique, no efforts were made to generalize the results past the respondents.

Both courses had a combined enrollment of 250 students. Of the 250 possible respondents enrolled in the courses, 212 respondents returned questionnaires, with four questionnaires incomplete or missing more than five percent of responses. The four incomplete questionnaires were removed from the study resulting in a useable sample of 208 respondents.

The institutional review board protocol for this study prevented the researchers from recording specific student names. As a result, the researchers were unable to take any class role or attendance measures. Thus, the researchers were only able to report the number of returned questionnaires and, since there were no individual identifiers, calculation of nonrespondent rate was difficult. The researchers chose to use the more conservative response rate calculation and, despite some students not attending class on the day of assessment, the response rate was calculated based on overall course enrollment. The enrollment for one course was 105 students, with 85 students returning completed questionnaires, for a response rate of 81 percent. The enrollment for the second course was 145 students, with 123 completing usable instruments, for a response rate of 85 percent. No attempt was made to follow up on nonrespondents as they were unidentifiable.

While the students surveyed attended one of two selected courses, the selected measurement was on the course *immediately preceding the course in which collection occurred.* The method of collection, commonly used in past research studies (Plax, Kearney, McCrosky, & Richmond, 1986; Gorham, 1988; McCroskey, Richmond, & Bennett, 2006; Gorham & Christophel, 1992), was intended to maximize variability and minimize threats to validity.

Data Analysis

Data were analyzed using the SPSS 16.0 statistical software package. An alpha level of .05 was set *a priori*. Correlational analysis, utilizing Bartz' (1999) strength of association descriptives, was performed on summated means in order to address the relationship between verbal immediacy, nonverbal immediacy, self-efficacy, and task value. The data utilized in this research were part of a larger research study.

Results

A brief demographic overview indicated that of the 208 respondents, 64% were male and 36% were female. The respondents indicated assessing instructors who were 71.2% male and 28.4% female, ranging in age from 20-29 (n = 45), 30-39 (n = 42), 40-49 (n = 45), 50-59 (n = 59), 60-69 (n = 14), and greater than 70 (n = 1). The student participants reported assessing 50 course prefixes based on the course they attended *immediately preceding the course in which collection occurred.* Of the 50 course prefixes the two largest categories were chemistry (n = 23, 11.1 %) and math (n = 20, 9.6%). The students identified 20.7 % of the classes as elective and 78.4 % as required. The demographic data pertaining to the verbal and nonverbal immediacy assessments is descriptive of the instructor, while the data pertaining to self-efficacy and task value is descriptive of the student.

Research questions one and two combined sought to determine the relationship between instructor verbal and nonverbal immediacy, and student self-efficacy and task value. Pearson product-moment correlations were calculated and Table 1.0 describes the relationship between the summated constructs. Bartz (1999) adjectives describing the strength of the relationship were utilized. Bartz identified .00 –.19 as very low, .20 – .49 as low, .50 – .59 as moderate, .60 – .79 as strong, and .80 or higher as very high.

Table 1
Relationship between verbal immediacy, nonverbal immediacy, self-efficacy and task value

		Nonverbal Immediacy	Self-efficacy	Task value
Verbal Immediacy[a]	Pearson Correlation	.601*	.334*	.234*
	Adjective [b]	Strong	Low	Low
Nonverbal Immediacy[a]	Pearson Correlation	--	.209*	.152*
	Adjective [b]		Low	Very Low
Self-efficacy	Pearson Correlation		--	.545*
	Adjective [b]			Moderate

Note. n = 208
[a] Denotes independent variables. [b] Adjectives according to Bartz, 1999.
* Correlation is significant at the 0.05 level (2-tailed).

Examination of the relationship between the constructs revealed relatively low levels of association. Verbal immediacy had a low correlation with self-efficacy and task value. Nonverbal immediacy evidenced a low association with self-efficacy and a very low association with task value.

All measures of association between the variables yielded a statistically significant result. However, based on the nonrepresentative sampling method and the influence of the size of the sample, statistical significance should be interpreted with caution. A statistically significant correlation means the observed results are likely to be observed in the population. King and Minium (2008) cautioned against the indiscriminant use of statistically significant correlations. King and Minium advised to, "Be careful, a significant *r* does not mean that the association is important. The expression "significant correlation" means only that H_o: ρ= 0 has been tested and rejected, and "nonsignificant correlation" means only that H_o: ρ= 0 has been tested and retained—nothing more, nothing less" (p. 290). King and Minium encouraged the use of effect size and coefficient of determination measures to further elucidate the practical significance of the findings.

Cohen (1988) developed a list of effect size descriptors for describing the magnitude of a correlation. Cohen listed r = .10 (r^2 = .01) as a small effect size, r = .30 (r^2 = .09) as a medium effect size, and r = .50 (r^2 = .25) as a large effect size. Based on the descriptive categories identified by Cohen, the effect sizes between self-efficacy and verbal immediacy would be considered as medium. The effect sizes between nonverbal immediacy and self-efficacy, and between verbal immediacy, nonverbal immediacy, and task value would be considered small.

The coefficient of determination (r^2) was the measure used to further describe the results. The coefficient of determination, as well as the effect size descriptor, are two important indicators of the practical significance of the findings (King & Minium, 2008). Research indicated that 11 percent of the variance in self-efficacy can be explained by verbal immediacy, and four percent of the variance in self-efficacy can be explained by nonverbal immediacy. Specific to task value, six percent of the variance can be explained by verbal immediacy and two percent by nonverbal immediacy. Both effect size and coefficient of determination provide insight as to the practical significance of the association results.

Conclusions/Recommendations

Only 11 percent of the variance in self-efficacy was explained by teachers' verbal immediacy. While this may not seem to be practically significant, it is important to recognize this research does not address the amount of student self-efficacy that is dependent on, or influenced solely, by the environment. Bandura established that the amount of influence of the triadic determinants [(a) personal factors in the form of cognition, affect, and biological events, (b) behavior, and (c) environmental influences] would vary from individual to individual. Bandura (1986) stated that, "The relative influence exerted by the three sets of interacting factors will vary for different activities, different individuals, and different circumstances" (p. 24). It is possible that the environmental influences to self-efficacy may only account for a portion of student variance in self-efficacy. An 11 percent variance may be a sizeable portion when considering the potential overall influence of environmental factors which form only one edge of the triadic reciprocality triangle.

Further research should examine all three of the triadic determinants and attempt to determine their relative inputs to student self-efficacy. Bandura (1997) indicated that the relative influence would vary from individual to individual. However, focused research might identify some commonalities. Determinants evidencing the highest potential to maximize student self-efficacy should be identified and researched. Once individual factors are determined, instructors will have the opportunity to reflect on their instruction and modify teaching to optimize the development of student self-efficacy.

Bandura (1997) asserted that one of the primary benefits of self-efficacy is that it is able to be influenced by others. Self-efficacy can be developed through mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states (Bandura). According to Schunk (1991) instructors should be purposeful and careful in interactions with students as, ". . . students derive cues signaling how well they are learning, which they use to assess efficacy for further learning" (p. 209). Instructors wishing to promote self-efficacy development in students should provide students the opportunity to engage in authentic mastery experiences, group and social interaction, and classroom activities designed to encourage participation and foster a welcoming and non-threatening classroom climate (Pajares, 2002). Mastery experiences, theorized to be the largest contributor to self-efficacy, can be enhanced by class instructors who break down complex skills into easily mastered subskills (Bandura).

Instructors who allow students to experience small frequent successes will have the greatest likelihood of increasing student self-efficacy (Bandura).

Nonverbal immediacy accounts for four percent of the variance in self-efficacy. Based on the results of this research, very little variance in self-efficacy can be explained by nonverbal immediacy. This may relate to the four distinct sources commonly used to establish personal self-efficacy. Bandura defined the four sources, in order of the greatest contributor to self-efficacy to the least contributor to self-efficacy, as: mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states. Physiological and affective states, which according to Bandura (1997) are likely to promote the least increase in self-efficacy, would seem, out of the four sources, to be the most logical area of instructor nonverbal influence. Perhaps instructors are unable to directly alter the physiological and affect states of students as a result of their nonverbal communication. The lack of instructor nonverbal immediacy may not translate into a physiological or affective stimulus. Rather, the absence of such behaviors may simply allow the student to remain physiologically and affectively unchanged.

The relationship between verbal and nonverbal immediacy and task value was minimal. Task value appears to be a motivation trait which bears little relationship with teacher communication. Similar to self-efficacy, it is important to recognize that there may be only a small portion of task value that is able to be influenced by the instructor. Examination of the theory underlying task value provides clues as to possible reasons for the low correlation.

Expectancy-Value theory, the theory which supports task value, considers four primary types of value: attainment (importance), intrinsic (interest), utility, and cost (Wigfield & Eccles, 2002). The MSLQ purports to measure the first three, yet doesn't distinguish between them. The six item MSLQ measure would probably be considered too short to distinguish between all three constructs. Therefore, the six questions are grouped under the task value heading and the only evidence for the measurement of importance (attainment), interest, and utility value is in the actual wording of the individual questions. The lack of distinction in assessing the sub-constructs to task value created difficulty in analysis of the findings.

Task value, as a measure of motivation, appears to be a more "personal" measure which is greatly dependent on contextual and personological variables (Pintrich, 1994). The nature of attainment value and the failure of the measurement to assess the contextual and personological variables may moderate the current findings. Some students, based on classroom context and personological variables, may indicate increased task value in a course, while, some students may indicate very low levels of task value for a course. The differences in task value scores may in no way reflect the communication behaviors of the instructor. Rather, the intrinsic nature of task value, augmented by a whole host of confounding variables, may bear responsibility for the small levels of association. Future research should examine the components of task value independently. A different, longer measure should be employed which is able to discriminate between the components of task value. Instructor behaviors may influence task value, but possibly only the attainment and intrinsic aspects.

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The Meaning of Effective Teaching through the Lens of Award Winning Faculty

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Abstract

The purpose of this phenomenological study was to describe the phenomena of effective teaching for award winning faculty instructors at a large Midwestern University. Nine university faculty members were selected to participate in this study based on their recognition as award winning instructors and by a nomination from their respective college's academic dean. Each participant took part in a semi-structured interview with a member of the research team. After analysis, several themes were identified and fell into two broad categories dealing first with the act of effective teaching and second, the act of becoming and evolving as an effective teacher. One sub-theme was the need to focus on students. While all acknowledged the importance of course content, they noted that if the focus is not on the student, content is of little consequence. Additionally, sub-themes indicated that effective teaching required dialogue, was relevant and led to critical thinking and progression which caused students to think about content in a new way. Further, themes describing teaching as scholarship and teaching and learning being a process of growth emerged. These themes provide valuable insight into how award winning faculty instructors think about their teaching.

Introduction and Conceptual Framework

Higher education in modern times is facing scrutiny from stakeholders regarding not only the value of the curriculum being taught as well as the quality of classroom teaching. Over the past two decades, higher education in general and the college classroom in particular has shifted to a more consumer-oriented, learner centered environment with a focus on accountability (Camblin Jr. & Steger, 2000; Huber & Hutchings, 2005). While it is commonly and often intuitively known among many college teachers that the general culture, needs, and level of preparation of the entering college student has changed (Choy, 2002), shifts have also occurred in the number and nature of subjects taught in higher education (Huber & Hutchings, 2005). Sweeping changes in the student population, the content offered, and general concern for teaching as a serious intellectual endeavor in higher education have been met with a shift in faculty focus and concern about pedagogy (Lindholm, Astin, Sax, & Korn, 2002; Stewart, 2009).

Research on teaching and teacher effectiveness can be divided historically into two different approaches (Cruikshank, 1990). Prior to 1960 the bulk of the research conducted regarding teacher effectiveness centered on characteristics or traits exhibited by teachers and then deemed exemplary by administrators or those charged with evaluation of teacher performance (1990). Following this phase, a shift toward identifying specific traits and behaviors indicative of effective teaching became the dominant research focus in the literature on pedagogy (1990).

Rosenshine and Furst (1971) identified eleven different performance criteria related to teacher effectiveness and while their results provided insight into many variables related to effective teaching, they incited little direction to those charged with the responsibility of teaching content. While the Rosenshine and Furst literature has been widely utilized in teacher education programs in agriculture as the model of effective teaching, its use in modern teaching and learning environments is widely debated. Additionally, one must question if these traits are applicable nearly 40 years later, particularly in a *university* classroom that is much different than the settings described in the studies that Rosenshine and Furst used to identify these traits.

More recently, studies have been conducted to identify common practices among highly effective teachers. In one such study, 92 elementary and middle school teachers were followed over the course of a year (Bransford, Darling-Hammond, & Lepage, 2005). While the teachers participating in this study varied greatly on several different variables, the traits and elements of effective teaching that were identified were similar among all participants. Traits such as setting clear expectations for students, working the room while teaching, encouraging communication between student and teacher as well as between students, and having a clear organized plan were some of the key effective teaching characteristics identified (2005). While potentially useful at the postsecondary level, Menges and Austin (2001) argued that there are distinctive differences between education at the K-12 level versus postsecondary education. They noted the differing roles and missions between the two as well as the fact that university faculty, while highly trained in their respective fields, often have little if any training in teaching (2001). These are only two of the numerous distinctions that the authors draw between the two, thus the need for direct inquiry at the postsecondary level regarding effective teaching techniques.

Within the discipline of agricultural education specifically, studies on teaching effectiveness have examined teachers of agriculture at the secondary level (Larsen, 1992; Miller, Kahler, & Rheault, 1989; Newcomb, Warmbrod & McCracken, 1993; Roberts & Dyer, 2004). Additionally, agricultural education provides sound research in the cognitive levels of college teaching (Whittington, 2009; Lopez & Whittington, 2001; Bowman, & Whittington, 1994) and the needs and current levels of critical thinking (Ricketts, Rohs, & Nichols, 2005; Rudd, Baker, & Hoover, 1998) that are possessed at the college level. Yet, missing from the literature is a focus on effective teaching in agricultural sciences and related disciplines at the postsecondary level. This lack of literature, coupled with research priority area three of the Agricultural Education in University and Postsecondary Settings section of the *National Research Agenda: Agricultural Education and Communication 2007-2010* (Osborne, n.d.) helps to create an argument for the need to further investigate effective teaching at the postsecondary level.

Bransford, Darling-Hammond, and Lepage (2005) outlined a framework for organizing and understanding teaching and learning, that suggested that to be an effective teacher one must have a solid base and expertise in three broad areas. Effective teachers must have a knowledge of their students development as learners, a sound understanding of the subject being taught, and finally a knowledge of teaching (2005). It can be reasonably assumed that university faculty have a solid understanding of their respective content area. However, most have little or no formal education or training in pedagogy or learning psychology. Despite this, faculty are expected to provide instruction and many do so with great success and are identified by their students and peers as being exemplary teachers. Boyer (1990) stated that “teaching begins with what the teacher knows…Pedagogical procedures must be carefully planned, continuously examined, and relate directly to the subject taught" (Defining SoTL Hand-out, 2008). This process may seem very logical to those with formal training in teaching, however, do effective college teachers describe a similar approach? With this in mind the researchers sought to determine what exemplary teaching means to award winning faculty at the University of Missouri.

This study was conceptualized through the lens of research on teaching, learning, effective teaching, and how teachers learn to teach. It was posited that, while faculty by and large have no formal training in pedagogy, the goal for learning to teach and subsequently becoming an effective teacher, is to develop habits of mind to approach teaching as an intellectual inquiry in both their own teaching effectiveness as well as within the literature on teaching. Four kinds of research bases to support teaching and learning have been noted in the teacher education literature including: research on how people learn, the influences of teaching strategies on what and how people learn, research on teacher professional development that influences student learning, and finally research that examines how teachers learn to teach in ways that support student learning (Darling-Hammond & Bransford, 2005). Specifically, this study posited that to clearly define the phenomenon of effective teaching at the college level, one must investigate how teachers *successfully* learn to teach in ways that support student learning.

Exemplary teaching is rewarding and acknowledged by some as scholarly (Evans & Tress, 2009; Shulman, 2000). In fact, Shapiro (2006) posits that effective teaching should be taken more seriously in the promotion and tenure process. The academic literature outside the realm of education journals documents the positive results of exemplary teaching, yet it is acknowledged that more guidance toward effective teaching in the areas of faculty development is needed. For example, the literature in the disciplines of medicine (Fincher, 2000); animal science (Buchanan, 2008); and psychology (Marsh & Roche, 1997) all call for a more codified knowledge base on effective teaching as well as faculty development efforts to help faculty implement effective practice. Furthermore, research (Hutchings, 2000) notes that a need is present in the overall profession of college teaching and in the improvement of student learning. An opportunity awaits agricultural educators in filling a need for training and examining the process of effective teaching at the post-secondary level, and faculty members in agricultural education as teacher educators can be positioned to lead the charge, not only their colleges but university wide, in developing faculty for effective practice in teaching.

It can be posited that faculty instructors who are recognized for their teaching are performing at highly effective levels in the classroom. As a result, it is increasingly important that the phenomena of effective teaching be understood from the viewpoint of these award winning instructors to provide direction to current and future faculty as to how they might improve their teaching effectiveness. In fact, researchers claim that some investment in time and attention to developing skills in teaching is likely to have substantial payoffs in self-satisfaction and effectiveness in a career (McKeachie & Svinicki, 2006). Further, a study of expert and novice teachers found that experts were more likely to be able to identify tasks that were important to the teaching process and were more likely to consider the consequences of their actions in the classroom (Berliner & Carter, 1989). In addition, expert teachers differed from their novice counterparts in their willingness to share their expertise when the opportunity presented itself (Shim & Roth, 2009). If these clear distinctions exist between expert and novice teachers then should not more research be conducted in regard to what it means to be an exemplary or effective teacher? Additionally, previous study sought to examine effective teaching from the viewpoint of undergraduate students and indicated that these students identified six categorical turning points that define the effective teacher (Docan-Morgan, 2009). While informative in its own right, perhaps the best sources for this inquiry is not undergraduate students but rather, those teachers who have been deemed to be exemplary.

Purpose and Central Question

The purpose of this study was to describe the phenomena of effective teaching for award winning faculty instructors at the University of Missouri. The central question that guided this research was "What does it mean to award winning instructors to be an effective teacher?" Additionally, the following sub-questions were developed to further guide the development of the study and the analysis of the data collected. The sub questions were:

1. How do award winning teachers characterize a person who exemplifies the term effective teacher?
2. What do award winning teachers do inside and outside of the classroom that make them effective? What don't they do?

Methods and Procedures

Sample

A purposive sample of nine University of Missouri faculty members (5 male, 4 female) served as the participants for this study. The researchers selected these participants in order to ensure that attempts could be made to represent the various colleges at the university and to have an adequate number of individuals who shared the phenomena. The participants represented five different Colleges with three faculty from the College of Agriculture, Food and Natural Resources and the College of Liberal Arts and Sciences respectfully. The College of Business, College of Education, and the School of Journalism were each represented by one faculty participant. According to Polkinghorne (1989) it is suggested that between 5 and 25 individuals comprise the sample for a phenomenological study. While demographic characteristics were not a criterion, the following characteristics were observed. The participants represented various disciplines in the bench sciences, social sciences, and liberal arts and all taught at least one undergraduate course. Five of the participants held the rank of full professor with the remaining four holding the associate professor rank.

Research Design

According to Creswell (2007), a phenomenological study "describes the meaning for several individuals of their lived experiences of a concept or phenomenon" (p. 57). In conducting this study the researchers followed the process outlined by Moustakas (1994). Philosophically, the researchers were guided by the four philosophical perspectives in phenomenology as outlined by Stewart and Mickunas (1990).

When completing a phenomenology the researcher's intent is to gain a deeper understanding of a particular topic. To accomplish this, the researcher must first set aside their own beliefs and experiences with the phenomena of interest. Through a process called bracketing the researcher acknowledges their current understanding of the phenomena as well as any preconceived notions or biases they may hold in order to be open and receptive to the data collected and the resulting themes identified regarding the phenomena (Colaizzi, 1978; Creswell, 2007). As former teachers and current university personnel working in teacher education it was important for the researchers to bracket their experiences. As part of this process the researchers discussed their personal views regarding teaching and the characteristics of an effective teacher. This process served two purposes, first, it allowed each researcher to acknowledge the thoughts and views that they currently held and second, the differences between each researchers own views helped to highlight the fact that people have different views and different ways of expressing them. This helped to prepare the researchers for the interview process and allowed them to be much more open and receptive to the participant's responses and the resulting themes.

Procedure

Upon receipt of exempt status from the University of Missouri Institutional Review Board, potential participants were contacted by the researchers and asked to participate in the study. The following criteria were used to select those faculty who were potential study participants. First, the researchers did an exhaustive review of faculty members who teach undergraduate courses at the university and had been recognized for the excellence in teaching with multiple teaching awards. Those individuals who had won at least two awards for their teaching beyond the departmental level were considered potential study participants.

Following creation of this list, the researchers contacted the Associate Dean for Academic Programs for each of the University's respective colleges and asked them to nominate faculty members whom they felt were the best undergraduate teachers in their programs. This request resulted in 62 individual faculty from across several disciplines. The researchers then created a list of faculty who met the criteria of being award winning and also received a nomination from their college's academic dean. At this point the researchers generated a list of 20 faculty who met all of the inclusion criteria. Based off of this list a group of ten faculty members was created to serve as the participants for the study. While selecting this list the researchers attempted to select faculty from various colleges and departments representing the bench sciences, social sciences, and the professions.

Those faculty who met all criteria and were selected as the participants for the study were sent an email by the research team briefly explaining the study and asking if they were willing to complete an interview of approximately one to one and one half hours in length. From this initial call six faculty indicated their willingness to participate. For those who declined, the research team selected a replacement from the 20 faculty members who met all of the inclusion criteria and asked them to consider participating. This process was repeated with nine total faculty members agreeing to participate in the study.

For each interview conducted the researchers first obtained informed consent from each faculty participant. After consent was obtained a semi structured interview protocol was utilized. To begin the interview participants were asked to do the following: "Describe an outstanding teacher. What makes this educator outstanding?" Although a set of questions were included in the protocol, it was the researchers intent to let the faculty participants drive the interview, only asking specific questions to direct or guide the participating faculty member toward various topics. Each interview was recorded using a digital recording device and then transcribed verbatim. Interviews ranged from 40 minutes to one hour and 40 minutes in length. At the conclusion of each interview the participants were thanked for their time and asked if they were willing to be contacted again if any clarification by the researcher was needed during transcription and data analysis.

Data Analysis

Recurring statements were identified after several readings of the interview transcripts. Based off of these reoccurring statements themes were developed and transcripts were coded by hand using highlighter markers with each theme coded by a different color. Throughout the process the researcher adhered to the phenomenological method, making every effort to maintain rigor by completing a thorough review of the literature, bracketing personal views and experiences, conducting interviews that resulted in data saturation, and then utilizing member checks to confirm the identified themes (Creswell, 2007). All participants were provided with copies of the interview transcripts and were asked to confirm their accuracy. The researchers also provided each participant with the finished manuscript and asked them for confirmation and approval of the stated findings. Additionally, an audit trail, reflexive journals, and peer debriefing were utilized to maintain trustworthiness and credibility of the qualitative data analysis (Denzin & Lincoln, 2005). While every effort was made to maintain the trustworthiness and credibility of the study, it should be noted that the findings are limited to the nine faculty members studied and readers should use caution when transferring these findings to other contexts (Lincoln & Guba, 1985).

Results

As stated previously, the purpose of this study was to describe the phenomena of exemplary teaching for award winning faculty instructors at the University of Missouri. A thorough review of the data collected during the interview process resulted in the identification of two major themes and several common subthemes. The two major themes identified helped to categorize the participant's responses into subthemes connected to the act of effective teaching and the act of becoming and evolving as an effective teacher. These themes and subthemes emerged after repeated readings of the interview transcripts and are not presented in any particular order.

The Act of Effective Teaching

The first major theme that was identified dealt with subthemes centered on the actual act of being an effective teacher. Common across all participants was the need to focus on students. Additionally, participants indicated that effective teaching required dialogue and was relevant.

Finally, effective teaching meant helping students develop thinking skills and causing them progress from their current level of knowing to some new level of understanding.

Focus on students.

Participants in this study were adamant that in order to be effective a teacher must place the student as the central focal point in thinking about teaching. Faculty suggested that one of the biggest mistakes that ineffective teachers make is that they focus on the content first rather than first focusing on the students. This does not mean that faculty deemed the content as unimportant; rather it meant that regardless of how important the message, if one has not first considered the students' needs, a teacher has little chance of reaching the student in the first place. According to one participant, "If you are not thinking in terms of how can I help the students understand the material you've got a huge barrier to get over."

In placing students as a central focal point in thinking about teaching, the teacher must have an understanding of the student audience. Faculty members indicated that they must have some idea about who the student body is as a whole, and at the same time recognize that the group is changing, and that students are very likely much different from the kinds of learners they were in college. One participant described the differences between how today's students learn versus how the participant learned. They stated:

> … when they are thinking about learning they are usually thinking about learning with some little electronic device and most of these electronic devices provide you with menus. So, it's a more of a menu driven form of learning than what my generation came up with. Basically we weren't…we didn't have menus.

By first focusing on the student, this instructor recognized the differences between how today's students approach learning and then develop approaches that will help students be successful.

Focusing on the student is perhaps the first step to creating an environment where a student is willing to engage in the learning process. When the central focus of instruction is placed on a student, it sends a message to the student that they are important and are an integral component of the learning process. Instructors further indicated that in classroom it is important to create an environment where learning is a two way street. Focusing on the student was implemented directly in the classroom in often simple ways. One example was faculty members making an effort to know students' names. "I appreciate someone who knows my name and so I kind of go that other people do to." This same participant indicated that even in a class of more than 200 students it was still possible to learn 80 - 90% of their names. This simple act can have an extraordinary effect in terms of care for students and an emphasis on them and their learning as the focal point of effective teaching.

Effective teaching requires dialogue and is relevant.

By first focusing on students and making sure that their needs were understood, faculty were then able to create a dialogue between themselves and the students. This dialogue fostered a situation where students feel that they are active participants in the learning process. When a student is actively engaged in the process of learning then faculty members are more than willing to meet them half way, or in some cases beyond that. As one participant explained:

> …there's that old adage…something like a student or a child…isn't a vessel to be filled but a light to be turned on or something like that. I don't want to cram stuff down into the mouth or the brain of an unwilling student, but, you know, if the student is there and wants to learn, then you know, I'll play, I will play as far as you want to go.

This was a common theme among all participants. Exemplary teachers stressed the notion that students have a responsibility in the learning process. As a teacher, you must recognize this and hold not only yourself accountable but also the student. To further make this point one participant stated:

> Part of college is taking responsibility for your own learning…Can I force someone to learn who doesn't want to learn? I don't think so. Can I force them to memorize a bunch of stuff and regurgitate it on a exam and then give them a grade? Yeah, but that is not really learning and this is not really teaching either.

By creating dialogue with students they become much more engaged in the learning process. The exemplary teacher did everything within their power to plan for, deliver, and reflect on effective teaching. They recognized that it was their responsibility to create an environment where students are more likely to engage in the learning process, but they acknowledge that ultimately the students must do their part as well.

When talking about their teaching, award winning faculty instructors stressed the need to make the content relevant to the students. Through their actions, they tried to address issues that were authentic and connected to real life or current topics. Often, faculty used a more problems-based approach to their teaching and incorporated opportunities for their students to actually do some project or task that would allow the students to experience the topic being taught. Additionally, it was noted that learning experiences often extended well beyond the walls of the traditional classroom. To help illustrate this theme one faculty member shared the following:

> We are putting together a mentoring program; you see this is how I think about teaching. We have an advisory board that assists us with this so my first thought was rather than have faculty or alumni do the mentoring program why not have students do it… they will form their own committee, they will put this together but when they go out looking for a job they will be talking about all the people they interacted with, how they did it, you know, so to me, boy, that is the kind of stuff that I think is as is important as what people do in the class.

In this case, the faculty member viewed the opportunity for the student to apply the skills they were discussing in class to a real life situation as vital to the students' learning experience.

Effective teaching is thinking and progression.

Participants all indicated how much they enjoyed their respective content areas and sharing their knowledge and love for their discipline with their students. However, all indicated that more important than simply teaching students' content, they strove to cause students to think about the content in a new way and critically analyze what they were being taught. More than simply sharing content, award winning instructors had the goal of creating critical thinkers and teaching students critical thinking skills that would be relevant to other aspects of their life. One faculty member explained this desire to help students become critical thinkers as follows:

> They may forget that William the Conqueror came into England in 1066 and took over and something like that, but I hope that they kind of begin to, they use the skills of, of the critical thinking, of learning not to take something at face value, but, that they dig a little deeper, that they sometimes, they need to do this throughout life.

By encouraging students to discover and utilize their critical thinking skills effective teachers focused on helping a student progress from where they currently are in their learning to some new point. This progression seemed to be their ultimate goal. In fact, effective teachers noted that they enjoyed watching students progress through the specific course they were teaching but were also motivated by watching the students grow and progress throughout their career at the University. Effective teachers took a lot of pride in watching their students be successful. According to one faculty member, "you know the students don't realize this but when our students succeed, we are ecstatic. I mean this is cool man!" One participant explained this notion of progression when asked to describe an effective teacher by stating:

> I think it's somebody who is able to take a young person sitting in a class and help them undergo this transformation from thinking of themselves as a student to thinking of themselves as a practitioner of that discipline. For example, there's a difference in thinking of yourself as a student in an animal science class as opposed to I'm an animal scientist. I really think that the really, really outstanding teachers are those who are able to get young people to put themselves in the position of being practitioners of that discipline.

The above quote helps to explain this notion of effective teaching. Effective teachers cause their students to think about issues in a different way than they had previously. By causing this shift in thinking, effective teachers create a situation where students progress from being simply students in a class to practitioners of a particular discipline.

The Act of Becoming and Evolving as an Effective Teacher

The second main theme that was identified dealt with the actual act of becoming and evolving as an effective teacher. Subthemes were identified that helped to explain how effective teachers viewed the process of effective teaching. First, participants discussed their views of teaching in terms of it being a form of Scholarship. Secondly, they viewed the entire teaching and learning process as a process of growth, not only for the teacher but also for the students.

Teaching as scholarship.

Exemplary teachers all agreed that teaching was a valid form of scholarship and that it was part of their professional responsibility to provide effective instruction. In describing the similarities between teaching and research one participant stated "it could be that they draw from the same skill set." They went on to explain the two activities by stating:

> I mean ultimately what is empirical research which is what I do. It's what do we know about a field, what don't we know? How can I design a study to learn something that we don't know that would be interesting and then executing the plan and doing it? Ok, what's a lecture? You know, teaching, uhm, what do we know about this area, what's important to know for the student? How am I going to communicate it? So, you know, both of them are some level of just thinking.

The above view of scholarly teaching was consistent among participants. All indicated that they used this approach when planning for their teaching.

Additionally, participants agreed that their scholarship complimented their teaching. According to one faculty member "what I read to do my research is uhm, I can incorporate in my classroom in a variety of ways. So yeah, definitely, I think it is best when those [teaching and research] go together." In fact, participants indicated that often teaching was an outlet for them to share their scholarship, perhaps with more people than would view it when published in a journal. One participant explained:

> I think I am to the point where I get to decide where I am making the most impact. I have rationally thought about this and I love doing research and have four undergraduates in the lab doing research and I am never going to give that up, but I also think that spending ten thousand dollars on chemicals and however much time publishing something that only three people are going to read in the world is not making a big impact.

Through the lens of effective teachers, teaching was not viewed as more important than research but rather, both possessed the potential to incite a great deal of impact and both deserved to have time devoted to doing them well.

Teaching and learning as growth.

Exemplary teachers viewed the process of teaching and learning as a process of growth. Nearly all of the participants indicated that they did not view themselves as being experts but rather they were constantly striving to improve the quality of their teaching. Participants were asked if they felt that exemplary teachers were born or made. While all acknowledged that people are all born with certain talents and aptitudes, to be an effective teacher you must work very hard. All agreed that exemplary teachers are made. On participant used the following example:

> Albert Pujols is the best hitter on the planet. However, was he born a great hitter or did he make himself a great hitter. And, no matter what your natural talents are, how

> athletically capable you are, unless you work at hitting you're not going to be a great hitter. And I think the same is true of almost everything.

Exemplary teachers stressed the need for teachers to constantly work at improving their teaching skills. Several participants indicated that they felt that it was vital that they participate in professional development activities that related to teaching not only at their own universities but also at regional and national professional development programs. The Wakonse program, an annual teaching conference, was mentioned on several occasions with participants indicating that they felt that participating in the program and hearing about how others approach teaching helped to shape their own practice. Further, exemplary teachers indicated that they often implemented strategies that they adapted from other teachers.

Equally important according to participants was the need to reflect on the teaching and learning process. One participant told the following story about a junior faculty member concerned by how her classes were going. This story perfectly describes the importance of reflection but also ties in many of the all of the other themes that emerged from the data collected. The participant stated:

> A little bit of reflection is often very good, which is one of the things I tell other faculty. You will hear new faculty a lot of time go, God, class isn't going well, I am going to go get the book and I am going to read through this chapter again so I know exactly what…and I am immediately like, time out, stop, do not go do that. You already know way more than the students, the issue is not in the book. Your problem, if it's not going well, is your interaction with the students. You're not connecting with them, you're not engaging them; you need to do something different. Reading the book is not, ever, going to be the answer to your question.
>
> And, we had a young faculty member a few years ago go, I mean, almost verbatim that's what she said, and I said don't you dare do that and if I find out you did it, it's going to be hard getting me out of your office for awhile. And I said, how long would it take you to read that chapter, an hour? And she said, yeah that probably I could do it in an hour. Alright, here is what I want you to do, you take a pad of paper, a pencil, you go somewhere for an hour and what you think about is what could I do to get these students to actually physically do something that would relate to the topic that you are trying to talk about. That hour will be substantially more valuable to you than anything you are going to get out of the book and I would stand by that.

This quote illustrated the essence of the manner in which exemplary teachers viewed teaching. First, they recognized that they already know more than their students and as a result really need to focus on them before they ever worry about the content. Second, it exemplified the need for finding ways to create a dialogue with the students and make the information being taught relevant. Finally, it helps to illustrate the importance of reflection and the need to always search for ways to grow as a teacher.

Conclusions/Implications/Recommendations

From the findings in this study, it was concluded that teaching and being an excellent teacher are complex issues. While the individual nuances of teaching may vary from individual to individual and may work in one situation while not in another, there are some common themes that emerged when award-winning teachers were asked to describe effective teaching. This study was consistent with prior literature that identified common traits of effective teachers across different disciplines and different levels of teachers (Bransford, Darling-Hammond, & Lepage, 2005). Different in this study, however, was the fact that the essence of effective teaching in the experience of the participants in this study was not a focus on specific teaching skills or traits, but rather a description of particular habits of mind or ways of thinking about teaching. In broad terms these themes centered on the act of effective teaching and the process of becoming and evolving as an effective teacher.

The implication of this conclusion for teaching at the university level seems to suggest that while faculty may have little or no formal training or education in teaching, exemplary teachers talk about teaching and learning much like those who have studied the topic. While the terminology used may be different, the underlying themes are very similar. If this is the case, what can be done to better assist faculty who are struggling with their teaching so that they can become more effective in the classroom?

Perhaps one of the most important recommendations for future practice would be to help struggling faculty recognize the importance of focusing first on the students. When a faculty researcher begins a project, one of the first things that is completed is a thorough review of the related literature. Every effort is made to learn about the topic of interest and to ensure it is understood before progressing. Perhaps a more scholarly approach to teaching should be emphasized. Before entering a classroom a faculty instructor should make every effort to learn about the students they will be teaching. What are their backgrounds? How have they been trained to learn? What expectations do they have from the class and the instructor and how do those expectations align with those of the faculty instructor? By first focusing on the students the faculty instructor is taking an important step toward ensuring an effective teaching and learning experience.

Additionally, it is recommended that more resources be provided for faculty interested in improving their teaching. It is very easy to suggest that faculty need to create dialogue with their students and ensure that students understand the relevance of the material being taught. However, this is easier said than done. Many universities have implemented faculty orientation programs to assist new faculty instructors in developing their teaching skills. The findings from this study suggest that these programs should focus on providing participants with training in teaching techniques and methods and should be made available to faculty regardless of their career stage.

Because teaching and learning effectively requires such an investment of time and effort perhaps promotion and tenure processes should be evaluated (Shapiro, 2006). If institutions truly value teaching, then faculty, especially those in the beginning stages of their career, must be rewarded for their teaching and not placed in a situation where they feel forced to choose between teaching and research. Participants in the study indicated both research and teaching draw from the same skill set. If this is the case and if both teaching and research are necessary and vital to the success of an institution, then faculty professional development programs and performance review systems should help faculty realize the parallels between teaching and research and provide equal rewards for efforts in both areas.

To help better understand the themes identified through this study the researchers developed a Framework for Effective College Teaching (Figure 1). It was concluded from the results in this study that this framework served as a way that the exemplary teaching faculty conceptualized effective teaching. According to the way in which faculty members in this study thought about and thus talked about their teaching, at the core of effective teaching are two major themes dealing with the teaching and learning process. According to the participants in this study, the act of effective teaching depends on three main components: focusing on students, creating dialogue and making teaching relevant, and finally, recognizing that teaching and learning are a process of thinking and progression. Additionally, the act of becoming and evolving as an effective teacher emerged as a second major theme in the ways that the participants in this study conceptualized effective teaching. This theme is supported by the components of teaching as scholarship and teaching and learning as growth.

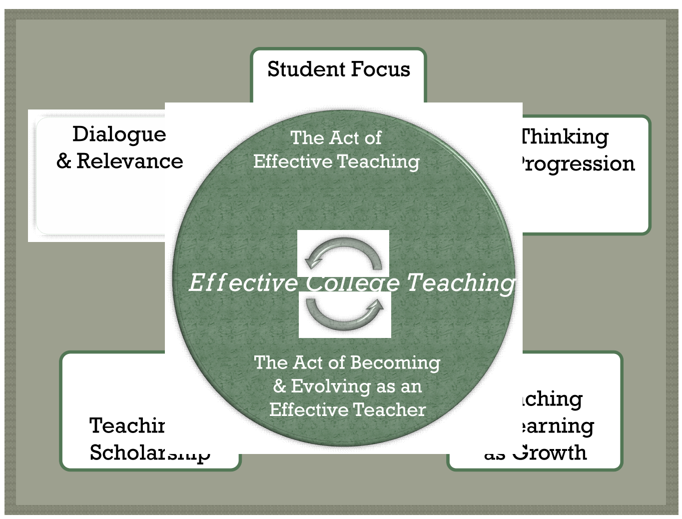

Figure 1. Framework for Effective College Teaching

It is important to note that this framework is merely a visual representation of how the participants in this study conceptualized teaching. It is recommended that this framework be used to develop a questionnaire for use with a quantitative research approach to explore and further validate the findings of this study. While this study provided some insight into how some faculty members think about teaching and learning, more in depth investigation is warranted. It is recommended that further quantitative and qualitative research be conducted on how university students view effective teaching and the connections or disconnect between faculty members' and students' views of effective teaching.

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Early Career Agriculture Teachers and Their Time

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This phenomenological study of early career agriculture teachers sought to determine the meaning early career agriculture teachers ascribe to their time. Seven teachers with a range of experience from mid-first year to beginning of sixth year were chosen. Interviews were used to make meaning of their time. Five themes were found in the information: 1) the day consists of patterns that vary depending upon the time of the year; 2) there is a conscious allocation of work time; 3) the process of managing time adapts and evolves over time; 4) personal and social time for the teacher is woven into or around work; and, 5) tensions exist between how teachers would like to spend their time and how they actually spend their time. Recommendations include taking stock of workload and personal time, identifying times that are most productive and adjusting their schedule to accommodate, developing a rhythm to their work, making decisions about how to spend time and realizing it is an evolving process.

One of the most critical issues in agricultural education is the shortage of highly qualified teachers (Camp, Broyles, & Skelton, 2002; Connors, 1998; Kantrovich, 2007). The argument seems to be that better understanding of the tasks occupying their time could lead to a better understanding of the roles the teacher must fulfill as well as the time consumed by each role, leading to lower stress and higher job satisfaction. Therefore, recent research in agricultural education has focused on the high school classroom teacher and their daily routine, time allocation, job satisfaction, and stress levels (Edwards & Briers, 1999; Myers, Dyer, & Washburn, 2005; Torres, Lambert, & Lawver, 2009). These studies tend to be quantitative in nature and many times call for follow-up studies that could be qualitative in nature to gather more details. Rarely does this follow-up happen.

The National Commission on Teaching and America's Future (1996) stated highly qualified teachers are the most important component of a child's education. However, agricultural education is wrestling with problems as a result of the teacher shortage. Kantrovich (2007) projected a 38 % deficit of qualified agriculture teachers nationwide for the fall 2007 semester, a phenomenon that is not new. In fact, this concern has been expressed in the profession's supply and demand reports spanning over 40 years (Roberts & Dyer, 2004). The variability of the agriculture teacher career description (Greiman, Walker, & Birkenholz, 2005; Mundt & Connors, 1999; Walker, Garton, & Kitchel, 2004) is believed to place additional pressure on new teachers. Researchers found the less attention paid to beginning teachers early in their careers, the less likely they were to return for another year (Greiman et al., 2005). With a high rate of teacher turnover and a number of retirements looming in the immediate future, the profession cannot afford to lose teachers in these early stages (Boone & Boone, 2007; Smith & Ingersoll, 2004).

Literature Review

One of the key factors indicated in the literature that contributes to teacher burnout is stress (Chan, 1998). Teacher stress occurs when teachers have interactions with others or among their daily work environment which they perceive to be emotionally, physically, or psychologically taxing to the extent that teachers lack the personal or physical coping resources, thereby resulting in disruptions of their daily routines (Lazarus & Folkman, 1984). Teachers experience a number of career related stressors including: working with unmotivated students, classroom discipline, workload and time demands, poor working conditions, challenging relationships with colleagues and administrators, among other factors (Kyriacou, 2001).

Kyriacou (2001) stated that workload demands can be a source of teacher stress. Cole (1981) reported average work weeks of between 45 and 65 hours for agricultural education instructors. Nelson and O'Brien (1993) report that "teachers in the United States devote more hours to instruction and supervision of students each week and have longer required workweeks than in any other country, including the nations with six-day weeks, such as Japan and Switzerland" (p. 75). This finding was supported by recent quantitative findings within agricultural education (Torres et al., 2008). Secondary agriculture teachers face even greater job demands than non-career and technical education teacher as they often work well beyond a 40-hour work week to supervise student projects, coach career development teams, evaluate student work and prepare lessons (Croom, 2003; Straquadine, 1990).

The trend of increasing job responsibilities in agricultural education is well documented in the literature (Delnero & Montgomery, 2001). One early observation cited by the National Research Council (1988) was that secondary agriculture teachers spend a great deal of time helping students excel in production-oriented FFA competitive events and award programs and less time on classroom instruction. Trends in recent years show more, not less, has been added to the job responsibilities in agricultural education. Moore and Camp (1979) found that long hours were the primary reason given by teachers for leaving teaching. While most teachers agree that teaching is rewarding, it is a difficult career because of the lack of resources, too much paperwork, crowded classrooms, students with emotional problems, low salary, and the pressure of high-stakes standardized testing (Strauss, 2007). Peiter, Terry, and Cartmell (2003) found that many first-year agricultural educators experience problems during their first year of teaching. Research by Torres et al. (2008) indicated that the hours a teacher spent at work was the greatest predictor of high teacher stress. This same study showed that teachers with less experience were spending more hours at work and experiencing high levels of stress. Thus, theoretically, this study was framed particularly around the external sources of teacher stress and micro and macro level factors influencing stress which could ultimately lead to teacher burnout.

Conceptual Framework

The conceptual framework for this study was a model of teacher stress developed by Montgomery and Rupp (2005) in a meta-analysis of 65 studies on the causes and effects of teacher stress, and adapted for the purposes of this particular study. In this model, the teacher experiences stress through a series of external events. They develop either positive or negative coping mechanisms, elicit an emotional response to the stressors and then depending on their coping abilities, burn out of the profession as a result (see Figure 1). In this model, the environment in which the teacher works, levels of personal support, and personality factors all serve as macro-level constructs that shape the ways in which teachers will react to external stressors. At the heart of the model, external factors such as student behavior, the structure of the school, workload, colleagues, administration, and personal life all serve as potential sources of teacher stress. In this particular study, given that teacher stress is linked to disruptions on the daily routine which can ultimately lead to burnout depending upon individual coping strategies, the ways in which teachers spend their time and the particular external stressors that can detract from that time or daily routine were of focus in the study.

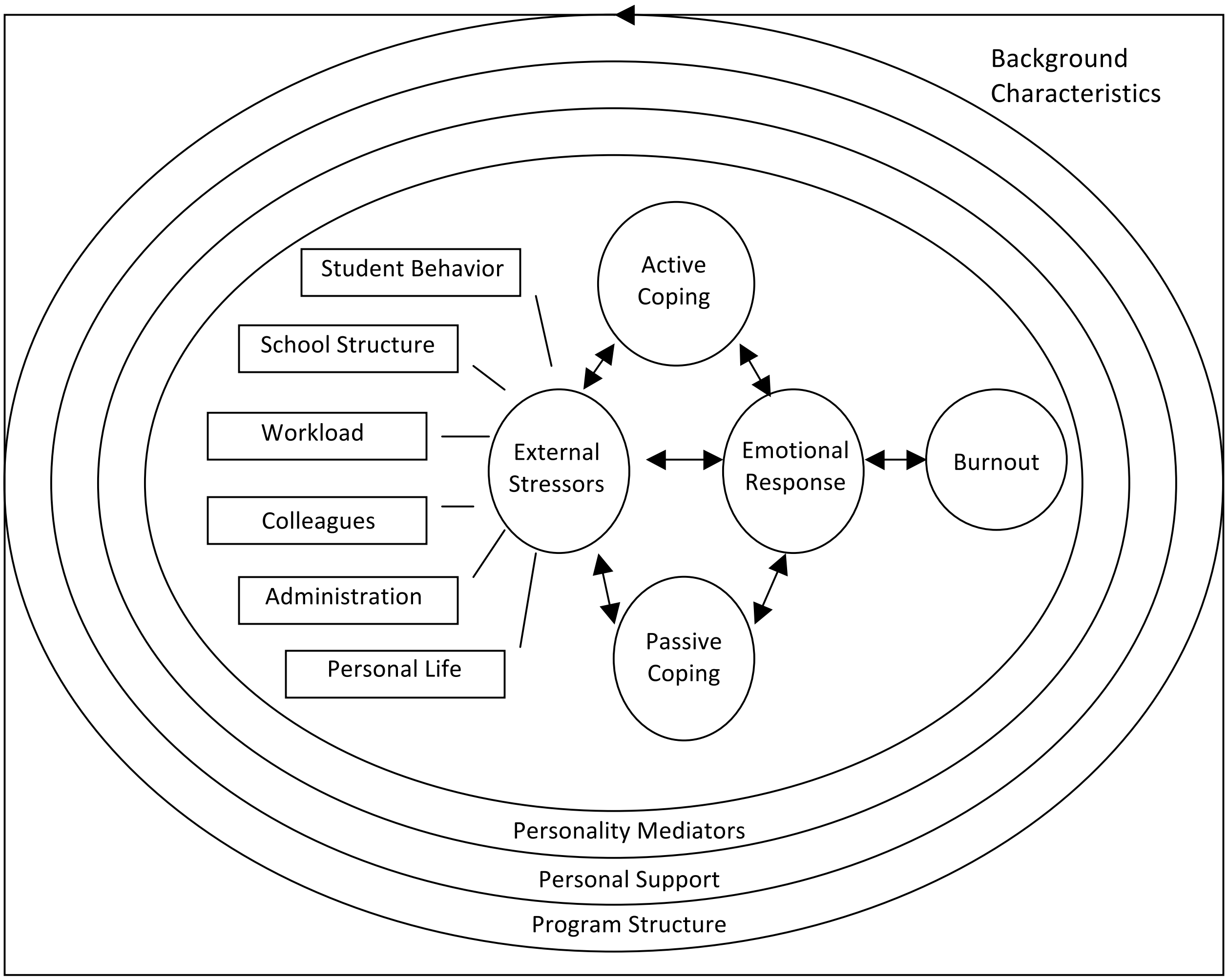

Figure 1. Theoretical-empirical model of construct relationships of teacher stress. Adapted from Montgomery & Rupp (2005)

Quantitative data has been collected on agriculture teachers that would reflect how they perceive spending their time. Torres, Ulmer, and Aschenbrener (2007) conducted a study using document analysis on a weekly journal where agriculture teachers self-reported using 13 pre-defined categories of time usage. The study included student teachers, new teachers (first year) and experienced teachers (more than 3 years). Such approaches generate interesting questions to consider from a research methodology standpoint. Would the results of this study be different if the teachers were not self-reporting their time allocation? Would the results be different if the teachers' time did not have to fit into one of these pre-determined categories? This study is different from the current literature base on agriculture teachers because it attempts to quantify their daily activities not through an instrument or through self-reporting, but from the viewpoint of gaining a deeper understanding of the meaning early career agriculture teachers ascribe to their time, and how external stressors impact their time. This is critical for understanding the workload of early career teachers. We know that large investments of time lead to stress at work, which could ultimately lead to burnout.

Purpose and Objectives

The purpose of this phenomenological study was to investigate the meaning early career agriculture teachers ascribe to their time. Early career agriculture teacher was defined as a full-time employee in high school agricultural education with six years or less of experience on the job. The objectives were: (1) How does an early career teacher spend their time; (2) What statements characterize the phenomenon of time for early career teachers; and, (3) What is the intersection of stress and time for early career teachers of agriculture?

Methods and Procedures

This was a phenomenological study. Phenomenology is a qualitative research method used to describe "the meaning of the lived experiences for several individuals about a concept or the phenomenon" (Creswell, 1998, p. 51).

Participants

The size of qualitative studies are usually quite small, averaging between one and 20 participants (Creswell, 1998). Using criterion sampling, seven different early career teachers were selected as the focus of the study. Criterion-based selection techniques, in particular, involves determining participants based on the goal of the study and consequently, works well with phenomenological studies (Creswell, 1998). The participants were selected because they each met the selection criteria as teachers with six years, or less, of experience at the secondary agriculture level. This criterion was chosen because Missouri teachers can first attain tenure at the beginning of their sixth year in the profession. Qualitative researchers make use of non-probabilistic sampling procedures to focus the study from its inception, identifying cases demonstrating the specific characteristics of interest (Patton, 2002). Permission was granted through the individual and the Institutional Review Board.

Procedures

Data were collected through semi-structured interviews. Questions were planned ahead of time based on the central questions being investigated and aimed to capture the typical school day, weekends, summer, vacations, and social time as well as planning, departmental workload balance, and how teachers describe their own time. Specific questions were also asked to understand how the organization impacted their time. The interviews lasted approximately 40 minutes per teacher.

Bracketing

Objectivity and confirmability were established by attempting to bracket the experiences and biases of the researchers that could have potentially influenced the interpretation of the results. The researchers are all former high school teachers and are all presently involved in teacher education. One researcher taught in North Carolina while another was a teacher in Missouri. These experiences influenced how they observed, interacted with, and received responses from an agriculture teacher, but every attempt was made to minimize this influence by triangulating data and being aware of these possible influences.

Data Analysis

The coding process began with a review and re-read of all collected data. The next step was an attempt at open coding where each transcript was reviewed for possible themes or connections to the phenomenon of interest. Those themes were compiled and analyzed for overlapping information. The researchers performed the coding individually, then confirmed as a group. At this point, themes were combined, creating five over-arching themes of teachers and their time. Quotes were selected which supported each theme.

Trustworthiness

Qualitative researchers use measures of validation formed from the credibility, transferability, dependability, and confirmability achieved through the methods (Lincoln & Guba, 1985). Credibility relates to the level of confidence in the researcher design and findings, to accurately represent and interpret the data (Ary, Jacobs, Razavieh, & Sorensen, 2006). Triangulation is an option making use of various sources, methods, investigators, and theories in the hope of providing evidence to back up emerging themes as well as identifying any inconsistencies in the data (Creswell, 1998). Credibility of the data was established through the use of a semi-structured interview protocol and by choosing an interviewer with as little personal connection to the subjects as possible. Following the interviews, the primary data were transcribed from the digital audio recordings (Kvale, 1996). According to Kvale, transcripts are translations of the lived interview experience into the text format and are interpreted differently as a result. Therefore, transcripts were submitted to participants to allow them to check for the accuracy of statements. Member checks were also performed on the themes that were seen in the data to confirm.

Participants

Seven teachers participated in the study. The first was in the spring of her first year of teaching. She was a single, traditionally trained teacher in a two-teacher department at a large, comprehensive high school in North Carolina. The next teacher was a single, traditionally-trained teacher in August of her second year as a teacher at a career center for a large, urban/suburban area of Missouri. She was in a multi-teacher department. The third teacher in the study was beginning his third year teaching in a two-teacher department in Missouri. He was traditionally certified in a teacher education program. The fourth subject was a married male teacher in his third year teaching in a single-teacher department in a small Missouri community. The next participant was a fourth year teacher at a rural town in southern Missouri. She worked in a two teacher department in a high school where enrollment was about 400 students. She was a parent of a young child. The sixth teacher in this study was in the middle of his fifth year in a two teacher, comprehensive agriculture program in North Carolina. He was traditionally certified teacher in a recently committed relationship. The last teacher in the study was just beginning her sixth year as a teacher in a rural Missouri school district. She was an agriculture student in high school and was working in a multi-teacher program with a lateral entry teacher as a teaching partner. She was married and the mother of a young child.

Limitations of the study

While qualitative research by purpose and design focuses on a smaller number of participants in greater depth, it is important to note that this study is limited in scope. While potentially transferable to other settings, the findings from this study are limited to the context of the seven individuals across two states who participated. Qualitative research is not intended to be generalized, and the findings should not be interpreted beyond the scope of the participants in this study.

Findings / Results

The first objective was to characterize how an early career teacher spends their time. For this objective, the theme of patterns emerged.

The day consists of patterns that vary depending upon the time of the year

From both the early observations as well as the interviews it became apparent that there were consistent patterns to not only the way the teacher operated within the scheduled class period, but also to how they moved through the day (see Table 1). Further investigation showed that teachers had a pattern in mind for the way the year would operate and could talk about what they would be doing months ahead. When asked to talk about a typical day, teachers could describe a pattern they see on a daily basis.

The pattern these early career agriculture teachers find in their time seems to vary depending upon whether the teacher is in an academic year, summer, or school breaks. It also seems to vary depending upon what FFA events are occurring. When asked about the hours per week the teachers worked, it was difficult to get a response. This time was dependent upon the non-instructional time events of the day. Many teachers seemed to break the year down by which CDE was occupying the time outside of school. When questioned about summer, there seemed to be an understood pattern because the teachers began listing events and time frames without pausing or checking a date book.

Table 1 - *Sub-themes seen within the teachers' patterns*

Pattern sub-themes	Quotations from Participants
Pattern to Class Period	"Typically start the day out with…a journal everyday… announcements everyday about what's going on…. I review a little bit or quiz …then move on to new stuff. And, I try to mix up the note taking with some sort of activity."[a]
Pattern to School Day	"School at 6:15. Get stuff together for the day. Work on whatever students have dropped off. Get stuff together for…after school. Teach three periods. Go to meetings. After school I practice some CDE

	team… Work with greenhouse and animals. Go home around 6 or 7."[f]
Pattern to School Year	"I can pretty much tell you based on last year … what's coming up and what I am going to spend my time doing for the next three weeks."[b]
Pattern to Summer	"Before state convention it's … practicing for teams during the day … and, then state convention… camp… and, then leadership school, then about the middle of July… SAE visits [are] all we do."[f]
Pattern guided by FFA/CDEs	"Last fall I did dairy judging…then this semester I had a junior ag sales team and … Farm Business team… I am doing a livestock judging team right now." [a]
Pattern is Seasonal	"Spring is more … hands-on and the fall is more …classroom."[d] "In the fall, the majority of my time goes just into classroom instruction. Now in the springtime … I would say a majority of my day goes to state degrees, proficiencies, contests."[c]
Pattern is Influenced by Non-instructional Events	"Think about fair week. That is way more than 70 hours. Think about national convention. Preparing for that is way more than 70 hours."[f]

[a]1st year; [b]2nd year; [c]3rd year, multi-teacher; [d]3rd year, single teacher; [e]4th year; [f]5th year; [g]6th year

The second objective sought to describe the phenomenon of teacher time as characterized by early career teachers. For this objective, two major themes emerged regarding the allocation of work time as well as the adaptation and evolution of time as described by early career teachers.

There is a conscious allocation of work time

These early career teachers seemed to have recognized when they work best as well as what time they will not give up for school work (see Table 2). Some have decided to work all seven days at school as part of their routine. Making this decision to work at school every day has allowed them not to take work home while other teachers do. One teacher stated "You do what you can do and you make it work" while also saying "I don't like to brag on myself but you know I do spend many hours at school". However, it was very telling that more than one teacher stated "I am really only at home to sleep."

Table 2 - *Allocations of work time*

	Yes	***No***
Working on Weekends	"Sometimes I take it home and I never touch it 'cause I just don't want to…this weekend, I will be grading SAE books at home all weekend."[a]	"I have to have some me time to get away from here and my weekends are for that."[g]

	"I have to feed the animals every day on the weekend."[a]	
Working at Home	"During the weeknights…I have a computer at home and I would much rather go home, sit there and do my PowerPoints than … sit at school until 10:00 doing them."[b] "I am going to have to find a happy medium…because I am finding myself getting a day late and a dollar short…in the classroom…so I am going to try to do that at my home."[g]	"Since I am home very little I try to take as little home as possible…I am…showing up maybe just 30 minutes earlier or something in the morning and try to do maybe grading of papers then and or just doing whatever I need to do whether its new PowerPoints or something like that in the morning."[d]
Downtime at school	"Take a mental break… and you just have to step back and count to 10, whether it's between classes … I try to do my best every single period whether it is in class or between classes or whatever to have a moment where at some point we are laughing about something."[f]	"I try to utilize every minute that I have, even in between classes…I try to get in a phone call or return a couple emails."[g] "You never will find me just sitting and staring out into space while students work on a project…I utilize that time to get other things done."[g]

[a]1st year; [b]2nd year; [c]3rd year, multi-teacher; [d]3rd year, single teacher; [e]4th year; [f]5th year; [g]6th year

The process of managing time adapts and evolves over time

The teachers in the study all talked about how the time they spend on the job has evolved. Those in the first and second years talked about living day-to-day while the teachers in years three through six could recall how difficult the earliest years were. As the teachers advanced in their careers, they talked about how planning for instruction had become easier and less time consuming. However, they noted they were not necessarily spending less time at work. Teachers were simply re-allocating that instructional planning time to FFA and SAE events (see Table 3).

Table 3 – *Sub-themes from the evolution of time*

Sub-themes	Teacher Quotations
The earliest years are hardest	"My first year first semester… I don't know if I left here before 10 for the first two or three months and I was here at 6am, you could set your clock by that."[f] "Well, this semester is a lot easier than last semester….last semester was my first semester… and I had three preps… it was a day to day thing. Like, during third period I was getting ready for 4th."[a] "My first year teaching…I would come in at 6:30 to 6:45 in the morning

	and… I would sometimes stay until 9 or 10:00 at night. I was not married. I lived 20 minutes away from school."[g]
	"First year to two years was spent primarily doing that kinda paperwork and … getting familiar with the curriculum…then… I didn't have to worry so much about the curriculum because I was teaching classes I was very familiar with already after having done it for 3 years."[g]
Planning gets easier	"… I would say I am spending the least amount of time that I have spent at school during my career so far. Last year…I was still staying until 5:00 or 5:30. I would get to school about 7:00 and I would stay until 5:00 or 5:30 and, of course, this year … I don't get to school until 7:30 and I have to leave by 4:20 … because of my family commitments."[g]
	"I think I am getting a little faster knowing what needs to happen and getting it done earlier."[b]
FFA fills the time space when planning efficiency improves	"And then somehow you still manage to fill that time with something else like I don't spend it planning but we seem to be doing 16 more FFA things you know so you are doing that instead but I just lessen the time I spend planning and just spend it doing other things."[b]

[a]1st year; [b]2nd year; [c]3rd year, multi-teacher; [d]3rd year, single teacher; [e]4th year; [f]5th year; [g]6th year

Objective three sought to describe the intersection of stress and time for early career teachers of agriculture. Two themes emerged for this objective as outlined below regarding the weaving of personal time with work, and tensions regarding how teachers spend their time.

Personal and social time for the teacher is woven into or around work

It seemed that even when talking about social or personal time, school was factored into the decision. The thoughts might have involved how the social time affects school or how school is creating a lack of social time, but the two seemed to be inexplicably tied. Even though their time seems to be arranged around the school schedule, teachers agreed that it was necessary to find social and personal time, either as a vacation, or after school, on the weekends, or even in some smaller way during the actual school day. Many teachers talked about how their family was being impacted by, or making an impact upon, their role as an agriculture teacher (see Table 4).

Table 4 - *Sub-themes regarding personal and social time*

Sub-themes	Teacher Quotations
School affects social time	"I have found out as Ag teachers there is always something to do and whether it is to fix the welder or whether it is to grade papers or whatever put grades in the computer, I think there are times when I just say well you know it's 6:00 I am going to take the wife out for dinner tonight or something so I think you have to be smart with it to just say tonight is me

	time."[d]
	"[Work] stuff is always in the back of your head."[f]
School affects family/relationships	"My husband and I have had a long discussion about this because we have to find that happy balance, the happy medium."[g]
	"We look around and consider to be some of the best Ag teachers you know in the state…we also see that a lot of times their family life did not go so well. They spent a lot of time at school probably and lost their wives in the deal and I know several Ag teachers that have been divorced."[d]
Relationships blur with school time	"I… involve the wife and she goes to a lot of places with us...She'll come up and she'll like train the Ag sales team…. She'll go on … officer retreat with us where I need a female chaperone."[d]
	"I am getting married this summer. It will be the first week that I have taken an entire week and not come to school and not done anything related to my job…I think it is going to be real positive because … it's gonna sorta give us a third ag teacher that is a female."
School affects vacations	"I take a weekend trip to the beach, but that doesn't happen in the spring time. I can do that in the summer. I can do it …in the fall, if we aren't training for nationals. I do a lot at Christmastime." [f]
	"I don't know that I would ever be able to use an entire months' vacation in the summer."[b]

[a]1st year; [b]2nd year; [c]3rd year, multi-teacher; [d]3rd year, single teacher; [e]4th year; [f]5th year; [g]6th year

Beginning teachers experience tensions between how they would like to spend their time and how they actually spend their time

The teachers had ideas about how they would want to spend their time and this did not always coincide with how they were spending their time. The teachers were asked if there was a part of their job they would choose to do all day (and nothing else), what would that be? Five teachers answered they would want to only do the teaching part with one saying "If I could do something every day it would be... just teach the kids that wanted to be there." Two teachers answered they would only do the FFA part of the job with one stating, "the whole reason I became an ag teacher was for FFA stuff and that is what I love to do." Additional items came up that teachers indicated they wanted to be doing while they seemed pulled into another direction (see Table 5).

Table 5 - *Sub-themes within tensions of time theme*

What teachers wanted to be doing	What teachers said they were doing

Teaching	"You have to spend an hour in the office talking with this kid and their parent or whether it's just a silly piece of paperwork that seems to take forever to fill out… people that just seem to take your time up …or it's the principal coming down and saying "hey … we need you to do this." [d]
FFA	"Fill out this paper, this kid needs a pass, you need to write a discipline slip on this kid, you need to fill out this paperwork to go on this trip, you need this for this."[d]
Planning	"My…plan period which is … not used for planning. I usually try to return phone calls, and chat with my teaching partner about issues related to the FFA chapter and because I have … a child, I have to leave school by 4:00."[g]
Saying No	"We are so competitive and we want to be so involved that we just keep piling those things on and …I know that it is not good for me, but in my mind I rationalize it saying that it is going to be good for the kids or that it's giving them an opportunity."[g]
Getting it all done	"A lot of times I don't get done what I wanted to [because I am] interrupted in class a lot of times."[d]

[a] 1st year; [b] 2nd year; [c] 3rd year, multi-teacher; [d] 3rd year, single teacher; [e] 4th year; [f] 5th year; [g] 6th year

Conclusions/ Recommendations/ Implications

Time is a scarce resource among these early career teachers; however, these early career teachers talk about time in a hopeful, yet accepting, way. They accept a heavy workload as part of the job. The teachers hope they will get better at managing their time and acknowledge that during their tenure thus far, instructional planning has improved each semester. They agree that the job is a twelve month position. They acknowledge that having greenhouses and livestock on campus affords them teaching opportunities that they might not otherwise have and are willing to trade some time every weekend to maintain this opportunity. All of the teachers in this study reported working well over a 40 hour work week, every week. This is consistent with prior research (Croom, 2003; Straquadine, 1990; Nelson & O'Brien, 1993; Torres et al., 2008). These findings imply that workload and time management could be a major source of teacher stress and ultimately lead to burnout as indicated by Moore and Camp (1979). It is recommended that further quantitative research be conducted to examine the ways in which teachers cope with the workload stress. Further research could compare early to more seasoned teachers regarding time management and coping strategies. Further, it is recommended that a similar qualitative inquiry be conducted to examine the notion of teacher time on a deeper level with more experienced teachers to determine if teachers conceptualize time differently as experience increases.

A further conclusion from the findings of this study was that time for teachers is consciously allocated and patterned, and even woven into their own personal down time. This is consistent with the conceptual framework, suggesting that teacher workload, school structure, and personal life are all micro-level external stressors in the teacher's schedule and teachers have developed coping mechanisms to deal with these stressors. The days and years tended to run in patterns, but teachers were always anticipating the unexpected that goes against those plans. Further, teachers expressed a lack of down time during the pattern of the workday, consistent with teachers telling of their allocation, management, and lack of time. Teachers mentioned that, in order to accomplish all of the work required of them in one day, they were multi-tasking in class, working during passing periods, working through lunch breaks, and working their entire planning periods. This finding was a bit different from the literature that indicated teachers are working many hours (Torres et al., 2007) in that it highlighted the conscious patterning of time and illustrated a true absence of down time for teachers.

While this can be viewed as a positive and a potential testament to their productivity and time management, the implication of this finding is that an absence of "down time" leaves little time for coping, reflection on teaching, or even time to regenerate and regroup. It is recommended that teachers should figure out times that are most productive and adjust their schedule to accommodate, while leaving downtime and time to reflect and rejuvenate within a day. Individuals who can find their true work rhythm and work within the times they are productive might accomplish the same tasks with less time and energy. Are these teachers forcing themselves to work against their natural work tendencies? Further quantitative studies should be conducted on the impact of lack of down time on how teachers reflect and think on and about their teaching practice.

A third conclusion from this study is that while time and the use of time is an evolving process as one progresses in years of teaching, the work-load increases to fill up available time. The implication of this finding is that teachers, while becoming more efficient and effective in planning and other management activities and thereby saving time, are not getting that saved time back because they then fill the found time with more activities. Further quantitative studies should be conducted comparing the amount of time teachers spend working in a typical week (on all work-related activities) and compare student learning and FFA outcomes between teachers who work differing numbers of hours during the week. In short, does it truly make a difference in regard to student outcomes if a teacher is working 80 hour work weeks, and why do teachers wear extended time at work as a badge of honor?

Finally, it was concluded that teachers experience external stressors that create tensions between how they spend their time and how they would like to spend their time, thereby changing how they work and what they do or do not accomplish. The teachers in this study reported that they would prefer to spend their time teaching, going to FFA activities, and managing a program as opposed to dealing with parent or administrative problems or paperwork. This finding is consistent with previous research on teacher stress (Montgomery & Rupp, 2005) that identified student problems, administrators, and workload as particular external stressors that shape and change how teachers spend their time. This finding supports the conceptual model that external stressors elicit an emotional response from teachers, thus creating tensions that may lead to teacher burnout. Additionally, the model suggests that coping strategies and emotional responses are not set and may change over time, and individual teachers will cope with specific micro-level stressors in a unique manner. Is it possible that veteran teachers have found ways to adjust their coping mechanisms to reduce the possibility of burnout? It is recommended that further quantitative studies be conducted regarding comparisons between how teachers would like to spend their time and how they currently spend their time and its impact on teacher motivation, teaching effectiveness, and teacher attrition.

This study was the beginning of an investigation of the phenomenon of teacher time, workload and stress. It can serve as a starting point for individuals engaged in teacher development to further provide mechanisms to help teachers manage time. Further investigations should evolve this notion of teacher time and explore the exact nature of coping and stress as it leads to burnout among agriculture teachers to ensure that the profession is able to retain a number of high quality, successful teachers for future generations.

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Balancing Act: How Agricultural Teachers Meet Career and Family Responsibilities

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Abstract

Research has shown that agricultural education graduates are hesitant to enter the profession and seemingly quick to leave. As the shortage of agricultural teachers continues and the number of female agricultural teachers rises, there is concern over the balance of career and family and its effect on the profession. The purpose of this study was to examine the issue of career and family balance for Georgia agricultural teachers by gender. The study was conducted as a census of all Georgia agricultural teachers on an extended day/extended year contract via an online survey. This study found that Georgia agricultural teachers were spending an average of 57 hours per week in their career and 20+ hours per week with family or household responsibilities. One-third of Georgia agricultural teachers felt that it was always difficult or impossible to balance career and family.

Introduction

The three components of a complete agricultural education program include classroom and laboratory instruction, supervised agricultural experience (SAE) programs, and FFA activities (Phipps, Osborne, Dyer, & Ball, 2008). The time required for teachers to establish a complete agricultural education program typically involves longer than a forty hour work week. Studies done by educational researchers have reported that agricultural teachers work an average of 55 hours per week (Cooper & Nelson, 1981). Those agricultural teachers who left the field have noted that the expectations, demands, and student opportunities only get added, with nothing ever being removed (Knight & Bender, 1978). The workload often begins to wear on agricultural teachers and many are choosing to leave the profession, while some are not entering the profession for fear of overly demanding job expectations (Osborne, 1992). From 1977 to 2006, the trend has been a consistent shortage of agricultural teachers in America (Kantrovich, 2007). Although teacher education departments are preparing the students, many prospective agricultural teachers are choosing not to enter the field; while some enter and remain three years or less (Osborne, 1992).

In studies on why agricultural teachers are leaving the profession, one of the most common answers is related to time and long hours (Froehlich, 1966; Mattox, 1974; Knight & Bender, 1978). Even if an agricultural teacher does love the job, if they are dissatisfied enough with an area of their job for long enough, the chances of them staying in the field greatly decreases (Walker, Garton, & Kitchel, 2004). Osborne (1992) found that the agricultural education profession “literally devours its young” (p.3) due to the heavy workload, high stress level, and excessive job expectations that eventually force agricultural teachers to leave the profession in order to find personal and professional satisfaction.

The idea of balance is a central issue in our profession (Crutchfield, 2009) and there is little doubt that handling an effective agricultural program as well as family commitments can be a delicate balance (Niehaus, 2008). When an agricultural teacher is single, or without children, they have more choice over how they spend their time. In the agricultural education profession, this often means choosing to spend it at school working on FFA competitions, SAE projects, or lesson plans. When a family is involved, time spent at school and with FFA activities is time spent away from the family (Lawver, 2007). Balancing the classroom, FFA/SAE, and family responsibilities has been a longtime issue for dedicated agricultural teachers (Buehler, 2009). Coughlin, Lawrence, Gartin, and Templeton (1988) found that spouses felt that “successful” agricultural programs required a time commitment that required teachers to spend excess hours away from their home and family. Teaching agriculture is often seen as a lifestyle rather than just a career and this can often make it difficult to draw the line and head home (Buehler, 2009). Spending numerous nights a week apart from one’s spouse, children, and friends often results in burnout and a high teacher turnover (Osborne, 1992).

Cooper and Nelson (1981) found that spouse and family factors within the agricultural education profession play a significant role in teacher turnover, teacher shortage, morale issues, and even to the quality of programs in some situations. If changes are not made in the profession to encourage and enable balance between agricultural education responsibilities and family commitments, the profession will continue to pay the price of teacher shortages and high teacher turnover (Cooper & Nelson, 1981; Osborne, 1992).

Foster (2001b) commented that the issue of balancing career and family is not one that is specific only to agricultural education, but it does appear that society expects women to be able to maintain a “traditional” family role and a “successful” agricultural program. Female agricultural teachers in Foster’s study made several comments regarding the issue of balancing a “normal” home and a competitive or successful agricultural program. Many expressed guilt associated with time spent away from home or concerns over never starting a family due to what it might mean to their career. According to Buehler (2008), Foster states that educators who leave the profession to start a family rarely return to their jobs. Consequently, the profession is losing women by not helping them find ways to stay or to return (Buehler, 2008). Kantrovich (2007) reported that 27% of the current agricultural teachers nationwide are female, with 52% of newly qualified potential teachers being females. With a continually increasing number of female agricultural education graduates and a continued struggle between maintaining a home life and a successful career, the issue of career and family balance becomes even more prevalent for our female agricultural educators.

Theoretical Framework

The theoretical framework associated with this study is the concept of a spillover effect, whether positive or negative, between family and work. For this study spillover was defined as “the ways in which family life [or work life] affects an individual's energy level, attention span, and mood that, in turn, are brought into the work setting [or family setting] by the worker [or individual]” (Crouter, 1984, p. 438). The spillover theory transfers into the life of an agricultural teacher by realizing that if the agricultural teacher is distracted or frustrated with the lack of time with their family, then these emotions carry over into their work life. Conversely, if the agricultural teacher is satisfied with their job, this attitude follows them into their family life. However, even if the agricultural teacher loves their job, the amount of time required by it impacts their ability to be involved and derive satisfaction from their family. Also, no matter how much the agricultural teacher enjoys spending time with their family, the daily responsibilities of caring for a family and maintaining a household detracts from their time and productivity at work. The ability of an agricultural teacher to balance family and professional life depends on their responsibilities in both and their ability to limit the effect from one area to another.

Research Objectives

The purpose of this study was to explore the career and family expectations of Georgia agricultural teachers by gender as well as to identify challenges of agricultural teachers in balancing career and family. The following research objectives were addressed in the study:

1. Describe the perceived job expectations of Georgia agricultural teachers by gender.
2. Describe the time commitment related to home and family responsibilities by gender.
3. Describe the perceptions of agricultural teachers and spouses regarding their ability to balance career and family life by gender.

Methods

The research design of this study was descriptive explanatory. The study used survey research methodology to describe the perceptions of Georgia agricultural teachers regarding their job expectations and family responsibilities, as well as perceptions of their ability to balance job expectations and family responsibilities based on their gender.

The population for this study consisted of all extended day/extended year Georgia agricultural teachers at the middle or high school level during the 2009-2010 school year (N=303). Extended day/extended year agricultural teachers in Georgia are paid to work an extra hour each day along with extra days during the summer, ranging from 15-40 days depending on the contract. The frame used to determine the population was the 2009-2010 Georgia Agricultural Teacher Directory provided by the State Curriculum Coordinator. A list of contract lengths for Georgia agricultural teachers was also provided by the State Curriculum Coordinator and teachers who were not on an extended day/extended year contract were removed from the population since their perception of balancing career and family would not be the same as those required to work additional hours. Due to the use of an emailed survey through SurveyMonkey, there was no need to take a sample. A census of all Georgia agricultural teachers was the most effective way to represent the population. Fifteen teachers opted out of the survey, or had undeliverable email addresses, and one teacher stopped teaching in the process of collecting the survey, so the final accessible population was N=287.

The instrument contained thirty-one questions developed by the researcher. It was reviewed by a panel of experts to determine content validity. A pilot study was conducted on eleven North Carolina agricultural teachers and reliability was determined using the test re-test approach. The instrument was then evaluated for significant differences between the first and second responses of the eleven teachers. No significant differences were found. Therefore, the instrument was determined to be stable over time.

The first section of the instrument included eight short answer or multiple choice questions regarding the teacher's agricultural education program. The next thirteen questions were in short answer, multiple choice, and Likert scale format and dealt with responsibilities, barriers, and challenges when balancing career and family for agricultural teachers. The last section contained nine demographic questions. The final question of the instrument was an open-ended question regarding any other information that should be considered in this study as it related to the ability to balance career and family for agricultural teachers in Georgia.

A cover letter, consent agreement, and survey instrument was emailed to each of the identified middle or high school teachers in the 2009-2010 Georgia Agricultural Teacher's Directory through SurveyMonkey. The email contained a link to the available survey in Survey Monkey. A follow up email and instrument were sent at 11 and 26 days after the original survey. Each subsequent email again explained the nature of the study, encouraged teachers to participate and included a link to the survey. Survey Monkey ensured that only individuals who had not completed the survey were sent reminder emails.

One hundred seventy one teachers responded to the instrument for a response rate of 59.6%. Non-response error was controlled for by calling 15% of the non-respondents and asking a selective sample of questions from the instrument to determine if there were any differences between respondents and non-respondents. The only difference found was that non-respondents were less likely to be between the ages of 22 and 30 and more likely to be between the ages of 31 and 50. Since there were no differences between respondents and non-respondents in their response to the questions related to the dependent variables, the respondents were considered to be representative of the entire population.

The data were analyzed using the Statistical Package for Social Sciences version 17.0. Population parameters were used to describe the data and included frequencies, percentages, means and standard deviations. A direct comparison of data for males and females was used to determine differences.

Findings

The population of Georgia agricultural teachers on extended day/extended year contracts was made up of 56% (n=95) male teachers and 44% (n=76) female teachers. When comparing males to females, females (61%) were twice as likely to be between the ages of 22 and 30 as were males (32%). This left twice as many males as females in every other age bracket. Over 70% of Georgia agricultural teachers were 40 years of age or younger.

Regarding years of teaching experience, there were a substantially higher percentage of females in the 0-5 year bracket than males, but the percentages teaching 6-10 and 11-15 years were comparable for males and females. The percentage of males who had taught 16+ years was approximately four times higher than the percentage of female teachers with the same number of years in the profession. Overall, exactly half of the Georgia agricultural teachers were in their first five years of teaching with two-thirds of Georgia agricultural teachers having taught 10 years or less.

The number of unmarried female agricultural teachers was double the number of unmarried male agricultural teachers, with 80% of males stating they were currently married and only 55% of females reporting being currently married. Almost 10% of females were divorced and not remarried, while all male agricultural teachers that had been divorced were also remarried, for a total of 5% divorced/remarried male agricultural teachers. Seventy-three percent of all Georgia agricultural teachers were currently married, and 7% had been divorced at some point.

When examining the number of children living at home, 64% of male agricultural teachers had children at home compared to 29% of female teachers. Of those teachers who did have children living at home, a substantial proportion (79%) had one or two children, with these percentages being fairly similar between males and females. Also, of those who had children living at home, females were twice as likely to use paid daycare or childcare services. Table 1 displays the demographic characteristics for Georgia agricultural teachers.

Table 1
Frequencies and Percentages of Demographic Characteristics of Georgia Agricultural Teachers

	Male			Female			Total		
	n	*f*	%	*n*	*f*	%	*N*	*f*	%
Gender		95	55.56		76	44.44		171	100.00
Age	92			72			164		
22-30		29	31.52		44	61.11		73	44.51
31-40		29	31.52		13	18.06		42	25.61
41-50		19	20.65		8	11.11		27	16.46
51-59		15	16.30		7	9.72		22	13.41
No. of Years Teaching	92			72			164		
0-5		35	38.04		47	65.28		82	50.00
6-10		16	17.39		12	16.67		28	17.07
11-15		15	16.30		8	11.11		23	14.02
16-20		12	13.04		2	2.78		14	8.54
21+		14	15.22		3	4.17		17	10.37
Marital Status	93			72			165		
Never Married		12	12.90		24	33.33		36	21.82
Married		75	80.65		40	55.56		115	69.70
Separated/Divorced		0	0.00		8	11.11		8	4.85
Divorced/Remarried		5	5.34		0	0.00		5	3.03
Widowed		1	1.08		0	0.00		1	0.61
No. of Children Living at Home	61			22			83		
1-2		47	77.05		19	86.36		66	79.51
3+		14	22.95		3	13.63		17	20.47
Use of Daycare	61			22			83		
Yes		22	36.07		15	68.18		37	44.58
No		39	63.93		7	31.82		46	55.42

When looking at the program characteristics of Georgia agricultural teachers, 39% of males taught in a one-teacher department compared to 57% of female agricultural teachers, with approximately half of the Georgia agricultural education programs being one-teacher departments.

The high percentage of females in a one-teacher program was not surprising considering that female agricultural teachers were three times more likely (22 females versus 8 males) to teach in a middle school (one-teacher) program than were male agricultural teachers. Eighty one percent of male agricultural teachers and 67% of females taught in a high school agricultural program.

Over half of the Georgia agricultural teachers on extended day/extended year contracts were on a 40 day or 12 month contract. A difference between the two genders was somewhat evident in the length of contracts. Females were approximately 15% more likely to have an extended year contract length of 30 days or less, while males were 17% more likely to have a full 40 day contract. This was understandable since more females were middle school teachers and middle schools were more likely to have an 11 month (or 20 day) contract than were high schools. Table 2 represents the program characteristics of Georgia agricultural teachers.

Table 2
Frequencies and Percentages of Program Characteristics of Georgia Agricultural Teachers

	Male			Female			Total		
	n	*f*	%	*n*	*f*	%	*N*	*f*	%
No. of Teachers/Dept.	92			72			164		
1		36	39.13		41	56.94		77	46.95
2		30	32.61		13	18.06		43	26.22
3		19	20.65		15	20.83		34	20.73
4		4	4.35		1	1.39		5	3.05
5		3	3.26		2	2.78		5	3.05
Type of Program	91			72			163		
Middle School		8	8.79		22	30.56		30	18.40
Junior High		1	1.10		0	0.00		1	0.61
Ninth Grade		1	1.10		1	1.39		2	1.22
High School		74	81.32		48	66.67		122	74.84
Other		7	7.69		1	1.39		8	4.91
Extended Year Contract	95			75			170		
15-30 Days		29	30.53		35	46.67		64	37.65
31-39 Days		9	9.47		8	10.67		17	10.00
40 Days		57	60.00		32	42.67		89	52.35

The first objective of this study was to describe the perceived job expectations of Georgia agricultural teachers by gender. To determine the job expectations of Georgia agricultural teachers, a list of potential weekly activities was provided to teachers to get a representation of hours spent in each area per week. Time spent involved with livestock projects and SAE visits were not included in these options, because they were addressed later in the survey instrument.

The amount of time Georgia agricultural teachers spent in classroom and lab instruction ranged from 20-40 hours per week with an average of 28 hours. Hours involved in class preparation varied from one to 35 hours per week with an average of nine hours of classroom preparation per week for both genders. Time spent each week in FFA activities ranged from one to 30 hours, with an average of nine hours per week spent on FFA activities for both genders. An average of almost two hours per week was spent in additional teaching responsibilities that were not listed as an option. These could include things such as school duties, meeting with parents, and livestock and/or SAE visits that teachers included in this part of the survey.

Both male and female agricultural teachers reported approximately the same number of hours spent each week in the total agricultural education program (Classroom, SAE, FFA) with an average of 57 hours per week being reported for all Georgia agricultural teachers. Table 3 displays time spent in various job expectations and in the total agricultural education program.

Table 3
Mean Hours Spent in the Total Agricultural Education Program each Week

	Male			Female			Total		
	n	*μ*	*σ*	*n*	*μ*	*σ*	*N*	*μ*	*σ*
Hours Per Week									
Classroom/Lab	76	27.99	5.25	49	28.64	6.65	125	28.25	5.82
Classroom/Lab Preparation	91	8.57	4.79	68	9.05	5.63	159	8.78	5.16
FFA Activities	90	8.80	5.11	69	9.89	7.36	159	9.27	6.19
Maintenance	90	2.91	2.85	69	2.81	2.03	159	2.87	2.52
Paperwork	89	2.20	1.84	69	2.69	2.86	158	2.41	2.35
Other	95	1.58	3.54	75	1.84	4.48	170	1.69	3.97
Hours in Total Program	76	57.31	9.81	52	56.42	8.03	128	56.95	9.11

When evaluating the amount of time spent in livestock show participation for Georgia agricultural teachers, three-fourths of male agricultural teachers and two-thirds of female agricultural teachers reported that students in their department exhibited livestock. While male agricultural teachers reported an average of 25 students compared to 16 students for female teachers, both genders reported attending an average of nine livestock shows each year, representing the same amount of time spent away from the classroom and family. Table 4 displays the mean livestock program participation for Georgia agricultural teachers.

Table 4
Mean Livestock Show Participation

	Male			Female			Total		
	n	*μ*	*σ*	*n*	*μ*	*σ*	*N*	*μ*	*σ*
No. of Students Exhibiting Livestock	71	25.11	36.91	50	15.92	13.19	121	21.31	29.77
No. of Single Day Livestock Shows	71	5.23	4.72	50	5.92	3.78	121	5.51	4.36
No. of Multiple Day Livestock Shows	71	4.10	3.50	50	3.92	2.66	121	4.02	3.17

Regarding how Georgia agricultural teachers conducted SAE visits, teachers were provided options of SAE visit tendencies and asked to check all that applied, so more than one answer per teacher was acceptable. Almost 90% of all teachers reported conducting SAE visits as needed or requested and one-third replied that they conducted SAE visits at concentrated times during the year (i.e. right before a livestock show or at the end of the semester prior to grading). Where male and female agricultural teachers differed was in conducting SAE visits on school holidays and during the summer, with male agricultural teachers being almost twice as likely as females to conduct SAE visits during those times. Table 5 displays how Georgia agricultural teachers conduct SAE visits.

Table 5
Frequency and Percentage of Teachers' SAE Visits

	Male (n=95)		Female (n=76)		Total (N=171)	
	f	%	f	%	f	%
Do Not Conduct	2	2.11	1	1.32	3	1.75
As Needed or Requested	84	88.42	65	85.53	149	87.13
On School Holidays	36	37.89	15	19.74	51	29.82
On a Schedule	21	22.11	11	14.47	32	18.71
During the Summer	23	24.21	9	11.84	32	18.71
Concentrated During Certain Times of the Year	33	34.74	23	30.26	56	32.75
Other	1	1.05	5	6.58	6	3.51

Teachers were also asked to indicate how frequently they conducted maintenance on facilities and asked to select all that applied. Males and females were very similar in how they scheduled facilities maintenance, with a large majority (80%) handling issues as needed, one-third saying they handled maintenance in the summer, and one-third on a routine or regular basis. Table 6 displays teachers' facilities maintenance routines.

Table 6
Frequency and Percentage of Teachers' Scheduling of Facilities Maintenance

	Male (n=95)		Female (n=76)		Total (N=171)	
	f	%	f	%	f	%
As Needed	76	80.00	61	80.26	137	80.12
In Summer	31	32.63	28	36.84	59	34.50
Routine or Regular Basis	37	38.95	25	32.89	62	36.26

The average summer contract length for all teachers was 32 days, with females averaging a 30 day contract and males averaging a 34 day contract. As a whole, male teachers reported working six days more in the summer than female teachers, which corresponded with the fact that males were on a longer extended year contract. The areas where male and female agricultural teachers displayed differences in summer employment were in the areas of SAE visits, CDE preparation, and the canning plant, with males working an average range of 2-4 more days in those areas than females. Overall, Georgia agricultural teachers spent an average of 11 days on FFA related activities, 12 days with SAE visits and livestock shows, 10 days in the canning plant or facilities maintenance, and six days participating in teacher in-service or other activities. Totaled, they worked an average of almost 39 days in the summer, which is seven days more than the length of the average contract. Table 7 displays the days worked in the summer for Georgia agricultural teachers.

Table 7
Mean Number of Days Worked in the Summer

	Male (*n*=91)		Female (*n*=73)		Total (*N*=164)	
	μ	σ	μ	σ	μ	σ
FFA Camp	3.42	2.31	4.18	1.90	3.76	2.16
Teacher In-service	5.73	2.14	4.92	2.20	5.37	2.19
SAE Visits	11.00	6.85	7.71	5.81	9.53	6.59
Officer Training/Leadership Retreats	3.18	2.11	3.55	2.12	3.34	2.12
CDE Preparation	4.27	6.25	2.79	3.15	3.61	5.15
Canning Plant	5.36	8.88	3.63	8.66	4.59	8.80
Livestock Shows	2.43	3.75	1.87	2.91	2.18	3.40
Washington Leadership Conference	0.34	1.40	0.78	2.00	0.54	1.70
Facilities Maintenance	5.41	4.37	5.47	3.93	5.43	4.17
Other	0.34	1.74	0.33	1.43	0.33	1.60

The second research objective was to describe the time commitment related to personal and family responsibilities by gender. Teachers reported commitments in the areas of grocery shopping, meal preparation, house cleaning, yard work, child care, laundry, farm work, home maintenance, child transportation, helping with homework, and other. When dealing with responsibilities related to home and family commitments, those teachers who were married and/or had children were asked to list what percentage of each home responsibility belonged to them. Both male and female agricultural teachers reported spending an average of 20 to 22 hours per week involved with family responsibilities. Table 8 displays hours spent involved in home and family commitments.

Table 8
Mean Time Spent in Home and Family Commitments

	Male			Female		
	n	μ	σ	*n*	μ	σ
Hours Given to Family Responsibilities Each Week	76	20.17	11.98	40	21.88	15.36

The third research objective was to describe the perceptions of agricultural teachers and spouses regarding their ability to balance career and family by gender. Regarding the agricultural teachers' perception of their ability to balance career and family, males and females were very similar with a majority (66%) of teachers who were married and/or had children reporting that they could almost always or usually balance and another 34% stating that it was always difficult or impossible to balance.

When evaluating the frequency of stress teachers experienced as they balanced career and family, approximately half of both genders reported occasional or monthly stress. Five percent of males said they had no stress balancing the two, while all females claimed experiencing some level of stress. Between weekly and daily stress, males were slightly more likely to experience weekly stress, while females were slightly more likely to experience daily stress.

Approximately 35% of all teachers said that their spouse would consider their ability to balance career and family as always difficult or impossible. Table 9 shows the agricultural teachers' perceptions of their ability to balance career and family as well as the agricultural teachers' view of their spouses' perception of their ability to balance career and family.

Table 9
Frequencies and Percentages of Perception of Balance and Stress Level

	Male			Female			Total		
	n	*f*	%	*n*	*f*	%	*N*	*f*	%
Teacher's Perceived Ability to Balance Career and Family	78			41			119		
Can Balance Almost Always		8	10.26		4	9.76		12	10.08
Can Usually Balance, but Difficult at Times		44	56.41		23	56.10		67	56.30
Always Difficult to Balance		23	29.49		13	31.71		36	30.25
Impossible to Balance		3	3.85		1	2.44		4	3.36
Teacher's Perceived Stress Level with Balancing Career and Family	78			42			120		
No Stress		4	5.13		0	0.00		4	3.33
Occasional Stress		18	23.08		11	26.19		29	24.17
Monthly Stress		19	24.36		11	26.19		30	25.0
Weekly Stress		19	24.36		5	11.90		24	20.0
Daily Stress		18	23.08		15	35.71		33	27.50
Spouse's Perception of Teacher's Ability to Balance Career and Family	77			40			117		
No Problem		7	9.09		5	12.50		12	10.26
Difficult at Times		45	58.44		19	47.50		64	54.70
Always a Struggle		22	28.57		14	35.00		36	30.77
Impossible		3	3.90		2	5.00		5	4.27

Conclusions

Based on the findings of this study, the following conclusions were drawn:

1. The number of hours both genders reported working each week and the number of days reported for summer employment were well over the 45 hours and 32 day average for which they received compensation.
2. Twenty plus hours per week spent in family responsibilities after a 57 hour work week was a demanding schedule for both genders of agricultural teachers.
3. The frequency with which both male and female agricultural teachers experienced difficulty in balancing career and family should be a concern to the profession.

Implications

The fact that agricultural teachers are consistently working 55+ hours per week, as reflected in this data and data reported by Cooper and Nelson (1981), implies that the demands of the job are more than what can be accomplished in a standard 40 hour work week. This also reflects the fact that these hours are hours not being spent with the agricultural teacher's family, which as shown above, is causing stress for agricultural teachers. This information also confirms Osborne's (1992) statement that the agricultural education profession "literally devours its young" (p.3) due to the heavy workload, high stress level, and excessive job expectations that eventually force agricultural teachers to leave the profession in order to find personal and professional satisfaction. The concern about career and family balance and the effect it has on satisfaction and retention in the agricultural education profession was an issue in 1992 and it remains an issue in 2010. One major difference between 1992 and 2010 is the increasing number of female agricultural teachers. The high percentage of female agricultural teachers combined with the reported difficulties and stress in balancing career and family for females leads to an increased level of concern.

The combination of 57 hours per week and 39 days in the summer, when only required to work 45 hours per week and an average of 32 days in the summer, is likely to result in teachers becoming overloaded and burnt out. Long hours have been shown to be a contributor to teachers leaving the field or to not entering the field (Froehlich, 1966; Knight & Bender, 1978; Lawver, 2007; Mattox, 1974). It is reasonable to assume that a schedule of this intensity may be affecting the number of Georgia agricultural education graduates who enter the field and those who leave the field. The fact that 67% of the teachers have taught less than 10 years and half have taught 5 years or less could be because they are not staying in the profession. Prior research points to the concept that an intense work schedule is certainly one of the contributing factors to teachers leaving the profession (Froehlich, 1966; Knight & Bender, 1978). Is the intense schedule a contributor to the lack of seasoned teachers?

Both genders of agricultural teachers reported a difficult time in balancing career and family. However, females are experiencing higher levels of stress in attempting to maintain the balance. This information is similar to that found by Knight's (1987) study on the current status of female vocational agricultural teachers and their perceptions of their place in the profession. Knight found that 43% of the females reported the same general difficulties as other vocational agricultural teachers, but 36% also reported concerns unique to women including the challenge of balancing household chores with professional demands.

Recommendations

Based on previous research that shows that agricultural teachers who find it too difficult to balance career and family will ultimately become dissatisfied and leave the profession, the following is recommended:

1. Pre-service teachers should be encouraged to set prior limits to activities in order to find balance. Advice should be given on how to set limits, so that burn out doesn't occur once in the field.
2. Time management workshops should be provided as part of teacher in-service. Providing it as an in-service allows those that are currently in need of time management skills to take advantage of the professional development.
3. A message of career and family balance should be sent from State and Regional Staff. Pressure to perform for State and Regional expectations leads agricultural teachers to feel over-burdened, so an encouragement from these departments to find a balance, while still completing the job, might enable some teachers to heed that advice.
4. Half-time positions should be created for agricultural teachers to provide options other than completely leaving the agricultural education profession.

Regarding future research, the following is recommended:

1. A five year and ten year follow up study should be conducted on Georgia agricultural teachers to observe any differences or similarities regarding career and family balance.
2. Similar studies in other states should be conducted in order to increase the generalizability of the findings in this study.
3. Further studies should be conducted to examine the difference in stress level between agricultural teachers with a spouse and/or children and those without.

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Perceptions and Barriers of Four Female Agricultural Educators Across Generations: A Qualitative Study

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Abstract

The purpose of this phenomenological study was to discover the perceptions and barriers of four female agriculture educators across generations in a non-traditional field of agriculture. The United States Department of Labor (2006) defined a non-traditional job as any occupation where one gender comprises 25% or less of the total employment. Four female agriculture teachers across three generations were interviewed with the open-ended question: "What have been your personal and professional experiences in teaching agricultural education?" The teachers selected were from three generations: early Baby Boomer (Vietnam Generation), late Baby Boomer (Me Generation), Generation Xer, and Millennial. Each participant had a Bachelor's degree in agricultural education and ethnicity was not taken into account when selecting participants. The themes revealed in the study were: qualifications to teach agriculture education, challenges in teaching agriculture education, stress in teaching agriculture education and stereotyping of agriculture education teachers.

Introduction

The United States Department of Labor (2006) defined a non-traditional job as any occupation where one gender comprises 25% or less of the total employment. Kantrovich (2007) revealed secondary female agriculture teachers comprise 27% of the agriculture education field. However, there is a 41% female student membership in high school FFA (National FFA, 2008) so why is there a discrepancy in the number of high school females taking agriculture and the low number females in the teaching field? There are several perceptions of why this is occurring. One possible answer could be barriers secondary female agriculture educators' face as they pursue a teaching career in the field of agriculture education.

Much of the literature reflected several of the perceptions female secondary agriculture teachers in the nation face. A national study conducted by Foster (2003) revealed three barriers or challenges experienced by participants were acceptance by parents and community; acceptance by peers (male teachers); and acceptance by administration and business leaders.

The problems women face in agriculture education are not unique. They are similar to problems facing women pursuing careers in other fields that are traditionally male dominated. The United States Department of Labor (2006) listed non-traditional jobs for women as detectives, architects, office machine repairers, construction and building inspectors, fire fighters, aircraft pilots, small engine mechanics, and agriculture education. Women face similar problems when pursuing careers in fields that are traditionally male dominated, for example, a woman obtaining her first job from a school administrator whom is accustomed to hiring men to teach agricultural education. Furthermore, many female agriculture teachers feel they must prove to their fellow teachers, students, parents, and administrators that they are capable of doing the job despite being female (Foster, 2001; Kelsey, 2007). There is an increase of female secondary agriculture educators, but research has shown women do not stay in the field of agriculture education for a long period of time(Castillo & Cano, 1999).

Research has provided documentation of why women leave the agriculture education teaching field and the barriers they have faced. Many of the perceived barriers and perceptions of secondary female agriculture teachers are from community members; criticisms from other teachers and administrators; sexual discrimination; sexual bias; job competency; and attitudes regarding a female agriculture instructor (Corn, 2000; Foster, 2001; Foster & Seevers, 2004; Kelsey, 2006; Kelsey, 2007). However, past research does not show us barriers faced by women agriculture educators across different generations.

Theoretical Framework

Western society views a feminist epistemology as a "…concept that claims to include *all people* but historically it has been an androcentric concept that represents a male perspective" (Thayer-Bacon, 2003, p. 16). Lather (1987) expanded the feminist belief "… the socially sanctioned power of men over women, operates in both the private and public spheres to perpetuate a social order that benefits men at the expense of women" (p.243). Therefore, feminist research is constantly changing and challenged by Western society and research for women should reflect a women's situation in society (Olesen, 2005). Research can not look at feminist research as only gender oriented; but class, race, economics, politics, and knowledge must be intertwined so portray an honest picture of how if effects the hierarchy of Western society (Alcoff &Potter, 1993; Olesen, 2005).

Women have been marginalized in Western society for centuries (Tyack & Hansot, 1992). In the private sphere, the female is dominant where her *voice* can be heard; but not in the public sphere, this is considered a male domain. Thayer-Bacon (2003) acknowledged female *voices* have been historically excluded from knowledge or knowers. Society has a male perspective and the male thinks logically while trying to control and contain their emotions. However, women are associated with emotions and intuition and this has created a gender split which maintains the male hierarchy in Western society (Thayer-Bacon). Thayer-Bacon revealed "…women still serve in the role of *Other* defined in contrast to rational males" (p.27). Therefore, how a women's *voice* is heard and acknowledged in Western society makes feminist research active and not passive.

Olesen (2005) pointed out there have been several studies in education regarding feminism. Many women in education struggle with the current political educational structures because of how the educational systems do not take into account the female *voice.* Lather (1987) revealed, historically, women teachers were an extension of their role in the home. They were to nurture and prepare children to go from the private to public sphere and "…to accept male leadership as "natural" and to provide services that reproduce males for jobs and careers, females for wives and mothers and a reserve labor force" (Lather, p. 245). With this type of social structure, "…women teachers serve as transmitters of cultural norms rather than cultural transformers…" (Lather, p. 245) and were perpetuating the male hierarchy.

As Western society continued to grow and change during the twentieth century, women began to change and question their value and *voice* (Lather, 1987). There appeared to be several contradictions for female teachers as to what role they were to play. Lather (1987) revealed women teachers are in a position of power and powerlessness. They have responsibility without power because the teaching system is and was based on male hierarchy. However, Western society has expected women teachers to perform miracles with children and to overcome society's intransigent problems (Lather).

During the 1960's and 1970's a change in social climate occurred. Tyack and Hansot (1992) revealed "…when feminists redefined women's grievances as a public issue rather than as a personal problem… sexual discrimination in schools became one of their prime targets" (p. 245). The women's movement in education sought to change the biased curriculum and a reduction of sex stereotyping educational courses (Tyack & Hansot, 1992).

With this movement underway in education, Title IX of the 1972 Education Amendment was passed. Title IX's purpose was to eliminate discrimination of gender, race, and economic groups. Title IX "…outlawed separate-sex classes in health, physical education, and vocational subjects as well as banning sex-segregated vocational programs and schools" (Tyack & Hansot, 1992, p. 256). Before Title IX, females were allowed to only enroll in traditional *female* vocational classes; such as, home economics and office-business training courses. Title IX allowed females to take the traditionally *male* shop classes. Therefore, the face of vocational education had to change. With that change, women entered the agriculture education field. This change happened as a direct result of Title IX and several other statues which prohibited sex discrimination in employment (Tyack & Hansot, 1992).

Within the male hierarchy of teaching it was difficult for female teachers to teach in a non-traditional field. Kincheloe and Steinberg (2002) noted if a female worked in a traditionally male oriented field then the skill or career became devalued. The male hierarchy in secondary agriculture education perceived females devaluing the integrity of their job and attempted to keep women from obtaining a career in agriculture education (Kelsey, 2007). Slowly, barriers blocking women from teaching positions have been decreased, but are not completely eliminated in the public education system (Tyack & Hansot, 1992; Kelsey, 2007).

Definition of Generations.

Currently, there are four distinct generations working together. The four groups are: Traditionalist (1900-1945), Baby Boomers (Vietnam Generation and the Me Generation) (1946-1964), Generation Xer's (1965-1980), and Millennials (1981 -1999) (Lancaster & Stillman, 2002; Howe & Strauss, 2000). The largest generation is the Baby Boomers. This group is approximately 80 million people and they are generally defined as the Vietnam Generation (early Baby Boomers) and the Me generation (late Baby Boomers) (Marston, 2006). Moreover, this group is focused on individuality, being a workaholic, competitive, and optimistic. Baby Boomers believe they have education and idealism to change things in the United States of America. In addition, they focus on avenues to pursue so they can advance and change the current management style. Work ethic is measured in hours and not in productivity. Moreover, teamwork is critical to success; however, competitiveness within the group is prevalent (Lancaster & Stillman, 2002).

The Generation Xer's is a much smaller group of approximately 46 million people, but this group is extremely influential in society. One may describe individuals in this group as skeptical, reluctant, slacker, lethargic, sarcastic and unmotivated. This particular group does not associate themselves with any heroes and they are extremely suspicious of the Baby Boomers values. It is important to note that the Generation Xer's was identified as the *latch key* kids and had to learn to fend for themselves because their parents were busy working (Lancaster & Stillman, 2002; Marston, 2006).

The Millennials are comprised of approximately 76 million people. This generational group is still in the process of showing itself to the world and what they will do in the work place (Lancaster & Stillman, 2002; Marston, 2006). Millennials insist on having open, constant communication and positive feedback from their employers. In addition, they seek mentorship so they can reach their goals in the work force.

Purpose

The purpose of this phenomenological study was to discover the perception and barriers of four female agriculture educators across generations in the non-traditional field of teaching agriculture education. Participants were asked the open-ended question, "What have been your personal and professional experiences in teaching agricultural education?"

Methods and Procedures

A constructivist tries to understand the world in which we live (Gubba & Lincoln, 2005). The ontology of a constructivist is that multiple realities are constructed and are based in local and specific co-constructed realities. Constructivists believe there can be no objectivity and absolute realities cannot be known. The epistemology is a relationship between the knower and known. The researcher and subject co-construct understanding of the worldview and that view can be transactional (Bettis and Gregson, 2005).

The methodology of a constructivist is often naturalistic or phenomenological qualitative methods, which can be hermeneutical and dialectical. Denzin and Lincoln (2005) defined hermeneutics as "… an approach to the analysis of text that stresses how prior understandings and prejudices shape the interpretive process" (p.27). Oxford American Dictionary (1982) defines dialectical as "investigation of truths in philosophy etc. by systematic reasoning" (p. 237). Bettis and Gregson (2005) stated that constructivists use an inductive nature of qualitative inquiry and seek theories that arise from the data and help explain how humans conceptualize the world in which they live.

The research tradition and methodology utilized in this study was phenomenology. Creswell (1998) described phenomenology as a study of the "lived experience for several individuals about a concept or the phenomenon" (p. 51). Phenomenology is about exploring others experiences to make meaning of their experiences. The researcher tries to capture the *essence* of the experience in her writing so others can also experience or have an understanding of that experience. The researcher has to have a broad perspective of the worldview and suspend her own preconception of experiences. In addition, the researcher has to analyze how individuals in the study experience the phenomenon and then write about what was experienced.

There were four participants in this study: early Baby Boomer (Vietnam Generation), late Baby Boomer (Me Generation), Generation Xer, and Millennial. Taylor, the early Baby Boomer, grew up on a working ranch and loved all aspects of agriculture. Taylor made the decision to take agriculture classes in high school; however, she was not allowed to take vocational agriculture classes. Taylor went on to college, graduated with a Bachelor of Science in Animal Science and continued on to advance degrees in agriculture education.

Karen, the late Baby Boomer, never considered taking agriculture classes in high school. The classes were taught at her high school, but she chose not to take agriculture classes. When it came time to enter college Karen decided on pre-veterinarian medicine with a minor in animal science. She worked in a veterinarian clinic and did some field experiences with local veterinarians. She came to the conclusion that veterinary medicine was not for her. Karen remained in the College of Agriculture, but thought she would like to teach high school biology. Karen did her student teaching in agriculture education and enjoyed the experience. She graduated with a Bachelor of Science in Agriculture and Extension Education and continued on to advance degree in education. Karen taught high school agriculture for 16 years and currently serves as Career and Technical Education Director.

Roxanne, the Generation Xer, grew up on a small family farm in a rural area. Roxanne graduated from college with a Bachelor of Science in Animal Science with a double minor in biology and general education. She became certified to teach biology and agriculture education. Roxanne continued her education and obtained an advance degree in education. She taught high school agriculture for several years and is currently in administration.

Paige the Millennial, participated in agricultural education classes in high school. Paige graduated with a Bachelor's Degree in Agriculture and Extension Education. She began her teaching career after graduation and taught for two and one-half years. She is currently working in another field of agriculture.

The method of gathering data from the participants was through interviews. Open-ended questions were utilized and the responses were tape recorded. Follow up questions to the interview came from personal contact, phone interviews or through e-mail depending on the location of the participant. Follow up questions were asked after the interviews and were transcribed within one week of the interview. Member checks were accomplished by mailing participants a copy of the interview with a member check sheet. The participants had the opportunity to make corrections and verify the interview.

The coding for the interviews: each participant had a pseudonym and each line transcribed and page was numbered. The coding would then be used to identify key quotes by the participant. An example of the coding: K=1-14, the letter stands for the participant, first number represents the page, and the third number represents the quote. Key themes were brought forth by the researcher and the participants and researcher co-constructed the meaning of their experiences through feedback.

Validity and reliability in qualitative research can be met through six strategies (Merriam, 1998). *Triangulation* is achieved through using multiple methods to confirm themes or findings.

Another researcher trained in qualitative methods reevaluated the findings and confirming themes found in the research. The participants did *member checks* through out the research process. A transcript of the interview and a rough draft of themes and findings were sent to each member and asked if the findings are plausible. *Peer examination* and *feedback* were accomplished by having the participants read draft copies of the findings and to make corrections or additions to the findings. *Collaborative research* was achieved through the conceptualizing the study with other teacher educators. *Researcher's biases* were established at the out set of the study; however, those biases can never fully be removed.

Results and Findings

In this study, four female agriculture teachers across generations were asked the open-ended question, "What are your experiences in teaching agriculture education in a predominately male field? The four emerging themes: qualifications to teach agriculture education, challenges in teaching agriculture education, stress in teaching agriculture education, and stereotyping of agricultural education teachers, were revealed.

Qualifications

All four participants revealed they had to prove they were qualified to teach agriculture education during their teaching careers. Therefore, the major theme to emerge was participants proving they are worthy to teach agricultural education.

Proving women are qualified. The participants felt they had to prove their ability to teach agriculture to students, other teachers, administration, parents and community. Responses ranged from the Vietnam Generation (T=4-124) "…when you are one of the only women in a field teaching, you spend so much time trying to prove yourself you don't think a lot about things like diversity, equity, or even gender discrimination." The Me Generation individual stated, (K=5-73) "…he (Career and Technical Education Director) didn't think I was qualified for that job … there are male and female students that just down right tell you. Their parents will tell you. They refuse female authority and like I said, it's not just males." The Generation Xer explained (R=4-75) "…I had a difficult time getting a job," and the Millennial added, (P=14-309) "…you have to prove to them (students) that you know about agriculture…" All four participants frequently responded by saying they had to prove themselves to different groups of people.

Taylor indicated that she had to prove that she could teach agriculture education in high school and at the college level. Taylor realized when pursuing an agriculture teaching position (T=2-61) "…reality hit again and I realized there were very few jobs available for women in any field of agriculture in 1974." [While] Karen believed she had to prove herself through the quality of her agriculture program and if students were active in the FFA and the community was aware of the program's success, then it was considered a credible program.

Roxanne indicated that she had to prove herself and gain respect at the same time. She commented, (R=11-241) "…you can earn respect within your school…you can earn respect from your vocational director, principal… if you want to earn the respect of your fellow teachers and prove you can teach agriculture education, that comes from competition."

Paige believed she had to prove herself to students so they would respect her. She responded by saying, (P=14-313) "…the upper classmen, they wanted to see how far they could push me…see what they can get away with."

The process employed to accomplish proving themselves was working long hours, teaching science and pursuing a career in agriculture education. Taylor qualified this by adding, (T=7-209) "Early on in my career…a friend told me that as a woman I would need to be everywhere (work, competitions, and meetings) earlier than anyone else, do everything better…Sadly, I believed that for years…first to arrive, the last to leave…" Others responded by saying (K=26-396) "You will have to work your tail off" to (R=11-245) "…an indication of work and that's an indication of putting in your time… that's an indication of equal."

Karen and Roxanne acknowledged how difficult it was to attain their first agriculture teaching position. Roxanne shared her story about of not being hired because she was a young, unmarried female. Both participants had supervisors tell them (K=5-70) "…that I did not belong in that job…because I was a female." However, Paige did not have difficulty in obtaining her first teaching position in agriculture, but her frustration came from her co-worker. (P=2-40) "I was being told what to do a lot. I don't know if that was because I was young or I was female but that was hard."

Challenges

All four participants had different challenges to overcome than a non-traditional teacher. Three prevailing sub-themes emerged: proving women can perform agriculture education duties, sexism, and resentment from students and community.

Proving women can perform agriculture education duties. Two of the participants revealed they had low number of students in their program; and they had to increase agriculture education enrollment to continue teaching the subject. Taylor explained she was (T=2-78) "…offered a part-time position at the local community college…had a total of six students in the agriculture program. Six years later…one hundred twenty (students) and still only one teacher." Roxanne realized her co-worker was going to retire and they had forty-two students in their agriculture program. She knew they would keep him with a low number, but not her. She explained, (R=6-133) "I was not going to be able to stay in a program and keep a job with forty-two kids. I went on a big recruitment drive." Roxanne was successful in her recruitment drive and her enrollment increased.

Other challenges participants faced were teaching students who were only a few years younger. Karen told of her experience, (K=4-49) "I was the first female agriculture teacher the school had ever had… students were three years younger than I was…it was difficult." Karen also shared she did not have a lot of experience in FFA, (K=20-293) "I worked harder…I knew nothing and I've not had those experiences. I just (pause) I just had to work that much harder." Roxanne also stated, (R=12-265) "For some people it was a little bit threatening…I felt I had something to prove."

For Paige, it was challenging to be in the classroom, but more challenging to work with an older co-worker. She explained, (P=2-34) "…teaching with him as my co-worker (pause) felt like sometimes he was more my boss." She found it to be very difficult in this situation, (P=4-73) "It's hard, as a young teacher talking to someone that's been teaching for a long time and being told "no" I couldn't do things." Other challenges were the administrator's perceptions of what she could teach or not teach. (P=7-151) "…the male teacher teaches shop, power machinery…they never ask me to do it because they think I can't." However, participants expressed they had to prove themselves to their male co-workers. In fact, their co-workers were willing to help them learn to teach agriculture by spending extra time with the new teachers and showing them how to do things.

Sexism. Each encountered some form of sexism from the community, students, and colleagues. Some forms of sexism from the community were perceived conceptions of what is appropriate or not appropriate behavior for a female agriculture teacher to display. Roxanne commented on a field trip to a hog farm to castrate pigs. The field trip was cancelled when the farmer realized it was a female agriculture teacher who would be bringing agriculture students. Roxanne called to reschedule the trip and spoke with the hog farmer's wife. (R=25-652) "My husband didn't realize that you were a woman and he does not think that it is appropriate for you to be out here with boys doing that."

Taylor realized there were few jobs available to women in agriculture in the early seventies. (T=2-63) "I spent my first few years of marriage…working at random jobs in agriculture – usually as a technician" explained Taylor. She realized there was gender discrimination in agriculture education by a comment a school board member made. He said, (T=6-186) "Taylor, you are doing a great job! However, I feel you should know that I voted not to re-new your contract. I just don't believe mothers should work outside the home."

Karen, Roxanne, and Paige experienced some form of sexism from students. For example, students asked them out on a date or made sexual comments. Paige acknowledged (P=13-298) "I've had kids say things which have offended me…you gotta have that line…you're the teacher." For example, Karen revealed statements made to her by students, (K=4-66) "Oh, ag teachers didn't look like this, you know, when I was in school." The sexual comments did not only come from students but from colleagues. For example, Roxanne shared her poignant story of how a colleague she respected and admired made a sexual overture to her. (R=12-267) "I was so shocked…hurt…I was insulted." Karen sums up her story of the statements made to her, (K=11-207) "I had teachers that made remarks and I see that same thing happening to young female teachers now…looking back twenty years ago and that same thing was going on with me and I hated it."

Resentment from students. Three of the participants had students resent them for various reasons. Karen felt resentment at two different schools where she worked. Both incidents involved a teacher retiring and students were devastated the male teacher left. Karen revealed in one program a student was so resentful of her being there and not his former male agriculture teacher, the student put a quote in the school yearbook, (K=10-181) "…'I would have the good sense to move on, or do something better in her teaching career.' You know that really hurt…just so resentful…had to spend their senior year with me."

Paige experienced resentment from students by creating tension between the two agriculture teachers and this caused a great deal of conflict. Paige commented students did not view a female as an appropriate agriculture teacher and consistently challenged her authority by causing conflict with her co-worker.

Stress

All four participants indicated teaching agriculture was a high stress job. Two sub-themes were revealed and were interlinked together. Those themes are balancing family and work and the high burnout/low return rate of female agriculture teachers.

Balancing family and work. Participants revealed several stories and incidents of how balancing work and family together was difficult. Three of the participants explained how having children changed the dynamics of balancing work and family. All participants agreed the job was demanding and required a good relationship with their husbands.

Three of the participants have had children and they never took much time off from their jobs. Taylor went back to work when her first child was eighteen months old. Karen and Roxanne claimed they never took any extra time off when their children were babies. Taylor reflected, (T=2-82) "I had a growing family and my job did not seem conducive to a healthy family life…. I was averaging seventy-five days a year on the road. I put my family through hell. Don't get me wrong, there were good times."

Karen and Roxanne found the agriculture community to be very open about bringing children to different FFA functions. Both told how their children grew up around FFA students/competitions and because of that, their children have had many good experiences. Taylor, on the other hand, did not take her children with her. She commented on how she missed several activities her sons' were in. Taylor's job was so time consuming one of her son's looked at her and said, (T=3-99) "Come back to see us sometime. It was like I was a traveling salesman or something." All three female agriculture teachers agreed that spending the amount of time on their job may not have been worth it to their family.

Besides trying to balance work and family life, participants realized their jobs were demanding and become more demanding if you so desire. Karen described her experience as, (K=21-304) "You get sucked into a big black hole if you're not very, very careful….it can be very, very overwhelming." Roxanne concurred by saying, (R=17-376) "I designed my life around my job… that was the focus from the beginning…once I made the comment that being an ag teacher, it's like riding a tiger…you can't get off because it'll bite you." For Paige, her first year teaching was overwhelming. She discovered, (P=9-189) "…never enough time in the day to get everything done."

High burnout / low return rate. The participants acknowledged the retention rate of female agriculture teachers is low. They perceived the reasons to be because of the amount of paper work, commitment to CDE's, and the classroom preparations. Karen also theorized why females do not return, (K=21-316) "…it gets most difficult for them (females teaching), probably during the transition of starting a family….they look pretty weary when their draggin' in strollers…that's when it gets really hard…I think that's the maker or breaker point for a lot of females. You're torn at that time."

Coinciding with the low retention rate is high burnout amongst the agriculture teaching profession. In discussion, participants revealed there is a level of expectation from the students, community and the administration. In addition, there is extreme pressure to maintain a high level of standard in the FFA and academically. Roxanne's explanation is, (R=17-380) "It has to do with expectations of others and people around you. I have often believed that is why there is a high burnout rate among agriculture teachers…you can make it as big of a monster as you want to make it." Whether the factors that contribute to stress are real or perceived, they have impacted participants and their families.

Stereotyping of Agriculture Education Teachers

All four women revealed they had people stereotyping them as an agriculture education teacher and questioned their credentials. Comments were made from others about their appearance and ability to teach agriculture education because they were female.

Breaking the stereotyping of an agriculture teacher. As the four women's stories unfolded, each experience was different. Some people told the women they did not represent what an agriculture teacher should look like. Taylor's first encounter was in high school. She was not allowed to take vocational agriculture classes and was directed to take the more traditional female classes such as home economics and business or typing classes. Taylor recalled what it was like to teach agriculture education in the 1980's, (T=7-199) "…it was like being a pioneer to another planet where no one spoke your language." She also realized there were no other women to look to as a role model. Hence, Taylor became a role model for future female agriculture education teachers.

Karen and Roxanne recalled instances where they were at formal agriculture education functions and it would be announced, (K=12-227) "Would all the agriculture teachers and their wives please stand up." Both claimed it took several years for that particular announcement to change. Participants also noted people in the community and in the agriculture education field assumed they were someone's wife.

Karen described her first encounter of stereotyping, (K=5-70) "…a male in a supervisory position told me I did not belong in that job because I was a female." In addition, Roxanne recalled two incidents of stereotyping at the beginning of her teaching career. She went to a male agriculture teacher for help and his response was, (R=10-222) "Young lady, your biggest problem is you are a girl in a boy's club." However, when Roxanne sees him now, he claims agriculture education is turning into a sorority (more females are teaching agriculture education).

Karen, Roxanne, and Paige proclaimed administrators assumed they would have discipline problems due to their gender. Roxanne explained, (R=10-211) "…they (administrators) were anticipating that I would have discipline problems because I was a female." These women felt they were under a microscope and the administration, other teachers, and the communities were looking for them to make mistakes or fail at being an agriculture teacher. Taylor added, (T=6-168) "In the single teacher program, all success and failure falls on the shoulders of the teacher. You are responsible for getting and keeping the ball rolling…there is little room for error."

Roxanne sums up her experience with stereotyping this way, (R=16-344) "…to keep from being stereotyped as the emotional one or somebody having female issues, I worked hard at my job."

Conclusions

Although participants were from different generations, there doesn't appear to be differences on the types of challenges faced. Each revealed having to prove themselves capable of teaching agriculture education to different groups of people such as other teachers, students, administrators, and the community. Such things as the need to work hard, community establishment, and teaching *male* classes are a few areas where the women in this study felt they needed to prove themselves. However, participants believed they had made a difference in agriculture education and noticed an increase in female enrollment. In addition, these women believed they were a positive role model for all their students, female or male. Therefore, it can be concluded that women from different generations in this study did not differ in their teaching challenges.

The challenges revealed in this study were proving women can teach agriculture education, dealing with sexism within the teaching system and community, and challenges students present. Within proving women can teach agriculture education, the participants had the challenge of increasing enrollment to retain their career. They knew the school system would keep the older male agriculture teacher with low numbers, but not them. Other challenges were being the first female teacher in the school system and having to over come many of the perceived barriers of what is appropriate and not appropriate for a female agriculture teacher.

Based on the women's stories, sexism had been experienced throughout their careers. Each encountered sexism from the community, students and colleagues. Community members made comments to the women about their gender and appearance. In addition, students asked the teachers out on dates and would make inappropriate comments. Furthermore, participants revealed teaching agriculture education was a demanding and time consuming job. Creating and keeping a quality agriculture/FFA program demanded the teacher to be committed to the job and students. Each female recalled how difficult it was to balance a family life and how overwhelming teaching agriculture education was. However, they all agreed having a supportive partner was extremely important in maintaining a balance of family life and career. Overall, participants realized their jobs were time consuming and demanding on many levels.

Because teaching agriculture education is demanding, there appears to be a high level of burnout/low retention rate of female teachers (Croom, 2003). Again, across the four generations it was revealed the amount of paper work, commitment to CDE's, and the classroom preparations all contributed to why teachers did not return to teaching agriculture education. Furthermore, the four women felt there is a level of expectation from the administration, students, and community and the teacher must maintain a high level of standards academically and in the FFA to meet those expectations. Whether the factors that contribute to stress are real or perceived, they have impacted the participants and their families.

The four women disclosed that they have been exposed to some form of stereotyping. The stereotyping ranged from females should not be employed in agricultural education, the pre-conceived appearance of an agriculture teacher, and discipline in the classroom would be more pronounced for female teachers; many people assumed the female agriculture teacher taught *farming* classes or made the comment, “Where is your agriculture teacher?” when the teacher was standing there.

Implications/Recommendations

Understanding challenges women face in the field of agricultural education is crucial to assisting with the development of females in the profession. If we don’t hear their voices, then we (as a profession) can’t retain female teachers nor can we assist in the making the experience better. As seen in the findings, females from different generations are experiencing some of the same issues. By acknowledging these issues, educational professionals can provide assistance to women in the field. In addition, other females in the professional can utilize the data to better understand barriers or issues one may face when entering the profession. Whatever the situation, understanding different individual perspectives can only make an organization stronger and develop better professionals: male or female.

Based on the results of this study, recommendations of helping females overcome real or perceived barriers in agriculture education is needed. One recommendation is to implement a mentoring system for all new teachers. From this study none of the participants had a formal mentoring program. The Vietnam Generation participant was a pioneer in agriculture education and received help through other male agriculture teachers. It is apparent that female agriculture teachers need a formal mentoring system to help them overcome the many challenges and barriers they face in teaching agriculture education.

For female agriculture teachers to overcome sexist and biased behavior in the public school system, they will need training. Kelsey (2006) concurred many women are faced with sexist and biased situations in the school system. In this study of four women across the generations, they identified sexist and biased behavior on many levels. It is recommended the university teacher preparation programs implement a program designed to make pre-service teachers aware of sexist and biased behavior and in-service training for new teachers, current teachers, and administrators. In addition, a course on gender challenges in the classroom needs to be taught at the university level.

In a time where three generations are working together, it is imperative that they are capable of working together in harmony. It has been documented by Lancaster and Stillman (2002) and Marston (2006) that the work place is changing with different ethics, style, and expectations in the work force. As educators, we need to change the work atmosphere and break down the real and perceived barriers in order to retain female agriculture teachers.

Questions for Further Study

Further study is needed to determine if the perceived and real barriers across the four generations are prevalent in a larger group of female agriculture teachers. Researchers should examine the effects of the following issues in teaching agriculture education and how it affects the retaining of teachers:

- What are the challenges of males teaching agriculture education?
- What methods should be employed for new teachers to become aware of the demands of teaching agriculture education?

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Keepers, Stayers, Leavers, and Lovers: Are there Teacher Efficacy and Job Satisfaction Differences between Novice and Experienced Teachers?

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The teacher shortage in the United States is a continuous problem for the American education system. Maintaining a high level of job satisfaction of teachers is an important goal for administrators, superintendents, and school systems. Employees who are more satisfied are generally more productive and committed to the profession. Beliefs in competence can play a major role in job satisfaction. The purpose of the study was to determine if novice teachers (teachers with less than five years teaching experience) thought different about their level of teacher efficacy and job satisfaction than teachers with five or more years teaching experience (experienced teachers). Survey research methods were utilized to collect data. A random sample of agricultural educators in the United States was sent a questionnaire which included items regarding perceptions of teacher efficacy and job satisfaction. Overall, agricultural educators possessed a high level of teacher efficacy and were satisfied with their jobs. For the most part, there was no difference between novice teachers and experienced teachers on teacher efficacy and job satisfaction factors. There were however, significant differences between two job satisfaction factors which may have an impact on novice teacher retention. Studies on teacher retention should continue to be a priority in agricultural education in order to keep highly qualified teachers in the classroom.

Introduction/Theoretical Framework

The teacher shortage in the United States is a continuous problem for the American education system. It appears, and has long been reported, that the shortage is due to the high number of teachers retiring, coupled with the demand for more teachers from the increasing number of school age children (Ingersoll, 2004). The teacher shortage, however, is much more than a supply and demand problem. Ingersoll (2004) suggested that the shortage of teachers is due to attrition—the number of teachers who leave one teaching job for another or leave the teaching profession to pursue other activities. What are other reasons for teachers leaving the profession? Is it possible that whenever a teacher leaves the profession a level of job dissatisfaction is implied?

Nieto (2003) determined that teachers entered the field to make a difference in the lives of students and the next generation. Teachers stay in the teaching profession for reasons that have more to do with psychological and emotional feelings than with physical conditions. Urban teachers stay in conditions where they are frustrated with bureaucracy and self doubt of their own ability. The urban teachers stay because they believe in and respect their students (Nieto, 2003). This is similar to the findings of Farkas, Johnson, and Foleno (2000) who conducted a study looking at the psychological and family related factors that had a relationship with peoples' decision to enter teaching. They reported teachers felt it was essential that a job involve work that one loves. Of those surveyed, 96% said that their current teaching job involved work they loved. Eighty-one percent also stated that it was “absolutely essential that a job allow time for family as well as contribute to society” (Farkas, Johnson, and Foleno, 2000, p. 10).

Today’s teacher is expected to be paid well for their job performance. Teachers feel the work is extremely important and want opportunities for advancement as well as variety in their teaching jobs. Teachers today also feel that it is extremely important to collaborate with peers and to have an administration and community which is supportive (Neito, 2003). Of the teachers who remain in teaching, the perception is that of all the possible options, teaching still remains the most attractive possibility (Guarino, Santibanez, & Daley, 2006).

Research has shown that attrition is higher for novice teachers with less than five years experience. Retention is also higher for more experienced teachers until those individuals reach retirement age (Guarino, Santibanez, & Daley, 2006). A study of Texas teachers in 1993-1996 found teachers who left the Texas public schools were either very young or in their first two years of teaching (Hanushek, Kain, and Rivkin, 2004). Ingersoll & Smith (2003) utilized the data of over 6,000 teachers in the Schools and Staffing Survey to determine “that after just five years, between 40 and 50 percent of all beginning teachers have left the profession” (p. 31).

Maintaining a high level of job satisfaction among teachers is an important goal for administrators, superintendents, and school systems. Employees who are more satisfied are generally more productive and committed to the profession. The cost of hiring, training, and development of new teachers and staff members into an existing school culture increases when the process has to be repeated on a regular basis because of teacher attrition (Hoy & Miskel, 2008). The cost can be decreased when teachers are retained.

Job Satisfaction

Job satisfaction refers to the “extent to which a person can meet individual personal and professional needs as an employee” (Gorton, 1982, p. 1904). Many theories have played an influential role in the research of job satisfaction. Maslow’s hierarchy of needs (Maslow, 1954) is a theory that many administrators use to motivate teachers and increase satisfaction. The psychological needs of Maslow’s theory include a feeling of belonging to a group as well as being respected by the group which increases self esteem (Woolfolk, 2004).

Another theory guiding job satisfaction is the Herzberg motivator-hygiene theory (Herzberg, 1966). This theory states motivator factors contribute to job satisfaction while hygiene factors contribute to job dissatisfaction. The motivator factors lead to satisfaction because they satisfy the psychological needs of the employee including self-actualization (Hoy & Miskel, 2008). At the same time, but working independently of job satisfaction, is dissatisfaction. The hygiene factors tend to produce dissatisfaction such as negative attitudes and loss of production.

Research in job satisfaction has focused mainly on teacher effectiveness as being a large predictor of job satisfaction and retention (Berns, 1990; Bruening & Hoover, 1991; Grady & Burnett, 1985). Previous studies have looked to determine the extent to which teachers are satisfied with their jobs (Beavers, Jewell, & Malpiedi, 1987; Bennett, Iverson, Rohs, Langone, &

Edwards, 2002; Cano & Miller, 1992; Flowers & Pepple, 1988; Grady & Burnett, 1985; Newcomb, Betts, & Cano, 1987; Walker, Garton, & Kitchel, 2004). Walker, Garton, & Kitchel (2004) looked specifically at the change in job satisfaction level of beginning teachers over a five year period and determined that teachers, both those who left the profession and those who stayed, were generally satisfied with their first year of teaching. Berns (1990) examined the relationship between job satisfaction and retention in regard to professional dispositions. Cano and Miller (1992) studied the relationship between gender and job satisfaction. Cano and Miller also posited it is not merely enough to know what level of job satisfaction that teachers hold but more research needs to be done looking at individual factors of job satisfaction. Castillo, Conklin, and Cano (1999) studied the factors of achievement, advancement, recognition, responsibility, and the work itself, as well as, interpersonal relations, policy and administration, salary, supervision, and working conditions.

Berns (1990) identified factors of job satisfaction among vocational educators in Northwest Ohio. Berns' study included 38 job satisfaction indicators divided into eight different constructs including teacher assignments, attributes of the job and school, students, teaching, teaching as a profession, competence, career, being appreciated, and administration. Berns determined the teachers, for the most part, were satisfied with their jobs, but certain aspects of the job were less satisfying than others. The factors that were less satisfying included conditions related to teaching as a profession and school administration.

Bennett et al. (2002) used the constructs from the Berns (1990) instrument to determine the level of job satisfaction among agricultural educators in the state of Georgia and the percentage of teachers who were at risk of leaving the teaching profession. It was concluded Georgia teachers were satisfied with their jobs as well, but the factors resulting in less satisfaction included salary, appropriate students placed in their classes and the status of teaching within society.

Teacher Efficacy

Beliefs are important when considering motivation and goal setting. Beliefs in competence can play a major role in job satisfaction. Teachers who believe in their ability to positively affect students are generally more satisfied with their job. According to Hoy and Miskel (2008), teacher efficacy is a sound predictor of job satisfaction.

Bandura developed the theory of self-efficacy out of his social cognitive theory. Self-efficacy is defined by Bandura (1997) as the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). Self-efficacy is more easily defined as the feeling that someone has about her/his competence on a certain task or area; self-efficacy is a motivating factor. The motivation and actions are based on what people believe they are capable of accomplishing instead of what they are capable of accomplishing in reality. If a person has a high sense of self-efficacy, this will lead to more effort and persistence when faced with undesirable consequences. On the other hand, those with a low sense of self efficacy are more apt to give up easily or avoid a difficult task altogether (Woolfolk, 2004). Based upon social cognitive theory, self-efficacy can be the largest motivating factor in a person's success.

When self-efficacy is studied in the context of teaching, it is referred to as the teacher's sense of efficacy, and is the belief that teacher's capabilities can determine the outcomes of student engagement and learning among even the most difficult or unmotivated students. This belief can directly affect the behaviors of the teacher in the classroom when related to decision making, goal setting, evaluation, developing of new ideas for teaching, and persistence when facing setbacks. Three factors for determining a teacher's sense of efficacy include instructional strategies, classroom management, and student engagement (Tschannen-Moran & Woolfolk Hoy, 2001). Self-efficacy can reasonably be applied to the teaching profession and more specifically, to agricultural education to determine if teachers who have a high sense of self-efficacy are more satisfied with their jobs.

Teacher efficacy in agricultural education was studied to determine the self-efficacy of student teachers (Edgar, Roberts, & Murphy, 2007; Harlin, Roberts, Briers, Mowen, & Edgars, 2007; Knobloch, 2006; Roberts, Harlin & Ricketts, 2006; Wolf, Birkenholz, & Foster, 2007). Knobloch and Whittington (2003) found teachers with lower efficacy have less of a career commitment to teaching. Rocca and Washburn (2006) studied teachers' efficacy in relation to alternative methods of certification. Rocca and Washburn determined no difference between traditional and alternative certified teachers in the perception of their ability to teach. Duncan and Ricketts (2008) researched overall self-efficacy as opposed to teacher efficacy when comparing traditional and alternative methods of certification. Duncan and Ricketts found traditionally certified teachers have a higher level of self-efficacy than those who are alternatively certified.

While job satisfaction and teacher efficacy have been studied among secondary agricultural educators independently, the review of literature did not yield an examination of the two constructs together. Moreover, a current study is warranted to determine the relationship teacher efficacy has with job satisfaction among secondary agricultural educators in the United States and the number of years in the profession. Furthermore, the researchers sought to determine the difference of teacher efficacy and job satisfaction between novice and experienced teachers.

Purpose/Objectives

The purpose of the study was to determine if novice teachers (teachers with less than five years teaching experience) thought different about their level of teacher efficacy and job satisfaction than teachers with five or more years teaching experience (experienced teachers).

Specifically, the following research questions guided the study:

1. Is there a difference in the level of teacher efficacy between novice teachers and experienced teachers?

2. Is there a difference in the level of job satisfaction between novice teachers and experienced teachers?

Methods/Procedures

The population for the study was comprised of secondary agricultural educators who were members of the National Association of Agricultural Educators (NAAE) as of October 2008, and included 5290 secondary agricultural educators. A random sample of individuals was drawn from the population. The random sample consisted of 361 individuals based on an alpha level of .05. To draw the random sample from the population, individual names were sorted alphabetically by last name in ascending order and assigned a sequential identifier that began with number one. A table of random numbers was constructed using the website www.randomizer.org. Individual cases were randomly selected for the sample based on the numbers from the table that corresponded to the assigned identifiers.

Two pre-existing instruments were utilized to create the questionnaire. The instrument used by Berns (1990) to determine the level of job satisfaction among vocational education teachers and modified by Bennett et al. (2002) was used to determine the level of job satisfaction among secondary agricultural educators. Bennett et al. (2002) established content validity through a panel of experts. Additionally, instrument reliability was established and a Cronbach's alpha of .95 was calculated (Bennett et al., 2002). The instrument consisted of 44 job satisfaction items that used a 5-point Likert type scale with responses including 1-strongly disagree, 2-disagree, 3-undecided/no opinion, 4-agree, and 5-strongly agree. The 44 job satisfaction items were organized into nine constructs: their (teachers') assignments, attributes of the job and school, students, teaching, teaching as a profession, their own (teachers') competence and effectiveness, their own (teachers') careers, being appreciated, and school administration.

The 24 item Teachers' Sense of Efficacy Scale, long form, (Tschannen-Moran & Woolfolk Hoy, 2001) was utilized to collect data on secondary agricultural educators' sense of teacher efficacy in terms of the factors instructional strategies, classroom management, and student engagement. The instrument, a summated rating scale, asked respondents to indicate their level of agreement to the response "How much can you do?" for each of the 24 items related to teachers' beliefs about their abilities. Responses included nine possible choices which ranged from 1-nothing to 9-a great deal. Tscahnnen-Moran & Woolfolk Hoy (2001) reported Cronbach's alpha coefficients of .86 for the instructional strategies factor, .86 for the classroom management factor, .81 for the student engagement factor, and a coefficient of .90 for the overall instrument to establish instrument reliability.

In addition to data collected on job satisfaction and teacher efficacy, the instrument included five demographic questions that asked respondents to report age, gender, number of years in their current position, total years teaching agriculture, and total years teaching (all academic subjects).

Institutional Review Board approval was granted for this study. Data were collected in two waves following Dillman's (2000) recommendations for mail surveys. A total of 178 individuals returned instruments, resulting in a response rate of 49%. The researchers controlled for non-response error by comparing early to late respondents (Miller & Smith, 1983) on the demographic characteristics age, number of years in the current position, total years teaching agriculture, and total years teaching as well as each of the construct scores for job satisfaction and teacher efficacy; no significant differences were found between the two groups. Early respondents were defined by the researchers as individuals who responded to the first wave (n = 135) and late respondents as the individuals who responded to the second wave (n = 43). Since no significant differences were found between the groups, the data were collapsed to a single set.

Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 17.0. Based on the Ingersoll & Smith (2003) teacher retention study, participants with less than five years experience were named novice teachers, while participants with five or more years were classified as experienced teachers. There were 26 valid cases in the novice teachers group and 122 valid cases in the experienced teachers group. Independent samples t-tests were used at an alpha level of .05, set a priori, to determine if the groups were different on the teacher efficacy factors as well as the job satisfaction factors. Since the groups were not equal in terms of number of cases, Levene's Test for Equality of Variances was used to meet the equal variances assumption for performing a t-test for independent groups. According to Levene's Test, the variances of the two groups were not statistically different, therefore equal variances were assumed when interpreting the output for the independent samples t-tests.

Results/Findings

The first objective sought to determine differences between novice and experienced teachers on the teacher efficacy factors. Mean scores on the three teacher efficacy factors are reported in Table 1.

Table 1

Teacher Efficacy Scores of Agricultural Educators

	Novice teachers		Experienced teachers	
Teacher efficacy factor	$\bar{X}$	*SD*	$\bar{X}$	*SD*
Classroom management	7.0	1.1	7.2	1.0
Instructional strategies	6.9	0.9	7.2	0.9
Student engagement	6.4	1.0	6.4	0.9

Note. Scale: Response to "How much can you do?" 1-nothing, 3-very little, 5-some influence, 7-quite a bit, 9-a great deal.

A descriptive analysis of the results showed that experienced teachers reported higher scores on the classroom management and instructional strategies factors. Novice teachers and experienced teachers scores were virtually the same for the student engagement factor. When subjected to an independent samples t-test at the .05 level of significance, there were no significant differences between novice teachers and experienced teachers on the three teacher efficacy factors.

In terms of the second objective, related to differences between novice teachers and experienced teachers on the job satisfaction factors, the mean scores on each job satisfaction factor are reported in Table 2.

Table 2

Job Satisfaction Scores of Agricultural Educators

	Novice teachers		Experienced teachers	
Job satisfaction factor	$\bar{X}$	*SD*	$\bar{X}$	*SD*
Administration	3.8	.8	3.7	.8
Attributes of the job and school	3.7	.6	3.7	.7
Being appreciated	3.5	.8	3.8	.7
Career	3.5	.9	3.5	.9
Competence	3.9	.7	4.3	.5
Students	3.4	.8	3.7	.6
Teacher assignments	3.9	.7	4.0	.7
Teaching	3.8	.6	4.0	.6
Teaching as a profession	3.2	.8	3.2	.7

Note. Scale: 1-strongly disagree, 2-disagree, 3-undecided/no opinion, 4-agree, 5-strongly agree.

A descriptive analysis of mean scores revealed that novice teachers reported lower scores on the being appreciated, competence, students, teacher assignments, and teaching job satisfaction factors. Novice teachers and experienced teachers reported nearly equal scores on the attributes of the job and school, career, and teaching as a profession factors. At the .05 level of significance, experienced teachers reported higher scores on the being appreciated and competence factors.

Conclusions/Recommendations/Implications

Based on the random sample of agricultural educators in the study, the researchers concluded that among secondary agricultural educators in the United States, there were no significant differences in the level of teacher efficacy between novice teachers and experienced teachers. Seven of the nine job satisfaction factors yielded similar results, where there were no significant differences in job satisfaction scores between novice and experienced teachers. There were, however significant differences between novice teachers and experienced teachers in the being appreciated and competence factors, where experienced teachers reported higher scores on those two factors related to job satisfaction.

While the researchers anticipated statistical differences between novice teachers and experienced teachers on teacher efficacy and job satisfaction scores, the data analysis revealed few differences. In the quest to find further reasoning behind the teacher retention problem among agricultural educators in the United States, only two factors emerged that may explain why teachers leave the profession within the first five years: novice teachers' level of satisfaction with being appreciated and satisfaction with their level of competence.

The items that constituted the being appreciated factor related to teachers' level of satisfaction with appreciation from parents and colleagues. Novice teachers in the study were significantly less satisfied than their experienced counterparts in matters related to appreciation. Related to the competence factor, novice teachers were significantly less satisfied with their level of competence than experienced teachers. Items related to the competence factor included feeling competent in their teaching position, effective with students, and adequately prepared to teach in the program. What can teacher educators do to increase novice teachers level of satisfaction with matters related to their perception of appreciation and competence? Does it make sense that novice teachers will feel less appreciated or less competent than experienced teachers? What is the relationship between novice teachers appreciation scores and their decision to leave the teaching profession; similarly, what is the relationship between competency scores and the decision to leave the teaching profession? What if there isn't a relationship between these job satisfaction factors and the decision to leave? While this study did not examine teachers' decision to leave the profession, nor whether participants planned to leave the profession, the question lingers: what aspects of novice teachers' jobs cause them to leave? Is part of the reason related to novice teachers' sense of appreciation and sense of competence?

One could argue that it makes sense novice teachers would feel less appreciated and less competent than their experienced counterparts. Regardless of the retention issue, teacher educators and school administrators must find ways to boost novice teachers' sense of appreciation and competence through professional development and morale building opportunities. Teacher educators must have teachers in the classroom who feel appreciated, not only by the stakeholders of their local school, but also by the profession. Encouragement of participation in professional organizations like the National Association of Agricultural Educators may be a way for novice teachers to feel more appreciated in the agricultural education profession; there are a number of recognition programs like Teachers Turn the Key that recognizes outstanding young teachers. Additionally, teacher preparation programs can have a greater stake in the in-service education of novice teachers and continue to provide the positive appreciation for teachers that comes from involvement in a teacher preparation program.

How can teacher educators help novice teachers feel more competent in the early years of teaching? Again, the involvement of the teacher preparation program in the in-service education of novice teachers may be a key in helping early career teachers feel competent in their teaching position. Unfortunately when a group of students completes the program, teacher educators often turn their focus to the next group of students, and while they do not ignore the program completers, or sever the relationship, the traditional model in agricultural education has been for the state department of education and the local school district to help novice teachers with their professional development needs. Times have changed, funding models have changed, and state departments of education have fewer staff members dedicated to agricultural education than in years past. This opens a great opportunity for teacher education programs to fill the need. While finances are an issue across institutions of higher education, teacher educators must think differently about how we can provide these services to our teachers. Recently the University of

Nebraska - Lincoln advertised a position for a faculty member of practice. The position duties include working with and for the state department of education. This is a different way of thinking about delivering services. Staffing models are just one way of helping novice teachers. Teacher educators must also consider program completers. Are teacher education students completers once they have met all of the requirements for teacher licensure, or are they completers when they leave the teaching profession (hopefully after a successful career as an agricultural educator)? How can teacher educators help guide individuals through the process of becoming a teacher from the day they enter the program through the end of their teaching career?

Questions related to the teacher retention issue remain unanswered. Future studies on teacher retention should examine novice teachers' intent to stay in the profession, ask novice teachers why they plan to leave the profession, and what can be done to keep good teachers in the profession. The perspective of the novice teacher must be kept in mind when looking to help good teachers become successful career teachers. Additionally, experienced teachers should be asked why they stay in the profession, their responses may help guide professional learning activities for mentoring, induction, and other professional development initiatives. Keeping track of agricultural educators tenure and reasons for leaving can provide valuable data to teacher education programs, local schools, and state and national agricultural education associations in an effort to help teachers feel more confident, efficacious, and satisfied with their jobs.

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Does the Ability to Manage Time Influence the Stress Level among Beginning Secondary Agriculture Teachers?

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Abstract

Monitoring the stress of teachers continues to be important – particularly stress levels of beginning agriculture teachers. The study sought to describe the relationship between beginning teachers' perceived ability to manage their time and their level of stress. The Time Management Practices Inventory and the Job Stress Survey were used to measure and collect the data. The study was comprised of 36 beginning secondary agriculture teachers in Missouri. A highlight of the findings suggests that beginning teachers tend to perceive themselves as good managers of time when compared to norm data. Additionally, on average, these teachers are not in a state of stress. Low to negligible relationships exist between the seven time management constructs and teachers' scores on the job stress, job pressure, and lack of support indices.

Introduction

The future of the secondary agriculture teaching profession lies with the recruitment and retention of effective, knowledgeable, and satisfied educators. Each year, novice teachers transition from their role as students to members of a professional community of educators. This group of new educators will encounter a plethora of new tasks, responsibilities, roles and challenges. While it is difficult to enter any career, agriculture teachers are expected to fill a variety of roles with no induction or training period (Wildman & Niles, 1987). According to Jensen (1986) and Marso and Pigge (1997), 50% of beginning teachers leave the profession before the end of their sixth year of teaching. What factors could lead to such a high attrition rate?

Roberts and Dyer (2004a) suggested that traditionally-certified agriculture teachers faced issues of attrition and burnout, an indication that teaching is a stressful and time-demanding job. New teachers are often overwhelmed with their newfound responsibilities (Fuller & Brown, 1975) and a primary concern with beginning teachers is a lack of time (Adams & Krockover, 1995; Cruickshank & Callahan, 1983; Myers, Dyer, & Washburn, 2005; Warnick, Thompson, & Tarpley, 2006). Chapman and Hutcheson (1982) found that teachers who were less able to organize their time were more likely to leave the teaching profession, and teachers who leave the profession often cited long hours as a reason for their departure (Moore & Camp, 1979). Time and stress appear to be highly linked, but is there a relationship between beginning teachers' ability to manage their time and their self-perceived stress level?

Few secondary agriculture teachers are immune to stress. Beginning teachers, in particular, are susceptible to high levels of stress and have little problem finding work to fill their schedules (Talbert & Camp, 1994). For many beginning teachers, feelings of frustration due to lack of time is a problem they must face (Britt, 1997; Mundt, 1991). Torres, Ulmer, and Aschenbrener (2007) noted that agriculture teachers typically have a greater workload and work longer hours than other secondary education teachers. It is, therefore, no surprise that beginning agriculture teachers experience a high-level of stress during the first seven or eight weeks of the school year (Joerger & Boettcher, 2000).

Review of Literature

The field of agricultural education faces a shortage of qualified secondary teachers to fill existing and future agricultural education program openings (Camp, Broyles, & Skelton, 2002; Connors, 1998; Kantrovich, 2007). The shortage is perpetuated by teachers leaving the profession early because they feel ineffective and overwhelmed (Bennett, Iverson, Rohs, Langone, & Edwards, 2002). The experience as a young teacher is different than that of a veteran teacher (Torres et al., 2007) and beginning agriculture teachers experience feelings of frustration, overwhelming problems, and “a multitude of insecurities and problems,” (Talbert & Camp, 1994, p. 35).

One of the greatest challenges facing beginning teachers is time management, and time is a critical resource for learning to teach (Wildman & Niles, 1987). One challenge with the management of time faced by beginning agriculture teachers was completing the daily work of a classroom teacher because new teachers dedicated more time to the preparation of classroom instructional materials than their experienced counterparts (Torres et al., 2007). Some novice teachers described their biggest concern of the first year of teaching as surviving in the classroom (Fuller & Brown, 1975; Kagan, 1992). Teachers described additional classroom stressors including completing required paperwork, meeting deadlines, and curriculum and lesson planning for multiple classes each day (Mundt, 1991).

In addition to classroom duties, the agriculture teacher was responsible for overseeing a variety of tasks in a comprehensive secondary agricultural program. These tasks included: managing student organizations, coaching competitive events, involvement in professional organizations, advising students on their Supervised Agricultural Experience (SAE) projects, and managing the agricultural program (Terry & Briers, in press). These additional responsibilities can quickly overwhelm the early career teacher. On average, the beginning teacher invested over 50 hours fulfilling these roles (Cole, 1981; Joerger & Boettcher, 2000).

Another time management issue for agriculture teachers was an effective balance between their home life and career. Teachers described problems associated with balancing personal and professional responsibilities, learning how to say no, and balancing quality time among different life roles (Edwards & Briers, 1999; Mundt, 1991; Mundt & Connors, 1999; Myers, Dyer, & Washburn, 2005). Other teachers described difficulty with identifying priorities and maintaining personal motivation and a positive outlook as issues pertaining to the balance of work and home (Mundt & Connors, 1999). Some teachers cope with balancing work and family by intertwining their personal lives and careers by involving their spouses in the agriculture program (Lambert, Ball, & Tummons, 2010).

Beginning teachers can face issues regarding a finite amount of time and infinite opportunities for work. However, the culture of agricultural education expects teachers to fulfill all roles competently regardless of time constraints (Lambert et al., 2010). In a Delphi study, Roberts and Dyer (2004b) identified characteristics of effective agriculture teachers as described by teacher educators, state staff, and current agriculture teachers. Characteristics of effective agriculture teachers included "puts in extra hours (p. 90)," "has an understanding and supportive wife/family (p. 91)," "effectively manages, operates and evaluates the agriculture program on a continuous basis (p. 90)," and "has excellent time management skills (p. 91)" (Roberts & Dyer, 2004b).

Both traditionally certified and alternatively certified teachers identified their greatest inservice needs to be in the area of professional development, including managing and reducing work-related stress, time management tips and techniques, as well as professional growth and development. Several authors (Heath-Camp, Camp, Adams-Casmus, Talbert, & Barber, 1992; Roberts & Dyer, 2004b) have recommended time management training as a means of addressing the stress of beginning teachers. In a study on preservice teachers, Woolfolk and Woolfolk (1986) found even a small amount of training in time management can have both an immediate and a long term effect on the performance of pre-service teachers. Furthermore, the participants of their study expressed excitement about training in time management.

Conceptual Framework

Macan (1994) provided a conceptual framework for understanding the complexity of perceived time control (see Figure 1). Macan described how one's perceived ability or inability to control time impacts a variety of outcomes (job-induced tensions, somatic tensions, job satisfaction and job performance). Macan's model suggested that these outcomes are not independent of each other, but, rather are intertwined. Individuals who perceived control over their own time were found to have less tension from school situations (Macan, Shahani, Dipboye, & Phillips, 1990). Those individuals also reported a higher perceived performance and greater satisfaction with both work and life (Macan et al., 1990).

Schuler (1979) proposed that "time management means less stress for individuals, which means more efficient, satisfied, healthy employees, which in turn means more effective organizations" (p. 854). This was reflective of the traditional thinking about time management; however, Macan (1994) argued that these outcomes were not necessarily linked to the time management behaviors. Macan proposed that the outcomes were operating through a perceived control over time by the individual.

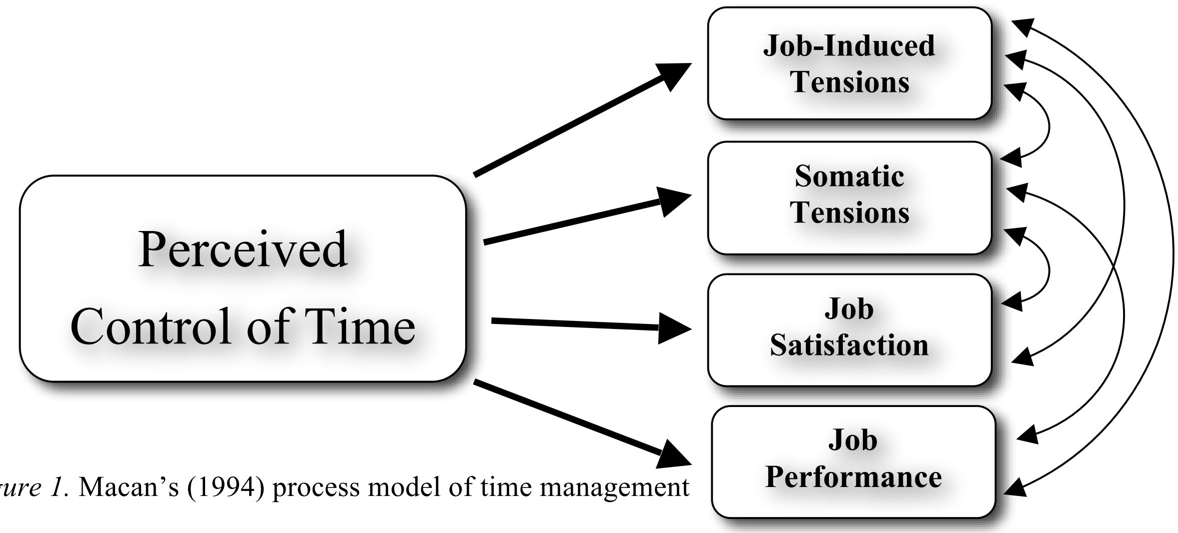

Figure 1. Macan's (1994) process model of time management

Purpose and Research Questions

The notion that teacher stress was somehow linked to time management practices led to the purpose of the study. Recommendations for time management intervention have been suggested as a solution to managing teacher stress. However, there is a lack of research in agricultural education which highlights the relationship between agriculture teachers' stress and their ability to manage time. In light of a shortage of teachers in agriculture and the interest to retain them in the profession, beginning teachers were the focus of this study. Thus, the purpose of the study was to investigate the relationship between time management skills of beginning agriculture teachers and their stress levels. The study was guided by the following research questions:

1.) What are the personal characteristics (sex, hours of work per week, teaching experience) of beginning agriculture teachers?

2.) What is the time management profile of beginning agriculture teachers?

3.) What is the job stress profile of beginning agriculture teachers?

4.) What is the relationship between time management and job stress of beginning agriculture teachers?

Methodology

This study was descriptive-correlational in design. The purposive sample of the study included all beginning teachers who participated in the induction program in Missouri during the 2008-09 school year (n = 36). The frame was obtained from the coordinator of the induction program.

Two instruments were used in the data collection process. The first was the Time Management Practices Inventory (TMPI) developed by Pfaff and Associates (2000). The TMPI was designed to provide a brief assessment of current performance in the key areas of time management: Setting Priorities, Resisting Involvement, Meeting Deadlines, Self-Confidence, Planning, Taking Action, and Paperwork. Pfaff explained each time management construct. The strategy of Setting Priorities involved developing a system that prioritizes activities and completes activities in order of importance. The strategy of Planning entailed being proactive and analyzing what needed to be done during the planning phase of activities. Taking Action involved determining the reasons for procrastination. Pfaff described Resisting Involvement as the inability to say "no" when tasks are presented. Paperwork referred to the forms and documents a person must deal with in their occupation. Meeting Deadlines referred to the basic courtesy of being on-time. Self-Confidence was another factor in time management. A low self-esteem can result in problems when trying to effectively manage time.

The TMPI was developed over a four-year period based initially upon a review of literature and then altered based on feedback from pilot test subjects. Factor analysis was used to establish the validity of the behaviorally-based statements. The TMPI contained 31 items and utilized a 7-point Likert-type scale; a response of "1" meant the person virtually never does what the statement describes; a response of 4 meant the person does what the statement describes one half the time, or sometimes; and, a response of "7" meant that one performs the behavior virtually always. The TMPI manual also provided normative data compiled from 435 managers, professionals, and office staff which was used in the comparison and interpretation of the results.

The TMPI measured time management using seven constructs. The constructs of Setting Priorities, Resisting Involvement, Meeting Deadlines, and Self-Confidence were summations of four items while the constructs of Planning, Taking Action, and Paperwork were summations of five items. The TMPI manual reported reliability estimates for the seven constructs (see Table 1). All of the constructs met Nunnally's (1978) established .70 threshold for reliability of items in social science research.

Table 1
Reliability Estimates on the TMPI

Construct	Cronbach's Alpha
Setting Priorities	.89
Planning	.90
Taking Action	.87
Resisting Involvement	.72
Paperwork	.71
Deadlines	.76
Self-Confidence	.85

Job stress data were collected using Spielberger and Vagg's (1999) Job Stress Survey (JSS). The JSS is a standardized, commercial instrument designed to measure job stress through perceived severity and frequency of stressful items. The JSS contained two sections. Section one sought to determine teachers' perceived level of severity of 30 common job-related stressors using a scale from 1-9; nine being the most stressful measure. The second section sought to determine the frequency with which teachers have encountered the job-related stressor during the previous six months using a scale that ranged from zero days experienced to more than nine occurrences in the last six months (0 – 9+). The two responses (severity and frequency) were used in various combinations to produce three stress index scores: Job Stress Index, Lack of Support Index, and Job Pressure Index. Index scores were calculated by multiplying severity scores by frequency scores. A third section was added to the questionnaire to collect sex, hours per week at work, and years of teaching experience. Both paper-pencil and electronic versions of the JSS were created.

Spielberger and Vagg (1999) reported that validity and reliability of the JSS were established through the results of previous studies. The creation of the instrument was detailed in the *Job stress survey: Professional manual.* Factor analysis was used to analyze construct validity of the items in the JSS. Alpha coefficients of .80 or higher were reported for all three index scales: Job Stress = .87, Job Pressure = .80, and Lack of Support = .80 (Spielberger & Vagg, 1999). The manual provided normative data for use in comparisons, and, for this study, the managerial professional normative data was selected because it most closely approximated the demographic of this study's teacher group.

Time Management data were collected online during the early part of January. One week after completion of the time management data collection process, the same group was used to collect job stress data. Two points of contact were used to collect the TMPI. All beginning teachers were sent an e-mail in January of 2009 with a link to complete the instrument online. Those not having completed the instrument one week later were sent a reminder e-mail with the same embedded link. A total of 32 (89%) participants responded. This exceeded the necessary 85% response rate suggested by Lindner, Murphy and Briers (2001) for representation of the sample, therefore, no further attempts to collect data were implemented.

The JSS was collected immediately following the TMPI data collection using the original frame of 36 teachers and utilized three points of contact. First, a paper copy was distributed with a self-addressed, stamped return envelope and a signed cover letter. Within two weeks, there were nine responses returned in the mail. At that point, for ease of response, the researchers launched an online version of the instrument and an e0mail containing a unique web link was sent to each of the participants. After one week, a reminder e-mail was sent which included the web link again. The online instrument yielded 24 responses total. One person completed both the online and the paper instrument. This yielded a total of 32 (89%) unique responses to the job stress instrument. To address objective 4, only participants who completed both instruments were used (n = 28; 78%).

Data were coded by the researchers and analyzed using SPSS (v. 16). Frequencies, percents, and measures of central tendencies and variability were used to summarize the data. Pearson-Product moment correlations were also used. Davis' (1971) conventions were used to label the effect size. These statistics are assumed to only hold true for respondents in the study and are not intended to be generalizable.

Results

Table 2 displays the personal characteristics of beginning teachers. Years of teaching experience was not a constant, as first thought (M = 1.52, SD = 1.39). In reality, the group had a range of experience from one to seven years. This appeared because the beginning teacher induction program was not just for first year teachers but was instead designed for all teachers completing their first year as an agriculture teacher in Missouri, or who have not previously completed an induction program. The group was split almost evenly between males (*f* = 18, 52.94%) and females (*f* = 16, 47.06%). All but one teacher was working at least 46 hours per week on average while two thirds of these teachers reported working more than 55 hours per week.

Table 2
Characteristics of Beginning Teachers (*n* = 34)

Characteristic	*f*	%	*M*	*SD*	Range
Sex					
Male	18	52.94			
Female	16	47.06			
Hours of work per week					
35-45	1	3.23			
46-55	9	29.03			
56-65	13	41.94			
66-75	5	16.13			
75+	3	9.68			
Years Teaching Experience			1.52	1.39	1 - 7

Note. Valid percents reported. Missing data

Table 3 reports the beginning teachers' time management scores as well as comparative norm data. The beginning teachers were above the norm data on all constructs. Teachers showed the highest mean on Meeting Deadlines (*M* = 5.92) followed by Self-Confidence (*M* =5.66), Setting Priorities (*M* = 5.59), Planning (*M* = 5.03), Taking Action (*M* = 4.67), Paperwork (*M* = 4.61), and, lowest on Resisting Involvement (*M* = 4.48).

Table 3
Time Management by Construct of Beginning Teachers (*n* = 32)

	Teacher Data				M/P Norm Data	
TMPI Construct	Grand Mean[c]	Mean Total	*SD*	Range	Mean Total	*SD*
Meeting Deadlines[b]	5.92	23.69	3.06	14-28	23.00	4.00
Self-Confidence[b]	5.66	22.66	3.03	16-27	21.00	3.50
Setting Priorities[b]	5.59	22.38	2.84	17-27	22.00	4.10
Planning[a]	5.03	25.13	5.36	14-35	23.00	7.00
Taking Action[a]	4.67	23.34	3.60	15-29	22.00	5.00
Paperwork[a]	4.61	23.06	4.10	14-31	21.00	5.00
Resisting Involvement[b]	4.48	17.94	3.23	9-23	17.00	4.00

Note. Possible maximum values = [a]35; [b]28; [c]Scale= 1-7

The stress information on beginning teachers appears in Table 4. Data at or above the 70th percentile indicates a stressed group. Beginning teachers did not meet that threshold on any of the three job stress indices. Teachers scored at the 52nd percentile on the Job Pressure Index (*M* =

25.51, *SD* = 8.77). The teachers were at the 41^{st} percentile on the overall Job Stress measure (*M* = 17.14, *SD* = 6.12). The teachers were at the 32^{nd} percentile on the Lack of Support Index (*M* = 11.48, *SD* = 7.90).

Table 4
Stress Indices of Beginning Teachers (*n* = 32)

Index	*M*	*SD*	Range[a]	M/P Norm Data
Job Pressure	25.51	8.77	3.30 - 40.90	52^{nd} %ile
Job Stress	17.14	6.12	2.83 - 27.37	41^{st} %ile
Lack of Support	11.48	7.90	0.50 - 28.00	32^{nd} %ile

Note. [a]Maximum value equals 81

Correlations were computed to investigate relationships between the seven constructs of time management and the three measures of job stress (see Table 5). There was one moderate correlation found between job stress and time management. This was a moderate negative correlation (*r* = -.36) between Self-Confidence and Job Stress. Four moderate correlations were found between Job Pressure and time management. Moderate negative correlations were found between Job Pressure and the constructs of Setting Priorities (*r* = -.43), Planning (*r* = -.35), Taking Action (*r* = -.36), and Paperwork (*r* = -.32). There were no moderate correlations with Lack of Support and time management; however, three low correlations were found. There was a low, positive correlation with Lack of Support and Meeting Deadlines (*r* = .11) as well as with Resisting Involvement (*r* = .28) while a low negative correlation was found with Self-Confidence (*r* = -.16).

Table 5
Pearson-Product Moment Correlation between Stress Indices and Time Management Constructs (*n* = 28)

	Job Pressure		Job Stress		Lack of Support	
TMPI Construct	*r*	ES	*r*	ES	*r*	ES
Meeting Deadlines	-.27	Low	-.07	negligible	.11	Low
Self-Confidence	-.50	substantial	-.36	moderate	-.16	Low
Setting Priorities	-.43	moderate	-.16	low	-.01	Negligible
Planning	-.35	moderate	-.27	low	-.05	Negligible
Taking Action	-.36	moderate	-.10	low	.06	Negligible
Paperwork	-.32	moderate	-.13	low	.09	Negligible
Resisting Involvement	-.27	Low	.01	negligible	.28	Low

Note. Usable paired data only

Conclusions/Implications/Recommendations

Beginning teachers represented in the study are split across male and female. While the average years of teaching experience is a year and a half, all teachers studied were in their first year of teaching agriculture in Missouri. The data suggests that a beginning Missouri agriculture teacher is putting in many hours in their job. In fact, 95% of beginning teachers responded that they are working in excess of 45 hours per week.

Among the time management variables measured, the beginning Missouri agriculture teacher, along with having high Self-Confidence about their time management ability is most capable of Meeting Deadlines and Setting Priorities. Perhaps the teaching profession has forced coping skills from these beginning teachers. Since they appear to be doing well in these areas, no intervention is needed.

However, they are least capable of resisting involvement at work and taking action. This suggests that beginning Missouri agriculture instructors have difficulty saying "no" to additional responsibilities and may tend to procrastinate. They also struggle with Paperwork. This supports findings from Torres, Lawver, and Lambert (2009) which showed that excessive paperwork was a high stress item for teachers in both Missouri and North Carolina. Focus should be given to the areas of resisting involvement, paperwork and taking action. Teachers should learn to say no. They also need to learn how to delegate when they have too much work and do not have the capacity to meet the demands place upon them. Utilizing volunteers, students, parents, and community members will help spread the workload. They should also work to minimize the amount of paperwork and implement strategies for managing correspondence. One strategy for taking action is to divide large projects into achievable steps with deadlines. They should use their skills in setting priorities to guide the tasks they choose. Perhaps they are procrastinating because the task does not fit within the teacher priorities for the program. This understanding and assistance could occur in a teacher preparation program for traditional teachers and could occur during the induction or mentoring program for non-traditional teachers.

While there is room for improvement and calls for intervention may be appropriate, it should be noted that compared to the normative data provided by the TMPI (2000), beginning agriculture teachers in Missouri tend to be more effective at managing their time. These beginning teachers scored higher than the normative data on each of the seven constructs measured. Does the structure of teaching school force beginning teachers to become good managers of their time? Perhaps the six months of teaching experience for our average respondent has in some way sensitized the need for time management.

When looking at the stress profile for these beginning teachers, it is important to remember that most teachers were working in excess of 55 hours per week. According to Torres, Lambert, and Lawver (2009) this should be a predictor for stress. Despite the long hours beginning teachers work, they have not crossed the stress threshold (70^{th} percentile) in the stress indices of Job Pressure (52^{nd} percentile), Job Stress (41^{st} percentile), or Lack of Support (32^{nd} percentile). There are several possible arguments for why this group of beginning teachers was not stressed. Perhaps, there is still some novelty, having only been in their teaching positions for about 6 months and they are still carrying around the "superhero" mentality that they can do anything. Perhaps at this young stage of their career they are not yet dealing with a lot of family-oriented stress at home with which later career teachers may have to contend. Or, more likely and perhaps, this underscores the effectiveness of the beginning teacher/mentoring program in Missouri. Should this be the case, all beginning teacher should be encouraged to actively participate in the Missouri beginning teacher/mentor program. However, this program only includes teachers in their first or second year in Missouri. State staff should encourage an informal mentoring process for early career teachers outside the limits of the induction program.

Correlations checked for a relationship between time management skills and job stress. There was a moderate, negative correlation between Self-Confidence and Job Stress indicating that the higher a person's self-confidence as a manager of their own time, the lower their stress levels will tend to be. Perhaps supervisors should consider the confidence level of novice teachers in targeting those in need of additional support and attention. Additionally, the State should offer professional development activities that continue to develop confidence among novice teachers. And, of course, the novice teachers need to continue to receive verbal reassurance that their experiences are normal and that all teachers share their feelings. They should also be reassured of their performance and praised for a job well done.

Also interesting was the finding that there did not appear to be a strong link between time management skills and feelings of support from the teaching profession. This could stem from the fact that the teachers felt an overall high level of support. However, the most obvious link among stress and time management was that there are more substantial and moderate correlations between Job Pressure and time management than with any other index of stress that was measured. This indicates that the higher the time management skills of the individual, the better they will be at handling the job pressure associated with teaching agriculture. This is yet another finding to support the benefits of time management as a skill for future teachers. Professional development specialists should emphasize the importance of time management as a coping strategy for job pressure.

The findings and conclusions herein do not definitively portray the characteristics and associations of all beginning teachers; they simply serve as a point of reference. Additional research should be undertaken to confirm or refute the results of this study. Additionally, research should be conducted with a larger sampling of beginning secondary agriculture teachers from across the country. Furthermore, while there are many factors pertaining to teacher retention, level of stress often times is complicated by alternative explanations. Researcher should continue to dissect the problem area for antecedents to stress levels. These data should be closely inspected to provide meaningful interventions and assistance to new teachers.

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The Role of Collaboration in Secondary Agriculture Teacher Career Satisfaction and Career Retention

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The teaching profession is not without its share of challenges. Often, these challenges seem insurmountable and for some professionals, they are. Teachers have been entering the professional ranks only to turn right around in search of the nearest exit. However, despite the exodus teacher socialization has been shown to improve their professional outlook. The National Research Agenda has identified research into teacher retention as a priority area. In this phenomenological study, nine interviews were conducted with three experienced secondary agriculture teachers. Two questions guided the research: (1) How do experienced secondary agriculture teachers perceive the role of teacher collaboration in their career satisfaction and retention and (2) How do experienced secondary agriculture teachers experience the role of teacher collaboration in their career satisfaction and retention? Findings suggest greater career satisfaction was an important product of their interaction and may be effective in addressing the challenges of teacher dissatisfaction, leading to greater teacher retention.

Introduction and Theoretical Framework

Teaching is described as an uncertain profession, a condition which "fuels a teacher's dissatisfaction" (Johnson & Birkeland, 2003, p. 584). Shrinking budgets, rising expectations, growing learning demands and a less than flattering image perpetuated by the media are all well-documented challenges to the teaching profession (Greiman, Walker, & Birkenholz, 2005). As if those issues weren't enough to overcome, the culture of most schools can be described as isolationist (Gersten, Gillman, Morvant, & Billingsley, 1995) meaning teachers suffer alone rather than reach out to their peers for support. Unaddressed, such issues are often threats to a teacher's career satisfaction and ultimately their willingness to remain in the classroom (Ingersoll, 2001a; Johnson & Birkeland, 2003). Agricultural education has mirrored the discipline at large by suffering through its own teacher shortage trend (Kantrovich, 2007). The retention of quality teachers is an outcome important to students (Joerger & Bremer, 2001) and schools (Ingersoll, 2001b) alike. Many factors are found to contribute to a teacher's decision to remain. Among them, researchers have identified the social aspects of teaching to be major contributors related to keeping teachers in the classroom (Boone & Boone, 2007; Hargreaves, 2001).

Networks, teams, groups, mentoring relationships, and other teacher socialization structures encourage individual teachers to forge relationships with those in the collective whole (McLaughlin & Oberman, 1996). Hargreaves (1994) suggested collaboration and collegiality have the power to help teachers develop throughout their careers. Collaboration and collegiality are also credited with motivating teachers to return each year (Boone & Boone, 2007) and have been recommended as ways to combat isolation (Greiman et al., 2005; Williams, Prestage, & Bedward, 2001). Connectivity pulls teachers from their classroom islands and places them in the school interface, having them support one another through the actions of sharing and problem solving. When the interaction is based on the needs of teachers' work it is considered important and useful (Feiman-Nemser, 2001), renewing their "sense of purpose and efficacy" (Lieberman & McLaughlin, 1996, p. 63).

Teacher collaboration is one such tool involving the coordinated work of individuals toward a common goal, often based on a common "history and culture" (Dooner, Mandzuk, & Clifton, 2008, p. 2). Hargreaves (1994) described the culture of teacher collaboration as "spontaneous, voluntary, development-oriented, pervasive across time and space, and unpredictable" (p. 192-193). Touted as the cure-all for teacher isolation, student performance, and professional development (Brownell, Yeager, Rennells, & Riley, 1997; Goddard, Goddard, & Tschannen-Moran, 2007); teacher collaboration has the potential to increase professional commitment among teachers and positively impact their career satisfaction (Johnson & Birkeland, 2003; Weiss, 1999). Despite these benefits, teacher collaboration is not common practice in many schools (Rhodes & Beneicke, 2002).

A case study of teacher induction exposed the school cultures within which new teachers found themselves working (Williams et al., 2001). The data collected were used to establish a continuum of school cultures ranging from a culture of individualism, to one of structural collaboration, to one of spontaneous collaboration. New teachers experiencing an individualistic culture, planned to terminate their employment and seek work in a new school due to the physical and philosophical distance they felt from other professionals. In the schools with a structurally collaborative culture, new teachers were provided formal opportunities for development. These opportunities were based on programmatic requirements and often resulted in meeting the needs of the program rather than those of the new teacher. Finally, the spontaneously collaborative culture placed new teachers in an environment where collaborative opportunities evolved in the moment. These opportunities were shared among the faculty, rather than distributed by leadership. Experiences related to this type of school culture generated the greatest levels of career satisfaction.

Johnson and Birkeland (2003) examined school organization and its impact on a new teacher's willingness to stay in teaching and at their current assignments. Teachers who often moved to new schools did so in search of schools with a collaborative and collegial culture. Those who remained at their schools did so because teacher collaboration was encouraged. The culture of collaboration is said to have generated greater teacher career satisfaction and ultimately greater retention of new teachers following their first year in the classroom.

Gehrke and McCoy (2007b) found the interaction beginning teachers experienced with other professionals was said to have provided them with emotional support, broadened their educational focus beyond mere survival, and taught them how to maintain high expectations. These elements contributed to the participants' generally positive regard for the profession and were important to their decisions to remain in teaching the following year.

Boone and Boone (2007) addressed the issue of teacher retention in agricultural education from the perspective of why teachers continue to teach. The study examined the factors compelling 53 agriculture teachers in West Virginia to teach and draw satisfaction from their work. Among those motivational factors was the professional brotherhood in the agricultural education profession. The appearance of community demonstrated its importance throughout the career and the degree to which teachers valued the impact this collaborative component had on their willingness to remain in the profession.

The impact of teacher collaboration in other content areas and grade levels has been shared (Goddard et al., 2007; Hargreaves, 2001; Williams et al., 2001) but agricultural education literature offers relatively little on the matter. The unique structure of the agricultural education program model presents agriculture teachers with the expectations of teaching classes, advising an FFA chapter, supervising SAEs, and managing the inner-workings of the program (Talbert, Vaughn, Croom, & Lee, 2007). These additional responsibilities are not expected of teachers in other areas (Greiman et al., 2005; Walker, Garton, & Kitchel, 2004) and can potentially lead agriculture teachers "to a lack of self-confidence, confusion, frustration, and isolation" (Fritz & Miller, 2003, p. 47) should they be ineffective at completing them. Ineffective performance of such responsibilities is known to contribute to increases in teacher shortages (Boone & Boone, 2007; Greiman et al., 2005).

Purpose

High rates of teacher turnover have beckoned researchers to examine the issue of teacher retention. According to the National Research Agenda (Osborne, n.d.), generating qualified, motivated candidates ready to facilitate student learning is a research priority. The purpose of the study was to describe the phenomenon of teacher collaboration from the perspective of three secondary agriculture teacher participants. The following questions guided the research: (1) How do experienced secondary agriculture teachers perceive the role of teacher collaboration in their career satisfaction and retention and (2) How do experienced secondary agriculture teachers experience the role of teacher collaboration in their career satisfaction and retention?

The participants represented a small sector of the agriculture teaching population. The Life Cycle of a Career Teacher model (Steffy, Wolfe, Pasch, & Enz, 2000) was used to identify teacher participants. The mid-career secondary agriculture teachers from Florida were defined as those teaching at around the 15 year mark. They provided a glimpse of teacher collaboration from that point in the teaching career and prior. Including teachers from other phases of the model may have provided additional information about what teacher collaboration is for a teacher experiencing that phase at the moment. However, by selecting teachers in the expert and distinguished phases, the researcher used the participants' ability to reflect on a greater number of professional experiences to capture a picture of teacher collaboration over the course of a career.

Methods

The highly individualized research focus lent itself to qualitative methodology and, more specifically, the phenomenological research approach. Phenomenology seeks to discover both what is happening in the lived experiences of participants and uncovers the meaning participants have drawn from such experiences, to identify the essence of the phenomenon and how it relates to others (Moustakas, 1994). Phenomenology casts off inherited meaning and places one's perceptions aside to receive experiences in a new way (Crotty, 2003). This new way of seeing the phenomenon results in richer, more all-encompassing meaning.

The standards of rigor related to the study were addressed through accepted qualitative means (Ary, Jacobs, Razavieh, & Sorenson, 2006). Credibility addresses the level of confidence one may have for the study's findings. The researcher completed a thorough subjectivity statement, identifying any previously held biases related to teaching, collaboration, and career satisfaction. Transferability addresses the study's potential generalizability. Through rich description of participants and their professional contexts, the study may be paralleled to similar groups. Dependability is the study's consistency. The researcher maintained an audit trail, detailing the decisions made throughout the study. Confirmability relates to the degree to which the researcher was able to control bias. In this study, the researcher utilized member checks and peer review to ensure decisions made were data driven rather than researcher driven.

Criterion-based sampling was used to select participants. An expert panel, comprised of agricultural education faculty, identified potential participants based on their reputation as collaborators with other teachers and whether they were in the expert and distinguished phases of the Life Cycle of a Career Teacher model (Steffy et al., 2000). Three participants were selected for the study and one participant was selected to pilot-test the interview guide. The Seidman (2006) interview technique was chosen, resulting in a series of three interviews of each participant with nine total interviews comprising the study. Each interview lasted approximately one hour. The goal of the first round was to reveal a focused life history of participants relative to the phenomenon. The intent of the second interview was to draw out details of the participants' experiences with the phenomenon. The third was meant to prompt reflection about the phenomenon. A semi-structured interview guide was generated then reviewed by a panel of experts. Participants were contacted by email and the four recruited participants received further correspondence. The interview protocol was piloted and later refined. The time between interview rounds with each participant averaged 2 weeks.

Immediately following interviews, transcripts were generated verbatim from digital audio recordings. Transcripts were cross-checked with field notes and recordings and given to participants to check for accuracy. Data were analyzed using the modified Stevick-Colaizzi-Keen method of phenomenological data analysis (Moustakas, 1994). The researcher began the process by reviewing the subjectivity statement and open-coding each transcript. Themes were generated from the open-codes and textural statements involving the grand elements of the phenomenon were developed for each interview series. The researcher went back to the transcripts seeking to describe how the experience happened for the participants through structural statements for each interview series. Composite textural and structural statements were created across participants and finally a textural-structural statement was formed synthesizing all collective meanings and essences of the phenomenon.

There were perceived limitations to the study and measures were taken to minimize them. The risk of the researcher leaking personal biases into the work is an ever-present limitation. The researcher was careful to bracket personal biases by engaging in Epoche, placing all related beliefs on hold throughout data collection and analysis (Moustakas, 1994). A variety of strategies were implemented to protect the purity of participant data. The researcher made use of member checks, peer review, and wrote a thorough subjectivity statement.

The following descriptions are formed from the series of interviews with three agriculture teachers, referred to as *Kevin*, *Christy* and *Mark*. Due to page limitations, brief individual textural and structural descriptions are included which highlight key collaborative experiences related to teacher retention.

Kevin's Individual Textural Description

Kevin has been a classroom teacher for 16 years, with much of that time spent at his current post. His first collaborative experience occurred when he arrived at the university and pledged membership to an agricultural fraternity. It was there he met another agricultural education major named *Carl*. The two often discussed the teaching profession. "We were talking a lot. We had a lot of discussions about the philosophy of agricultural education." The freedom and the breadth of subject matter available to students at the university often challenged their decisions to teach. To have another with whom he could talk about important issues helped Kevin maintain his focus in the major.

After a number of years of teaching at the school he attended as a student, Kevin took a job at a school in a different county, teaching outside of his academic expertise. He was initially hired for a science teaching position and was promised movement into the agriculture department as growth occurred. Hesitant at first, Kevin accepted the position and linked with the science department chair for support. Respect and trust quickly transformed their interactions into strong collaborations. The two shared resources, curriculum and time.

> With the university summer science workshop series, I would come back with notebooks and she wanted to go. She has never looked down [on agriculture] and said, 'Oh, you need to do more science.' She would look through the materials for ideas to use and teach agriculture in a scientific method or other laboratory.

For quite some time Kevin yearned for connection with other agriculture teachers as a way to challenge himself. His involvement with the Agricultural Education Leadership Program presented one of the most powerful events for collaboration with teachers outside of his teaching partnership. The fifteen program participants engaged in extensive conversations about their experiences within the profession and life in general. These informal interactions helped Kevin feel more comfortable with the idea of working with others.

His specific interactions and conversations with *Margie*, a program participant, yielded an especially powerful connection neither had expected. They discovered the differences between their characteristics led them to create a very strong bond. This bond was utilized and tested as Kevin and Margie began the distance master's degree program. The faculty often encouraged the cohort to consult one another should they need additional assistance with studying. Additionally, many of the assignments associated with the coursework were to be completed in pairs or small groups. In describing their relationship, Kevin shared,

> Talk about collaborating. I got to collaborate with this really neat lady, Margie. I think we became excellent, excellent partners and I never really knew her before. We are really different but we are also really alike and we tease each other. We say we are the Yin and the Yang. She forces me out there and I pull her back just enough to make sure she's composed and everything is exactly the way we want it. On the KAI [Kirton Adaptive

> Innovative tool], she was at the very front of the line [Innovator] and I was in the very back of the line [Adaptor]. That is when we said, 'Okay, we're partners.'

They worked together throughout the graduate program but their partnership did not end with commencement. Their collaborative relationship extended to other projects. Margie encouraged Kevin to participate with her in the career and technical education professional association "because she thinks there is something I can offer." Most recently, Kevin, Margie, and Mr. Peterson worked together on a state agricultural education license plate program. The trio shared ideas among themselves to ensure their roles contributed to the program's success. They credit the key to their success to the fact no one was "out looking for credit. It is a matter of being involved and helping where we can."

Kevin's Individual Structural Description

Kevin's perceptions of teacher collaboration have changed as he developed as a teacher. During the preservice and induction periods of his teaching, he had the greatest professional need for mentorship. He needed the opportunity to develop the knowledge and skill sets necessary to become an effective teacher. "I wasn't really concerned about trying to collaborate. …I was just struggling." The majority of Kevin's collaborative interactions with other professionals tended to be within a mentor-based capacity. His needs were often the focus of their time together.

When Kevin moved to a new school, he had already been teaching a number of years. "By the time I got here [to this school], I think I was able to collaborate more because it wasn't as much of a survival. It was kind of a branching out into a new territory." The collaborative actions between Mrs. Lawtey and Kevin included sharing resources for classes, serving as field trip chaperones, and sharing professional development materials. While still rather limited in his perspective, he did find himself on a more level playing field as Mrs. Lawtey did not "look down" on him or his efforts. Rather, she expressed a desire to use the ideas in her own teaching.

Kevin's associations with Margie further pushed his collaborative notions to include larger projects, different audiences, and new opportunities for learning together. Born of informal social time within a structured professional development program, and grown through continued interaction, the bond between Kevin and Margie was firmly established. Their deep awareness of the talents, skills, and personal qualities the other possessed let them each use their strengths to pursue new challenges together. Much like his relationship with his teaching partner, Kevin's relationship with Margie yielded positive results and helped him to become more comfortable working with others. The collaborations had a maturation effect on Kevin as he has been able to focus on the issues impacting the agricultural education profession, rather than those which only affect him. They also helped him to settle into his position and feel fulfilled for the first time.

Kevin has valued the impact of teacher collaboration on his professional career saying it has made it more enjoyable. Once he passed the stage where survival was his main objective, he wanted more from his career. Every collaborative experience he mentioned having was positive involving little to no resistance. Any resistance he did encounter came from within as he tried to work out his personal challenge of reliance on others. Kevin described his personality as "very positive" and he mentioned he was "always smiling and saying positive things" and "having a hard time saying, 'No.'" He perceived these characteristics as attractive when working with others yet often downplayed his role in initiating collaboration by crediting his experiences with being with the right people, in the right places, at the right times. His willingness to collaborate with other teachers helped him create a reputation as a collaborator and arrive at a place in his professional life where potential collaborations generally tend to find him without him having to seek them.

Christy's Individual Textural Description

Following her student teaching experience, Christy was hired to teach in a middle school. The mentors and teams with whom she was matched provided some assistance, yet not for every aspect of her varied appointment. Since she was the only agriculture teacher in the school, she had to look to the other teachers in the county for content-specific camaraderie. However, being the only teacher who was young and female made it difficult to fit in. She recounted, 'There was nobody. They all had been teaching for quite a while. They were nice enough but they were not overly friendly to help.' She listened during the county-wide agriculture teacher meetings but was too insecure to ask clarifying or follow-up questions. It was a very lonely time.

At the completion of her fifth year, she accepted a position in a two-person department at the high school. That same year, another female was hired to the opening she left at the middle school, and another high school in the county hired a woman to fill that vacancy. The following year her closest collaborator, *Shana*, was hired to yet another position. The wave of young female teachers presented Christy with professionals with whom she could identify.

> We had somebody to sit with at the ag teacher events. The first year we were all together it was basically work-related collaboration. We talked about 'This is what works for me' and 'This is what we do.' Then we got to be friends and had some outside work contact which solidified the group. We then started talking about things that were work-related but that you probably wouldn't just talk about with your acquaintances. We talked about what we could do to make things different and better, things outside of our classrooms.

Christy's relationship with this group of agriculture teachers continued to progress, leading to a number of changes in her work. "We kind of felt out of the loop sometimes so we figured we would do some things that would let our kids get some benefit. We felt the more we knew the better it was going to be for them. We worked together." She had always been a dues paying member of her professional association but had never been a participant. "So, our little group decided we were going to try to get more involved in that kind of stuff. And we did!" She became a member of the state FFA board while another in the group was elected to a leadership position on the state agriculture teachers' association board.

Even as two of the four key teachers left the collaborative group, new ideas for working together emerged with one effort leading to another.

> Working to get on the boards led to the whole curriculum stuff and everything we do now. You get so much from exchanging stories but when you sit down and start to work on a project with someone you can get a lot accomplished. There is a lot that can happen. In fact, I don't think I would have done the whole master's thing if I hadn't had the friends to do it with.

Christy introduced the idea of completing a distance master's program to the group by telling them, "We need to do this." She was able to coerce Shana into applying to the program by telling her, "We ought to take everything we can get." The graduate program encouraged collaboration among students so Christy and Shana worked together whenever they could, studying and completing assignments as a team.

> We did all of our stuff together. Anything we could work together on, we did. When you don't have the teacher and you only have a computer screen with a PowerPoint presentation from which to get the information, you need to be able to talk to someone. If I hadn't been able to talk it out with someone it [success] wouldn't have happened.

To get the most out of their collaboration they often met face-to-face, taking turns driving to the other's home or school to work on assignments.

Extending their efforts to the classroom, Christy and two of the county agriculture teachers in her collaborative group decided to complete a grant application related to the horticulture classes they taught.

> We're not big grant writers. Our county supervisor found this grant and he said, 'Okay, what do we want to do with this?' We thought of some things that were important and we wanted to try to do. We wrote them out as a group and then gave it to the county grant writers to polish. We got the money so something must have worked.

With funds available, the group worked together to align their course curriculum with the state horticultural industry association's professional certification test. This feat required the team to amend their current curriculum by going deeper into some concepts on which they provided only a surface orientation. They also developed new lesson plans for those areas not currently addressed. The three worked together to plan and facilitate industry, research and university tours to enhance the classroom experience for their students. The work required the three to stay in close contact. Christy said, "I don't know a week that goes by that we don't talk by email or on the phone. I might talk to them more than I talk to Bill [her teaching partner]!"

Christy's Individual Structural Description

Christy's professional development has been profoundly impacted by her collaborative associations. The mandated collaborative teacher team structure infused within the middle school presented Christy with a dichotomy. On the one hand, the experience allowed her to work closely with teachers from other content areas on school issues. On the other hand, the demanding meeting schedule and arbitrary assemblage of elective teachers presented a rigidity which did not serve her best professional interests. Despite her inability to access the help she needed related to her specific subject-area responsibilities, she felt isolated as no teachers or administrators on her campus could provide her with the direction she desperately needed. Her unwillingness to ask for help resulted in major challenges related to county paperwork. As a result, she made a number of mistakes which could have been avoided had Christy taken the initiative to approach another agriculture teacher in her county.

In Christy's defense, the county agriculture teacher culture seemed closed. Her first experience in their company was intimidating. Although polite, not a single teacher offered himself to her as a resource. "I think some of it is probably to a certain extent, sticking it out long enough to become one of the group. If you are around a little while longer, then you kind of get accepted into the fold." She felt out of place; a stranger in a foreign land. At the county agriculture teacher meeting, she also felt as if the presenter was speaking in a secret language since she appeared to be the only one who did not understand his comments. The danger of the situation stemmed from its timing. Christy was just beginning her career in agricultural education and rather than a warm welcome, she got a chilly reception. Furthermore, the loss of mileage reimbursement due to her paperwork error provided another reason to reconsider her career choice.

Christy admitted feeling restless many times during her 16 years of teaching but her associations with other teachers helped her find reasons to stay.

> I got to a point where I felt I wasn't as happy as I could be if I had another job. There is a certain amount of, 'It is the same job even though you have different kids every year.' I questioned if I wanted to stay in teaching. These people came along at the right time for us to work together and that has probably kept me here.

Moving from a one-teacher agriculture program to a program with two teachers brought the potential for daily collaboration on local school and program-related issues; a void she experienced during her previous five years at the middle school. Although they were very different individuals, each shared a commitment to the success of their program and actively worked to make sure both voices were heard while managing its activities. Her leadership work in professional associations came from discussions among her group of teacher collaborators and resulted in opportunities to continue their learning. She willingly and voluntarily took part even though each required additional commitments of her time. The fact these events presented her with the personal and professional motivation needed to make her work challenging, stimulating and rewarding was enough reason for her to maintain her commitment to agricultural education.

Mark's Individual Textural Description

Mark majored in agricultural education at age 33, after a ten year career in banking. From the very start he approached his second bachelor's experience much differently, relying heavily on collaboration with others. Following his teaching internship, Mark was hired to the school where he is currently employed. His first day on the job, the custodian told Mark he had a broken well on his land lab. Mark worked hard to navigate the school's process of work orders and proper channels to repair the pump which proved to be immediately and deeply frustrating. Mark summarized the event by saying, "It was at that point I knew I needed to get help in a lot of areas in order to make things work in this environment."

He was on the right path with this line of thinking as his tenure within the school community got off to a rocky start. Mark was the fifth teacher the program had seen in just three years. There were very few teaching and learning resources available and he faced a number of student management issues. He often wondered if he had made the right decision to enter the career.

> It was rough! I was called to the principal's office I don't know how many times. I was accused of [things] and the mom was going to sue. Kids would run by my house shouting. Our teams never did well, or didn't do as well as I thought we could have. I blamed it on these kinds of kids coming in.

Aware change was needed, he began asking other agriculture teachers what they did to get results. "I don't know if it is just Florida or if it's just guys in particular but they keep their cards close to their chests. They really don't share anything." A visit with a teacher in a nearby county landed him a wealth of information. Mark continued to follow each lead, creating a literal chain of collaboration. This chain led him to craft additional networks dealing with the FFA aspect of his professional responsibilities. Met with success in his quest for collaboration, he continued to pursue "like-minded teachers" who were willing to be open and share their expertise. Mark asked *Adam*, another agriculture teacher, why he was so willing to share.

> He told me, 'Mark, I don't care who you are. If you want to learn, I'll teach you because when we beat you I want to make sure we beat the best. And if you beat us it's because you've beaten the best.' With that, I began to seek out and socialize with other teachers at different conferences and events who were like-minded.

Mark's experiences with teacher collaboration have resulted in his development as a teacher professional. His students have won state and national awards, he has demonstrated change in his classroom practices and he was even approached by administrators for promotion in his district. The successes often presented him with the dilemma of whether or not he should remain at his current school, transfer to another department in the county, or move into school administration.

> People recognize my leadership skills down here [in the agriculture department] and suggest they could be better utilized in management. I spent about fifteen, twenty minutes down at the front office. I come back here [to my classroom] and I am so happy to be back within my four walls and to hug my kids.

Rather than making the decision as to whether or not he would stay at the school on his own, Mark chose to seek the input of those with whom he worked closely.

> When they opened up *Byer High*, I was heavily recruited to go out there and open up that program. I really liked the principal that was going there and the idea of brand new everything so I called Adam. I said, 'Adam, what do you think about this?'… He had a good answer. So when they [county administration] opened up the new middle school and said, 'Hey, Mark! What do you think?' I said, 'Nah, I'm fine. 'Bout got this place the way I want it.'

Mark's Individual Structural Description

Mark's perceptions of teacher collaboration were largely shaped by his core beliefs that no man is an island and that people are made stronger when they work together. These beliefs were not appreciated in his first career so he set out to find a place where they would be. Opting to attend the university allowed Mark access to other pre-professionals with whom he was able to network, learn, and grow. The experience made him feel integrated to the profession prior to taking his first teaching job. "It kind of started from there [collaboration with the cohort] and then developed from there."

His first experiences as a high school faculty member let Mark know how much he didn't know about meeting the responsibilities associated with his role as an agriculture teacher. "They teach us this much, on that many subjects." The work order situation demonstrated his lack of knowledge about school protocol, something impossible for new teachers to know until they infiltrate a particular school system. Frustrated by this and other barriers, Mark realized he needed help.

> There is no way you can do it all. …I realized that when I was trying to fix everything to try to teach, it was going to take a lot more than what I had. So I had to win friends and influence people to get something to work. It was a chore.

Guided by his core beliefs and the curiosity about how other schools achieved success, he made his teaching a priority and looked up those teachers with whom he formed lasting connections during his teacher education program. They were happy to help by sharing resources, contacts, and tips for success. "You just go and ask questions and for the most part people will help you because they are flattered [you asked]."

Thrilled with his initial successes in teacher collaboration, he looked to other areas of his teaching responsibility; namely the areas of FFA and SAE. Mark's willingness to sit down with other teachers at professional activities was a fruitful beginning to expanding his efforts. He chose to discuss professional goals, challenges, and issues rather than engage in small talk or, worse yet, withdraw from their company.

> The teachers with whom I collaborate are teachers that I gravitate toward. …So the conversation starts in a big group to begin with but then they kind of break off into smaller groups of interest. The ones that are so busy telling you what all they have done usually go off and brag to each other.

From the moment he chose to engage in this new career path, Mark was able to humble himself and move beyond the profession's culture of skepticism and competition. He chose to adopt more open educational philosophies, like those shared by Adam, and model his personal beliefs for others rather than solely worry about how his students would place in a CDE. As a result, many teachers felt comfortable coming to him and letting him know how he could help them, especially those early in their careers.

> I think it is the younger ones that are more easily approachable and are more willing to share. So many of them have come through a program where they had an icon of a teacher, that taught for 20 or 30 years, that had every answer or gave the kids the impression they had every answer. They feel bad and don't have the confidence level they think they should have.

Since his career in agricultural education followed a ten-year career in banking, Mark had a professional maturity well beyond that of other beginning teachers. His experiences with teacher collaboration helped him develop still further. As Mark moved closer to the midpoint of his teaching career, this maturity presented him with options for his future. The opportunities, while tempting, came as a result of the success he brought to the program and the depth of his professional development. Because of his great respect for Adam as a professional and friend, Mark did not hesitate to seek his input for helping him make a decision about his future in teaching. This bond between Mark and Adam was based on trust, forged with common values and shared history. A connection with such stability and meaning was instrumental in Mark's decision to remain as a contributing member of the agricultural education profession.

Findings

Individual textural and structural descriptions were examined for all three participants to form composite textural descriptions and composite structural descriptions. Those descriptions were then used to form the textural-structural statement, providing the universal essence of teacher collaboration in the context of career satisfaction and retention within this participant pool. The essence can be distilled as

Textural-Structural Statement

Collaboration reduces the isolation teachers often experience. Although surrounded by students, teachers are separated from their peers for a considerable part of the day. This leaves them unable to seek assistance with their pedagogical and content concerns during that time, often when they need it most. Collaboration is a valuable tool for socializing teachers. It removes the barrier of the classroom walls and draws teachers together in a variety of contexts. Whether through meetings, workshops, down time at CDEs for students, or even conferences, collaboration helps teachers get to know one another and advance their relationships beyond the acquaintance stage. Establishing connections with others provides teachers with the emotional support critical to helping them work through a variety of professional challenges.

Collaboration among teachers increases their career satisfaction. When teachers interact regularly on the basis of their common professional connections, they develop familiarity, understanding, and tolerance for one another and for their work. Collaborative activity increases the levels to which teachers are engaged in their career responsibilities and are committed to developing and maintaining viable agriculture programs. Furthermore, collaboration impacts the degree to which teachers are invested in the overall profession. These elements contribute to a teacher culture which is supportive of teacher growth and development. Through collaboration, a teacher may even receive help in making decisions about their careers; including changes to their pedagogical practice and whether or not they will persist in the career.

Two research questions were pursued in this study. The first inquired as to experienced secondary agriculture teachers' perceptions of teacher collaboration as it related to their career satisfaction and retention. At its essence, the phenomenon of teacher collaboration involves connection with a purpose. Teacher collaborators have within them the desire to make education better for teachers and students alike. Collaboration lets teachers band together, not just to talk about solutions, but to make things happen. Much more than time for teachers to get to know one another, teacher collaboration provides teachers with real opportunities to feel more capable and rewarded. Collaboration requires investment and hard work. It motivates teachers to dig deep within themselves; to question, to challenge, to risk, to share, and to be diligent in such pursuits.

The second research question asked how experienced secondary agriculture teachers experienced teacher collaboration related to their career satisfaction and retention. At some point in their careers, teachers come to a place where they want more than they have done, or are able to do, alone. Collaboration with other teachers affords them the opportunity they need to achieve a higher level of performance for themselves, their students, and their profession. Teacher collaboration occurs through both spontaneous and structural avenues but a teacher's preservice teacher education program is often his or her first encounter with the phenomenon. Teachers who actively collaborate treasure opportunities for informal interaction. Such moments not only allow prospective collaborators to find one another, they help form friendships resulting in lasting partnerships. Teachers' experiences with collaboration are key contributors to their career development, satisfaction, and commitment.

Conclusions, Implications & Recommendations

Agricultural education finds itself locked in the national teacher shortage trend (Kantrovich, 2007). When examining the reasons teachers exit the profession before retirement, feelings of isolation leading to career dissatisfaction are big contributors. To meet the growing needs for qualified agriculture teachers, retention of current teachers is vital. The literature states teachers benefit from interaction with other teachers. As a result, teacher collaboration holds promise as a way to help alleviate high teacher turnover. "Collaboration among teachers has been identified as one of the most important features of a school culture that fosters professional development, teacher satisfaction, teacher effectiveness, and student achievement within a school" (Puchner & Taylor, 2006, p. 924).

The teachers in this study mentioned during the first few years of their careers, they were trying to learn everything. Their collaborations often focused on trying to develop lesson plans, managing the FFA and SAEs, and increasing their knowledge of the content area (Greiman et al., 2005). After some time, the teachers could complete their career-related responsibilities with little effort. It was at this point, the teachers went in search of new challenges, often beyond their individual programs. Each one accepted leadership positions with the state agriculture teacher's association, as well as other opportunities for service to the profession. While initially a way to seek fresh challenges, these new frontiers helped the teachers continue to enjoy the career and be fulfilled by it. It also expanded their awareness of the profession.

Participants recognized teacher collaboration as having a positive impact on their career satisfaction (Johnson & Birkeland, 2003). Many factors contribute to a teacher's low career satisfaction, among them, teacher isolation (Greiman et al., 2005; Smith & Ingersoll, 2004). Each teacher expressed they were less than satisfied with their careers prior to collaborating with others. They confessed they often entertained the idea of leaving teaching when they worked independently for long stretches, and were confident they would have continued those thoughts had they remained isolated.

Similar to the experiences of the *leavers* described in the work of Johnson and Birkeland (2003), teachers in this study had rocky starts when they accepted their first teaching positions. They admitted having experienced feelings of overwhelming frustration. However, their determination, commitment to their career choice, and opportunities to collaborate with other teachers in a variety of ways helped see them through those difficult periods (Gehrke & McCoy, 2007a). A variety of teacher collaboration is used in education, for the purposes of teacher socialization and teacher learning (Puchner & Taylor, 2006; Sumison & Patterson, 2004). In the present study, collaboration strengthened the teachers' resolve to grow and improve.

Johnson and Birkeland's (2003) study found teachers who left within the first few years on the job did so because of the professional frustration they felt. For one teacher in the present study, the sheer monotony of the job presented her with feelings of hopelessness and doubts about her professional commitment. The lack of challenge teaching presented after a while was enough to cause her to wonder if she was going to leave the classroom or become the type of teacher who stayed yet was completely disengaged. Instead, she chose the challenge of working with other teachers. As a result, she gave those collaborative activities credit for keeping her in teaching and moving her career onward and upward (Cochran-Smith, 2004).

Each teacher in the study believed in the importance of contributing to the profession beyond classroom teaching. In some cases, the teachers even believed in contributing beyond the agricultural education community. Although this belief was prompted by different reasons, each felt they had something to offer in a way that would satisfy the professional needs of other teachers and themselves. The choices they made also demonstrated their commitment to the future of the profession, a commitment often resulting in increased program visibility.

Implications for further research include engaging in a deeper examination of the teachers' first collaborative experiences. Such research would be of particular interest to teacher educators and those who prepare and facilitate teacher induction programs. In the present study, each participant had positive early experiences with teacher collaboration. This gave the teachers the confidence to seek additional collaborative opportunities. Learning more about the circumstances surrounding initial experiences with collaboration may assist support providers in issuing opportunities for teachers to work with others much sooner. It may also help them discover how to create the ideal collaborative environment. Findings may also uncover ways to help teachers enjoy greater satisfaction and successful outcomes related to teacher collaboration.

Teacher retention is an issue of national concern (Cochran-Smith, 2004; Ingersoll, 2001b; Kantrovich, 2007; Osborne, n.d.). With teachers leaving so soon after their arrival, they find it difficult to gain the skills necessary for success. According to Worthy (2005),

> Teachers who stay in teaching improve dramatically during their first few years. However, largely because of low job satisfaction, too many leave before this point. Thus, 'it is critical to retain new teachers for at least five or six years so they can reach their full potential' (p. 381).

The current study focused on the perceptions and experiences current, mid-career teachers had with teacher collaboration. A future study examining the collaborative practice of those who have left the profession would also expand what is known about the phenomenon. Finding out whether or not this group utilized teacher collaboration in their careers would provide valuable insight into the issue of teacher career satisfaction and retention.

Hargreaves (1994) stated although teachers are apart from other adults throughout the day, their practice is tightly connected with them. This means teacher collaboration has the potential to positively impact not only a teacher's performance but their professional commitment as well (Johnson & Birkeland, 2003). For many teachers, the preservice program is their first experience with the concept of teacher collaboration. It is recommended teacher educators work hard to create an environment in their teacher education programs which fosters teacher reflection. Espoused platforms are integral to gaining a sense of what each pre-professional believes about teaching and learning. They must be developed early in their programs and referenced often, encouraging preservice teachers to consider how their new learning either supports their beliefs or refutes them. With time, these private inquiries may be moved into a small-group or whole-class discussion. This process allows teacher educators to foster trust among preservice teachers as they learn to actively question together. This advances their reflective practice and the potential for socially constructed knowledge about agricultural education, teaching, and learning. The use of social media may also help to further advance these discussions and even foster the development of collaborative structures prior to leaving the university for student teaching and employment.

State agricultural education staff and leaders of professional associations can continue to support the development of a reflective environment by inviting professional dialogue on the topic of teacher collaboration. Since these groups have the potential to play an important role in planning statewide agriculture teacher professional development, they are in a prime position to shape program delivery. They can request every presenter show a connection between his or her presentation and the practice of teacher collaboration. By integrating discussion on the topic during their workshops, agriculture teachers will spend considerably more time thinking about the act of collaboration and getting used to its presence in the profession. The teachers should also be led through exercises to encourage teachers to consider how teacher collaboration can work for them and their colleagues. Guided activities like needs assessments and reflective prompts, followed by down time to let teachers visit about their responses, may create the chance for teachers to discover opportunities for meaningful collaboration. The use of such recommendations may also help to ease the profession's competitive culture so widespread collaboration might thrive.

Loneliness is often dangerous to the commitment and persistence of early career teachers. To launch a united front against this problem, it is further recommended state staff, teacher education and the professional agriculture teachers' association ensure opportunities are available for teachers to socialize. There must be time built into formal event schedules for professional discussion and interaction. Informal opportunities for teachers to talk can encourage the development of connections leading to spontaneous collaboration in the future. Each of the participants mentioned they encountered opportunities for collaborating with other teachers because of discussion they had with other teachers. Simply providing snacks and a lounge space for teachers while their students compete in various events may encourage them to gather and visit on professional matters. Teachers need to make their needs and desires known to one another.

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A Comparison of the Inservice Needs of Traditionally and Alternatively Certified Beginning Teachers in Louisiana

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Abstract

Recently there has been an influx of alternatively certified agriculture education teachers entering the profession. Regardless of certification method agriculture education teachers desire and need inservice training. However, are the needs of traditionally and alternatively certified beginning agriculture teachers similar? Little research exists that documents the inservice needs of alternatively certified teachers, much less alternatively certified beginning teachers. The purpose of this study was to determine the inservice needs of traditionally and alternatively certified beginning agriculture teachers and to what extent did differences exist in the inservice needs between those groups. Based upon the findings of this study both groups indicated little need for inservice education. However, alternatively certified beginning teachers did indicate greater need for inservice education in the program planning and management, professional development, and instruction and curriculum constructs.

Introduction/Theoretical Framework

Effective teachers are developed, not born. Unfortunately, state departments of education appear to think the opposite. This has been evident with the alternative certification methods that several states now employ to enable mid-career adults to enter teaching. It has been apparent that states are emphasizing content knowledge over pedagogical knowledge by allowing individuals who lack any pre-service training into the classroom.

However, the states that are allowing alternatively certified teachers to enter the field are not doing so simply for “the fun of it”. There may not be any other choice. Camp, Broyles, & Skelton (2002) indicated that there has been a shortage of university-prepared agriculture teachers for over 40 years. As a result, school administrators have been left little choice but to fill vacancies with uncertified or alternatively certified teachers. Therefore, with this influx of ill-prepared agriculture teachers it becomes vitally important to provide these teachers with on-the job training in an attempt to provide them the skills to be successful.

Agricultural education is not a static profession. Discoveries, inventions, and technological advancements are made daily that impact the lives of agricultural education teachers. Not only do these discoveries affect how these teachers teach, but what they teach, as well. Due to the ever-changing world of agricultural education the National Research Agenda (2007) called for an assessment of the professional development needs of current agricultural educators. As a result, inservice programs are employed to meet agriculture teachers’ needs to ensure their skills are current (Barrick, Ladewig, & Hedges, 1983). Inservice programs administrators are often left with the responsibility to determine what appropriate topics to include (Barrick, et al.). Roberts & Dyer (2004) indicated that this problem may be a result of the different experiences that alternatively and uncertified teachers possess when compared to traditionally certified teachers. It could be assumed that these two groups do not have the same inservice needs (Roberts & Dyer). Due to the potential differences, needs assessments have been conducted to determine appropriate topics to be included in inservice programs

(Andreasen, Seevers, Dormody, & VanLeeuwen, 2007; Birkenholz & Harbstreit, 1987; Claycomb & Petty, 1983; Duncan, Ricketts, Peake, & Uesseler, 2006; Edwards & Briers, 1999; Garton & Chung, 1996; Harris, 2008; Joerger, 2002; Layfield & Dobbins, 2002; Washburn, King, Garton, & Harbstreit, 2001). Determining the needs for beginning teachers is also vital in preparing inservice and induction programs. Previous researchers have indicated that beginning teachers have different needs than experience teachers. Claycomb & Petty (1983) concluded that the needs of teachers change as they become more experienced. Several researchers have indicated the needs specific to beginning teachers. A summary of these findings are found in Table 1.

Table 1: *Summary of Incervice Needs of Beginning Teachers*

Inservice Need	Researcher(s)
advisory committees	Garton & Chung, 1996 Joerger, 2002 Layfield & Dobbins, 2002
student motivation and leadership	Edwards & Briers, 1999 Washburn & Dyer, 2006
FFA award and proficiency applications	Garton & Chung, 1996 Joerger, 2002
classroom management	Joerger, 2002 Washburn & Dyer, 2006
program planning, marketing, & public relations	Garton & Chung, 1996 Edwards & Briers, 1999 Joerger, 2002 Torres, Ulmer, & Aschenbrener, 2008
CDE preparation	Birkenholz & Harbstreit, 1987 Layfield & Dobbins, 2002 Washburn & Dyer, 2006
SAE programs	Birkenholz & Harbstreit, 1987 Garton & Chung, 1996 Washburn & Dyer, 2006
technology integration	Birkenholz & Harbstreit, 1987 Garton & Chung, 1996 Edwards & Briers, 1999 Joerger, 2002
completing reports and paperwork	Garton & Chung, 1996 Washburn & Dyer, 2006
fundraising	Layfield & Dobbins, 2002 Washburn & Dyer, 2006
establishing support groups/partnerships	Joerger, 2002 Torres, Ulmer, & Aschenbrener, 2008
conducting and managing FFA activities/program	Garton & Chung, 1996 Edwards & Briers, 1999

Research from other education disciplines indicates that differences exist in the inservice needs of traditionally and alternatively certified teachers (Truell, 1999; Wayman, Foster, & Mantle-Bromley 2003). However, little is known about the inservice needs of alternatively certified agriculture teachers, even more so about alternatively certified beginning teachers. Roberts and Dyer (2004) reported that alternatively certified teachers in Florida indicated their greatest inservice needs were preparing proficiency award applications, preparing for career development events, changing the curriculum to meet changes in technology, advances in biotechnology, writing grant proposals for external funding, building the image of agriculture programs and courses, recruiting and retaining quality students, managing and reducing work-related stress, and time management tips and techniques. Roberts & Dyer indicated that knowledge of these differences in teacher needs could assist program administrators in providing the necessary inservice for both groups of teachers. Their question "Do these results hold true in other states?"(p. 69) was seen as a call to action to replicate the study in Louisiana.

Purpose/Objectives

Using the study conducted by Roberts & Dyer as a model, the central purpose of this study was to compare the inservice needs of traditionally and alternatively certified beginning agriculture teachers. To achieve this purpose, this study had three objectives:

1. To describe the self-perceived inservice needs of traditionally certified beginning agriculture teachers.
2. To describe the self-perceived inservice needs of alternatively certified beginning agriculture teachers.
3. To compare group differences in inservice needs between traditionally and alternatively certified agriculture teachers.

Procedures

The instrument used in this study was adapted from the study conducted by Roberts and Dyer (2004). The instrument was altered only by replacing educational terms relevant to Florida with the equivalent terms used in Louisiana. A panel of experts reviewed the survey after the verbiage changes to assess content and face validity. The instrument contained 80 items and was divided into the following constructs: Program Management and Planning, Teacher Professional Development, FFA and SAE Supervision, Instruction and Curriculum and Technical Agriculture. Respondents were asked to rate their need for inservice education for each item using a 5-point Likert-type scale. The scale ranged from not needed (1) to a very strong need (5). Roberts and Dyer had previously submitted the instrument for face and content validity by an expert panel, and estimated reliability using Cronbach's alpha. Construct reliability values were .95, .91, .88, .95, and .91 respectfully for the instrument (Roberts & Dyer). Data were analyzed using SPSS 18.0. Means and standard deviations were determined accordingly.

State agricultural education program specialists provided the researchers with a complete list of agriculture teachers who had completed less than three years of teaching agriculture within the state ($N = 41$). The instrument was mailed to these agriculture teachers during the first week of October, 2008 and late respondents were sent a reminder once a week for three weeks. A total of 29 agriculture teachers agreed to participate and completed the instrument, providing a 71%

response rate.

For the purposes of this study, and similar to Roberts & Dyer (2004), a traditionally certified teacher was defined a teacher who qualified for certification by earning an undergraduate agricultural education degree. Alternatively certified teachers were defined as those who earned their certification by other means and applied directly to the state department of education for certification.

Findings

Demographics

Of the 29 respondents with usable data it was found that slightly more than one-third (*n*=10) were traditionally certified in agricultural education. Of the remaining respondents, 10 majored in an agricultural field, two majored in science, and seven majored in an unrelated field. Twenty-two (76%) had completed a bachelor's degree, six (20%) had earned a master's degree, and one (4%) had earned a Ph.D. Three (10%) respondents strictly taught at the middle school level, 23 (79%) taught at the secondary level, two (7%) taught at both levels and one (4%) did not indicate a level. Finally, a majority of the respondents (67%) were male.

Program Planning & Management

The grand mean for traditionally certified teachers in this construct was 2.43, SD = 1.04. Exactly one-half of the traditionally certified teachers indicated a high need for inservice in writing grant proposals for external funding (50%). These teachers indicated very little inservice needs in the utilizing a local advisory committee, conducting needs assessments, developing business/community relations, establishing a public relations program, building the image of agriculture programs and courses, building collaborative relationships, and working with local media. Alternatively certified teachers had a grand mean of 2.72, SD = 1.05 for this construct. The majority of alternatively certified teachers indicated a high need for inservice in writing grant proposals for external funding (63%). These findings are similar to Roberts & Dyer (2004). However, it is interesting to note that there were no additional needs indicated as topics for inservice by a majority of the respondents. Furthermore, even though a comparison of grand means reveals a slight difference (M = 2.43 and 2.72), negligible differences were found between the inservice needs of traditionally and alternatively certified teachers in this construct. A summary of this data is presented in Table 2.

Teacher Professional Development

The grand mean for traditionally certified teachers in this construct was 2.23, SD = .932 (see Table 3). As found in the table few teachers indicated a need for inservice instruction in any of the topic areas. Two teachers actually indicated that instruction in managing and reducing work-related stress and time management tips and techniques would even be beneficial. The grand mean for alternatively certified teachers was 2.48, SD = 1.06. Although more teachers specified needs for inservice, no topic area received more than a third of the respondents indicating a high need.

When comparing traditionally and alternatively certified teachers a slight difference was found (M = 2.43 and 2.72) between the grand means in the Teacher Professional Development construct. Similar to the findings from the Program Planning and Management construct, the respondents indicated few inservice needs. This is in stark contrast to the findings of Roberts & Dyer (2004) who found that over half of the respondents indicated inservice needs in managing and reducing work-related stress, time management and techniques, and professional growth and development.

Table 2 :*Teachers with High Needs in Program Management and Planning by Certification Method*

	Traditional (n = 10)		Alternative (n = 19)	
	M = 2.43 (1.04)		M = 2.72 (1.05)	
Item	f	%	f	%
Writing grant proposals for external funding	5	50	12	63
Developing an adult program	4	40	4	21
Recruiting and retaining quality students	3	30	5	26
Managing learning labs	3	30	4	21
Evaluating the local agriculture program	3	30	3	16
Fundraising	2	20	6	31
Completing reports for local and state administrators	2	20	5	26
Planning and maintaining a school land lab	2	20	3	16
Utilizing a local advisory committee	1	10	6	31
Conducting needs assessments	1	10	4	21
Developing business/community relations	1	10	4	21
Establishing a public relations program	1	10	4	21
Building the image of agriculture programs and courses	1	10	3	16
Building collaborative relationships	1	10	3	16
Establishing a working relationship with local media	1	10	2	11

Note. Standard deviation in parenthesis next to mean value. Scale: 1 = No Need, 2 = Some, 3 = Moderate, 4 = Strong 5 = Very Strong. Frequency determined by number of new agriscience teachers indicating "very strong" inservice needs.

Table 3: *Teacher Professional Development Needs by Certification Method*

	Traditional (n = 10)		Alternative (n = 19)	
	M = 2.23 (0.93)		M = 2.48 (1.06)	
Item	f	%	f	%
Time management tips & techniques	1	10	6	31
Managing and reducing work-related stress	1	10	1	5
Professional growth and development	0	0	2	11
Becoming a member of the total community	0	0	1	5

Note. Standard deviation in parenthesis next to mean value. Scale: 1 = No Need, 2 = Some, 3 = Moderate, 4 = Strong 5 = Very Strong. Frequency determined by number of new agriscience teachers indicating "very strong" inservice needs.

FFA and SAE Supervision

The grand mean for traditionally certified teachers was 3.26, SD = 1.16 (see Table 4). As indicated by the percentage of teachers with a high need, the greatest needs for inservice education were for preparing proficiency award applications (70%), preparing FFA degree applications (60%), and organizing and maintaining an alumni association (50%). The grand mean for alternatively certified teachers was 3.23, *SD* = 1.21. The inservice needs rated highest were preparing proficiency award applications (63%), preparing FFA degree applications (63%), and preparing POA and national chapter applications.

When comparing traditionally and alternatively certified agriculture teachers a negligible difference (*M* = 3.26 and 3.23) was found between the grand means of the FFA and SAE supervision construct. However, traditionally certified teachers expressed higher levels of inservice need (50% to 26%) in the area of organizing and maintaining an alumni association as compared to their alternatively certified counterparts. Furthermore, alternatively certified teachers indicated a much higher need (58% to 40%) for inservice training to prepare POA and national chapter applications. These findings are not all-together surprising. It would be assumed that traditionally certified teachers would have had more opportunities to gain experience in these areas during pre-service teaching programs.

Table 4: *Teachers with High Needs in FFA and SAE Supervisions by Certification Method*

	Traditional (*n* = 10)		Alternative (*n* = 19)	
	M = 3.26 (1.16)		*M* = 3.23 (1.21)	
Item	*f*	%	*f*	%
Preparing proficiency award applications	7	70	12	63
Preparing FFA degree applications	6	6	12	63
Organizing and maintaining an alumni association	5	50	5	26
Preparing POA & National Chapter Applications	4	4	11	58
Developing SAE opportunities for students	4	40	8	42
Supervising SAE programs	4	40	7	37
Preparing for Career Development Events	4	40	6	32
Supervising CO-OP/Internships	2	20	5	26
Supervising show animal SAE projects	1	10	4	21

Note. Standard deviation in parenthesis next to mean value. Scale: 1 = No Need, 2 = Some, 3 = Moderate, 4 = Strong 5 = Very Strong. Frequency determined by number of new agriscience teachers indicating "very strong" inservice needs.

Instruction and Curriculum

The grand mean for traditionally certified teachers for this construct was 2.32, *SD* = 1.01 (see Table 5). Similar to the findings in the Professional Development construct, a majority of traditionally certified teachers did not indicate a high need for inservice training in this area. Specifically, these teachers indicated no need for inservice in integrating math into agriculture instruction, understanding learning styles, teaching leadership, developing a magnet program or academy, or integrating science into agriculture instruction. On the other hand, the alternatively certified teachers did indicate a high inservice need in this area. Ten (53%) indicated a high need for inservice training to develop teaching techniques and ideas to motivate students. Like their traditionally certified counterparts, these teachers also indicated that assistance was not needed in integrating science into the curriculum.

Similar to the previously noted data, slight differences existed in the grand mean scores between the two groups of teachers (*M* = 2.32 and 2.36). Alternatively certified teachers requested more inservice training (42%) in testing and assessing student performance than their traditionally certified counterparts (10%). A noticeable difference was also found surrounding the motivating students topic area. One (10%) of the traditionally certified teachers indicated a high need for training, where as 58% of alternatively certified teachers indicated a high need.

Table 5 : *Teachers with High Needs in Instruction and Curriculum by Certification Model*

	Traditional (n = 10)		Alternative (n = 19)	
	M = 2.32 (1.01)		M = 2.36 (1.11)	
Item	*f*	%	*f*	%
Teaching SAE in the classroom	4	40	5	26
Changing the curriculum to meet changes in technology	3	30	2	11
Designing programs for non-traditional & urban students	2	20	3	16
Planning and effective use of block scheduling	2	20	2	11
Motivating students – teaching techniques and ideas	1	10	10	53
Testing and assessing student performance	1	10	8	42
Managing student behavior	1	10	5	26
Modifying lessons for special needs and ESL students	1	10	4	21
Modifying curriculum and courses to attract high quality students	1	10	3	16
Teaching in laboratory settings	1	10	3	16
Developing critical thinking skills in your students	1	10	2	11
Integrating state standards into the curriculum	1	10	2	11
Teaching problem-solving and decision making skills	1	10	2	11
Using computer technology and computer applications	1	10	1	5
Integrating math into agriculture instruction	0	0	4	21
Understanding learning styles	0	0	3	16
Teaching leadership	0	0	2	11
Developing a magnet program or academy	0	0	1	5
Integrating science into agriculture instruction	0	0	0	0

Note. Standard deviation in parenthesis next to mean value. Scale: 1 = No Need, 2 = Some, 3 = Moderate, 4 = Strong 5 = Very Strong. Frequency determined by number of new agriscience teachers indicating "very strong" inservice needs.

Technical Agriculture

The grand mean for traditionally certified agriculture teachers for this construct was 2.79, *SD* = 1.12 (see Table 6). The majority of teachers indicated a high level of need for inservice training on electricity and controls (60%), global positioning systems (60%), aquaculture (50%), and small engine technology (50%). The grand mean for the alternatively certified teachers was 2.73, *SD* = 1.21. These respondents did not indicate a high need for inservice in any area. Although interesting, this is not completely dissimilar from what Roberts & Dyer (2004) found in their study. Their research indicated that alternatively certified teachers had a high need for inservice training only in advances in biotechnology.

When comparing the inservice needs of traditionally certified and alternatively certified teachers, similar needs were observed, as specified by the grand means (*M* = 2.79 and 2.73, respectively). Differences were observed in several of the individual items. Traditionally certified teachers indicated more inservice training needs in large (40% versus 11%) and small project construction (40% versus 5%). Alternatively certified teachers indicated more inservice training needs in landscaping (32% versus 20%), forestry (32% versus 10%), greenhouse operation and management (26% versus 0%), and plant propagation (32% versus 0%).

Table 6 : *Teachers with High Needs in Technical Agriculture by Certification Method*

	Traditional (*n* = 10)		Alternative (*n* = 19)	
	M = 2.79 (1.12)		*M* = 2.73 (1.21)	
Item	*f*	%	*f*	%
Electricity and Controls	6	40	8	42
Global Positioning Systems (GPS)	6	60	6	32
Small Engine Technology	5	50	7	37
Aquaculture	5	50	6	32
Genetic Engineering	4	40	6	32
Tissue Culture	4	40	6	32
Meat Science	4	40	5	26
Oxy-Acetylene Welding and Plasma Cutting	4	40	4	21
Ag Mechanics – Large Project Construction	4	40	2	11
Ag Mechanics – Small Project Construction	4	40	1	5
Floriculture	3	30	8	42
Advances in Biotechnology	3	30	5	26
Restricted Pesticide License Training	3	30	4	21
Tool and Machine Conditioning and Repair	3	30	2	11
Animal Reproduction – A.I. and Embryo Transfer	2	20	8	42
Plant Identification and Use	2	20	7	37
Landscaping	2	20	6	32
Waste Management	2	20	5	26
Food Science and Food Safety	2	20	4	21
Soil Science	2	20	3	16
Global Agriculture Issues	2	20	2	11
Forestry	1	10	6	32
Turfgrass	1	10	6	32
Water Quality/Water Regulations	1	10	5	26
Financial Management	1	10	4	21
Forages	1	10	4	21
Animal Health	1	10	3	16
Animal Nutrition	1	10	3	16
Natural Resource Management	1	10	3	16
Record Keeping Skills	1	10	3	16
Agricultural Sales and Marketing	1	10	2	11
Plant Propagation	0	0	6	32
Greenhouse Operation and Management	0	0	5	26

Note. Standard deviation in parenthesis next to mean value. Scale: 1 = No Need, 2 = Some, 3 = Moderate, 4 = Strong 5 = Very Strong. Frequency determined by number of new agriscience teachers indicating "very strong" inservice needs.

Conclusions, Discussion, and Implications

Based upon the research purpose and objectives of this study, several conclusions can be drawn. First, nearly two-thirds of the beginning teachers in this study received their certification by some means other than what is considered the traditional route. This is much larger than what Roberts & Dyer (2004) found in their study. These researchers noted that 49% of agriculture teachers in Florida were alternatively certified. According to Camp et al. (2002) the national average is just over 13%.

The first objective of this study sought to describe the inservice needs of traditionally certified beginning teachers. The findings indicated that that these teachers have the highest level of inservice needs in the FFA and SAE and Technical Agriculture constructs, followed by Program Planning and Management, Instruction and Curriculum, and Professional Development. It is interesting to note, that the order of importance is nearly opposite of the findings of Roberts & Dyer (2004). The greatest individual inservice need for this group was preparing proficiency award applications. Although this was noted as a high need in previous studies, (Garton & Chung, 1996; Roberts & Dyer, 2004; Washburn et al. 2001) it was not identified as the most pressing need.

The second objective was to describe the inservice needs of alternatively certified agriculture teachers. The findings indicated that the greatest inservice needs of this group are in the FFA and SAE Supervision construct followed in decreasing order by Technical Agriculture, Program Planning and Management, Professional Development, and Instruction and Curriculum constructs. Three individual items garnered the same level of importance, writing grant proposals for external funding, preparing proficiency award applications, and preparing FFA degree applications. Roberts & Dyer (2004) also found that inservice training in writing grant proposals was of high importance, the latter are new findings.

The third objective of this study was to compare the differences in inservice needs between the two groups of teachers. Based upon the findings of this study, alternatively certified teachers have greater inservice needs than do traditionally certified teachers in Program Planning and Management, Professional Development, and Instruction and Curriculum. When examining specific items, alternatively certified teachers indicated high inservice needs on only five items. Traditionally certified teachers indicated high needs on eight items. Although Roberts & Dyer (2004) did not specifically target beginning teachers, these conclusions are strikingly different than what they reported.

The results of this study generate nearly as many questions as answers. Do the beginning agriculture teachers in this study simply lack the professional knowledge to identify their deficiencies? Why do the inservice needs of beginning teachers in this study differ so greatly than agriculture teachers in Florida? Are the study participants who are graduates of post-secondary agricultural education programs being prepared in such a fashion that little additional assistance is needed? Are there really any significant differences between traditionally and alternatively certified teachers? Are the differences that exist between the findings of this study and that of Roberts and Dyer (2004) related to geographic location, cultural beliefs and ideals, or some other unidentified phenomenon? It is recommended that these questions be used as a guide for further research.

Although few inservice needs were indicated by the study participants it is still recommended that an induction program for these teachers be developed to assist them with their self-perceived needs. Participating in such a program may assist the beginning teachers in identifying additional needs that they may have been unaware of, as a result of idea sharing between other beginning teachers. Furthermore, utilizing findings and data from similar studies in other states is beneficial when attempting develop needs assessments or inservice programs. The National Research Agenda (2007) noted that professional develop programs must be provided that account for the subtle differences that may exist between teachers based on geographic locale. This supports the recommendation that this study to be completed in other states so that university faculty and state staff can identify and address the needs of agriculture teachers in their own state.

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Professional Development Needs of Missouri Agricultural Educators

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Abstract

The National Research Agenda for Agricultural Education and Communication (Osborne, 2007) states that professional development for agricultural educators is key to improving teacher retention, program continuity, and the preparation of fully qualified and highly motivated agricultural educators. This research investigated the self-assessed, professional development needs of school-based agricultural educators in Missouri using the direct assessment method. Census data were collected with questionnaires administered at area agricultural education teacher meetings and via an electronic questionnaire for those teachers who could not attend those meetings. Results indicated that teachers have the greatest in-service needs in the areas of: laboratory teaching, Missouri agricultural operations, and agricultural mechanics technology. To improve the technical competence of these teachers, Missouri agricultural educators should receive professional development in-service education in these areas. According to literature, Missouri agricultural teacher educators and state agricultural education supervisory staff should develop these professional development in-service education programs and deliver them during technical workshops and summer conferences (Barrick, Ladewig, & Hedges, 1983; *Birkenholz & Harbstreit, 1987*; *Saucier, Schumacher, Funkenbusch, Terry, & Johnson, 2008).*

Introduction and Theoretical Framework

A century ago, school-based agricultural education programs focused on production agriculture with the ultimate goal of preparing students to return to the farm and pursue a career in agriculture (Leake, 1915). Stimson (as cited in Moore, 1988) stated that these programs consisted of classroom lecture, recitation, and manual labor. Over the years, agricultural education programs evolved considerably from production oriented training to consumption based curriculum and courses (Washburn & Dyer, 2006). Agricultural educators of today are faced with the growing challenge of providing a positive learning environment for students and preparing them for productive lives in a fast-paced world (Layfield & Dobbins, 2002). In addition they are encouraged to integrate science, reading, and mathematics curriculum into many of the agricultural education courses that they teach (Washburn & Dyer). The constant evolution of agricultural education programs and the addition of core subject content skills have required many teachers to seek professional development opportunities to meet the demands of the changing emphasis of their programs (Washburn & Dyer).

As the focus of school-based agricultural education programs have evolved, so has the need for professional development opportunities for agricultural educators. Operationally, the purpose of professional development is to provide educators the essential knowledge, skills and technical information required for them to effectively carry out their professional duties and meet the demands of a changing educational environment (Barrick, Ladewig, & Hedges, 1983; Birkenholz & Harbstreit, 1987; Nesbitt & Mundt, 1993; Washburn, King, Garton & Harbstreit, 2001). Historically, professional development has been one of the roles of collegiate agricultural education programs and state agricultural education supervisory staff (Barrick, et al.). The planning and implementation of these professional development opportunities has generally been developed with little input from educators in the field (Washburn, et al.) Traditionally, three predominate methods have been used by agricultural teacher educators and state supervisory staff to determine the in-service needs of agriculture educators: research (Layfield & Dobbins, 2000; Washburn, et al.), personal experiences (Barrick et al.), and informal inquiry with current agricultural educators (Barrick et al.; Roberts & Dyer, 2004).

According to Layfield and Dobbins (2002), a critical factor in developing successful teachers is correctly identifying professional development needs that are in the greatest demand. By understanding the problems faced by agricultural educators, university faculty and state agricultural education supervisory staff can improve professional development programs to address teachers' needs (Mundt & Connors, 1999). Literature suggests that providers of continuing education programs have experienced difficulties in identifying appropriate topics to include in professional development programs (Washburn, et al., 2001). To accomplish this goal, providers of professional development in-service education should monitor the needs of agriculture teachers over time and provide educational programs based upon their current needs (Birkenholz & Harbstreit, 1987). Garton and Chung (1995) concluded that "the in-service needs of agriculture teachers should be assessed and prioritized on a continual basis" (p. 78).

Waters and Haskell (1989) suggested that current educators be included in the process to identify contemporary professional development in-service needs of agriculture teachers. They stated that "gathering data from potential clientele and actively involving them in the process of identifying potential educational programs increases the likelihood of implementing relevant educational programs; thus, increasing the likelihood of achieving appropriate outcomes" (p. 26). Newcomb, McCracken, and Warmbrod (1993) agreed stating "individuals are more motivated to learn when they are actively involved in planning learning activities" (p. 32). In a 2005 study of New York agricultural science educators, researchers found that teachers believed professional development was most meaningful to them when it was personalized to their needs (Park, Moore & Rivera, 2007). When teachers felt engaged, they set their own learning expectations, became interested, and asserted themselves toward changing their teaching practices. By understanding the major problems facing school-based agriculture teachers, teacher educators and state supervisory staff can make improvements in the professional development in-service programs offered to today's teachers (Washburn & Dyer, 2006).

According to Witkin (1984), no one model or conceptual framework for needs assessment has been universally accepted. However, many professional development studies have used the Borich Needs Assessment Model (Borich, 1980) to determine the in-service needs of teachers (Garton & Chung, 1995, Saucier, Terry, & Schumacher, 2009). Consequently, empirical evidence has failed to prove one method to be superior over another. Witkin (1984) further stated that the educational needs of a group could be better evaluated by using a variety of needs assessment models. To guide this study, the researchers utilized Knowles' (1980)

Theory of Andragogy as a theoretical base. This theory states that adults need to know why they need to learn something and become more motivated to learn when they see the need to learn. The theory further states that adults learn experientially, learn as problem solvers, and learn best when the topic is of immediate value to them. Knowles' stated that adults should be engaged in the planning of their own learning experiences. To measure the in-service needs of Missouri agriculture teachers, the researchers utilized the direct assessment method to determine the self-perceived education needs of teachers (Birkenholz & Harbstreit, 1987; Briers & Edwards, 1998). Due to the length of the instrument and the limited amount of contact time that the researchers had with the population, the use of the Borich Needs Assessment Model (1980) was not feasible; thus the researchers chose the direct assessment method which allowed agricultural educators the opportunity to have a role in the identification of future professional development topics.

Ten years have elapsed since the last comprehensive study of professional development in-service needs of Missouri agricultural educators. In previous studies, researchers found that Missouri agricultural educators had in-service needs in the following areas: developing agribusiness management skills, electricity skills, training FFA contest teams, assisting students with SOEP records, completing reports for local and state administrators, motivating students to learn, developing an effective public relations program, preparing proficiency award applications, use of computers, writing grant proposals, attracting quality students, bio-technology applications, and landscaping (Birkenholz & Harbstreit, 1987; Garton & Chung, 1996; King & Garton, 2000). Due to the length of time since those studies were conducted and the continual need for research regarding the professional development in-service needs of agricultural educators (Osborne, 2007), an assessment of current professional development needs of agriculture teachers was warranted.

Purpose and Research Questions

The purpose of this study was to identify the professional development in-service needs of Missouri agricultural educators. The following research questions were investigated to accomplish this purpose:

1. What are the personal and professional characteristics (years of teaching experience, agricultural education district, agricultural education area, sex, FFA membership, 4-H membership, type of teacher certification, major in bachelor's degree, minor in bachelor's degree) of school-based agricultural educators in Missouri?

2. What are the professional development in-service needs of school-based agricultural educators in Missouri related to selected competencies including: curriculum and instruction, technical agriculture teaching topics, student and teacher development, and program management and planning?

Procedures

Population

The population for this study was all school-based agricultural education teachers in Missouri ($N = 467$). Subjects were identified from the 2008-2009 Missouri Agricultural Education Directory (2008) and were confirmed by the agricultural education professional development staff of the Missouri Department of Elementary and Secondary Education (J. Tummons) personal communication, September 1, 2008). Through this process, 467 teachers were identified as members of the population.

Methodology

The data collection instrument developed by Garton and Chung (1995) was modified for use with this study. The instrument contained two sections. The first section was composed of items describing competencies associated with teaching school-based agricultural education. Those competencies were organized into five constructs: curriculum and instruction, preparation of a career development event team, program management and planning, student and teacher development, and technical agriculture teaching topics. Competencies were identified through a review of relevant literature and from input of a panel of experts. The panel of experts was composed of three university faculty members with expertise in agricultural education, four agricultural education graduate students with prior school-based agricultural education teaching experience, a professional development specialist from the agricultural education division of the Missouri Department of Elementary and Secondary Education and a university faculty member with expertise in research methods and data collection instrument design. Response choices for each item were the following five-point, anchored, Likert-type scale: 0 = *no need*, 1 = *little need*, 2 = *some need*, 3 = *much need*, and 4 = *highest need*. The second section of the instrument was designed to collect data related to selected personal and professional demographic characteristics of the respondents. Characteristics investigated were: years of teaching experience, agricultural education district location, agricultural education area location, sex, FFA membership, 4-H membership, type of teacher certification, major in bachelor's degree, and minor in bachelor's degree.

The panel of experts described above was also utilized to determine the face and content validity of the instrument. After implementation of suggestions provided by the panel, the instrument was judged to be valid. A pilot test was conducted to determine the reliability of the instrument. The pilot test group was composed of 20 experienced school-based agricultural education teachers from Missouri who served as mentors in a mentor/inductee program for first and second year agricultural education teachers. Due to their participation in the pilot study, these teachers were excluded from the census. Cronbach's alpha (Cronbach, 1951) was used to measure the reliability of the instrument using data collected from the pilot group. Cronbach's alpha was calculated for each construct in the study yielding the following results: Curriculum and Instruction (.94), Preparation of a Career Development Event Team (.90), Program Management and Planning (.95), Student and Teacher Development (.90), and Technical

Agriculture Teaching Topics (.87). These alpha levels were deemed to be acceptable indicators of instrument reliability (Nunnally & Burnstein, 1994).

After the validity and reliability of the instrument were established, the instrument was administered to the population. A census was conducted of all Missouri agricultural educators, excluding the pilot group. The questionnaire was administered at each of the 16 area agricultural education teacher meetings. This stage of data collection resulted in 310 acceptably completed questionnaires, yielding a 69.35% response rate. A second round of data collection was conducted to gather data from teachers who did not attend one of the area meetings. An online instrument, using the same competencies as the paper instrument, was utilized in the second round of data collection and yielded responses from an additional 16.33% (n = 73) of the population. The response rate resulting from the two stages of data collection was 85.68% (n = 383). Responses from both stages of data collection were only extrapolated to the respondents of the study and not to the overall population of teachers; therefore, no issues of non-response error were addressed for this study.

Data Analysis

Data relative to all research questions were analyzed utilizing SPSS 17.0 or Microsoft Excel®. Descriptive statistics were calculated for all professional development competencies and demographic characteristics. For research question one, the mean, standard deviation, and range were calculated for the demographic characteristic years of teaching experience. Frequency and percentage were calculated for the remaining demographic characteristics. For research question two, means, standard deviations, and overall rank of in-service need were calculated for each professional development competency. The following anchors were used to describe the means for in-service need: *no need* = 0.00 – 0.50; *little need* = 0.51 – 1.50; *some need* = 1.51 – 2.50; *much need* = 2.51 – 3.50; *highest need* = 3.51 – 4.00. Additionally, a grand mean was calculated for each construct using the mean from each competency.

Findings

Findings Associated with Research Question # 1

The average years of teaching experience for Missouri agricultural educators who participated in this study was slightly more than 10 (M = 10.14; SD = 8.29), with a range of experience from 1 year to 38 years. The district with the most respondents was the Central District (n = 85; 22.20%). The district with the fewest respondents, compared to the other five districts, was the Southeast District (n = 35; 9.10%). More respondents were from schools in Area 8 (n = 33; 8.60%) than from any of the other 15 areas. The area with the fewest respondents was Area 12 (n =16; 4.20%). More than 70% (n = 272; 71.01%) of the agricultural educators who participated in this study were male.

A total of 339 (88.50%) Missouri agricultural educators reported that they had been a member of the National FFA Organization. In addition, 222 (58.00%) of the respondents reported that they had been a 4-H member as a youth. Nearly 9 out of 10 (n = 340; 88.80%) of Missouri agricultural educators reported that they had a traditional agriculture teacher certification while only 7.80% (n = 30) hold an alternative agriculture teacher certification. The remaining 30 (3.40%) respondents failed to designate the type of certification that they possess.

Table 1 displays the undergraduate areas of study of Missouri agricultural educators. More than three quarters (n = 293; 76.50%), of the respondents reported that their undergraduate degree major was agricultural education. Additionally, 156 (40.70%) of the respondents reported that they did not have an undergraduate degree minor.

Table 1
Areas of Study for Missouri Secondary Agricultural Educators (n = 383)

Area	*f*	%
Major areas of study		
Agricultural Education	293	76.50
Other	21	5.50
Missing	18	4.70
Animal Science	17	4.40
Agricultural Business	9	2.30
Agronomy	8	2.10
Animal Nutrition	6	1.60
Agricultural Economics	4	1.00
Agricultural Systems Management	4	1.00
Horticulture	3	0.80
Minor areas of study		
None	156	40.70
Missing	62	16.20
Agricultural Economics	44	11.50
Animal Science	25	6.50
Other	22	5.70
Agricultural Business	18	4.70
Agricultural Education	18	4.70
Agronomy	11	2.90
Plant Science	10	2.60
Animal Nutrition	7	1.80
Agricultural Systems Management	4	1.00
Horticulture	4	1.00
Forestry	1	0.30
Turfgrass Management	1	0.30

Findings Associated with Research Question # 2

Alkin (1974) stated that "curriculum consists of the intended learning outcome; the results or the ends of an instructional activity" (p. 43). He described instruction as "the planning and implementation of appropriate strategies for curricular components" (p. 44). The researchers utilized Alkin's definition of curriculum and instruction to describe the construct "Curriculum and Instruction" investigated in this study. The grand mean for this construct was 2.26, indicating that teachers perceived some need for professional development in-service for this group of competencies. The most highly ranked competency in this construct was "Laboratory teaching practices" (*M* = 2.58). In fact, that competency ranked highest among the 66 competencies investigated. As shown in Table 2, teachers indicated some need for in-service education for the remaining 10 items in this construct that included topics such as: "Motivating student learning" (*M* = 2.40), "Integrating science into the agriculture curriculum" (*M* = 2.31), "Teaching student personal finance" (*M* = 2.17), and "Teaching decision-making skills" (*M* = 2.07). The competency with the least need for in-service education in this construct was the competency "Managing student behavior" with a mean of 1.80.

Table 2
Teachers' Self-Perceived Need for In-Service for Competencies Associated with Curriculum and Instruction (*n* = 383)

Competency	*M*	*SD*	Overall Rank
Laboratory teaching practices	2.58	0.84	1
Designing curriculum to attract students	2.48	0.91	6
Motivating student learning	2.40	0.96	10
Online teaching resources	2.39	0.96	12
Integrating science into the agriculture curriculum	2.31	1.00	17
Management of instructional facilities (e.g. agricultural mechanics, horticulture)	2.28	0.94	21
Designing courses for alternative credit	2.27	1.09	22
Teaching student personal finance	2.17	0.96	35
Classroom teaching practices	2.15	0.77	36
Teaching decision-making skills	2.07	0.83	46
Managing student behavior	1.80	0.97	60
Grand mean	2.26		

Note. Scale: no need: 0.00 – 0.50; little need = 0.51 – 1.50; some need = 1.51 – 2.50; much need = 2.51 – 3.50; highest need = 3.51 – 4.00.

The construct "Student and Teacher Development" was operationally defined as skills and techniques used and acquired by agricultural educators to accomplish the daily tasks of their position. The grand mean for the construct Student and Teacher Development was 2.21, indicating that teachers perceived some need for professional development in this construct. As shown in Table 3, the competency "Tours of Missouri agriculture" was ranked as the highest in-service education need (*M* = 2.54) among 11 items included in this construct and was the only item for which teachers indicated much need for in-service education. Of the remaining 10 competencies, respondents rated them as having some need for in-service education. Examples of other competencies included in this construct were: "Developing SAE opportunities" (*M* = 2.43), "Conducting successful FFA chapter activities" (*M* = 2.28), and "Managing work related stress" (*M* = 2.20). With each having a mean of 1.92, the competencies "Food for America programs" and "Supervising traditional SAE programs" tied as the lowest ranked competencies for in-service education in this construct (*M* = 1.92).

Table 3
Teachers' Self-Perceived Need for In-Service for Competencies Associated with Student and Teacher Development (*n* = 383)

Competency	*M*	*SD*	Overall Rank
Tours of Missouri agriculture	2.54	1.11	2
Tours of American agriculture (other than Missouri)	2.44	1.14	8
Developing SAE opportunities for students	2.43	0.95	9
Conducting successful FFA chapter activities	2.28	1.01	21
Preparing FFA awards/ degree applications	2.24	1.04	28
Supervising non-traditional SAE programs	2.24	1.04	28
Managing work related stress	2.20	1.09	33
Time management (tips and techniques)	2.10	1.03	43
Organizing a FFA Alumni association	2.00	1.10	49
Food for America programs	1.92	0.99	55
Supervising traditional SAE programs	1.92	1.00	55
Grand mean	2.21		

Note. Scale: no need: 0.00 – 0.50; little need = 0.51 – 1.50; some need = 1.51 – 2.50; much need = 2.51 – 3.50; highest need = 3.51 – 4.00.

The construct category "Program Management and Planning" was operationally defined as skills needed by Missouri agricultural educators to plan, manage, maintain, and improve the local agricultural education/FFA program. The grand mean for this construct was 1.89, indicating teachers perceived some need for professional development education. In this construct, the competency "Writing grant proposals for external funding" was the highest ranked in-service education need (*M* = 2.47). Overall, respondents rated 14 out of 16 competencies as having some need for in-service education. These competencies included such topics as: "Improving the image of your agriculture program" (*M* = 2.33), "Completing reports for administrators" (*M* = 1.89), and "Establishing an adult agriculture education program" (*M* = 1.79). The competency with the least need for in-service education in this construct was "Effective use of block scheduling" (*M* = 1.23). Table 4 displays the data related to these findings.

Table 4

Teachers' Self-Perceived Need for In-Service for Competencies Associated with Program Management and Planning (n = 383)

Competency	*M*	*SD*	Overall Rank
Writing grant proposals for external funding	2.47	1.16	7
Improving the image of your agriculture program	2.33	1.01	14
Creating a FFA chapter website	2.32	1.17	15
Utilizing a local advisory committee	2.09	1.10	44
Developing business/community relations	1.99	0.99	50
Using online FFA resources	1.99	1.04	50
Evaluating the local agriculture education program	1.95	0.94	53
Establishing a working relationship with local media	1.95	1.02	53
Completing reports for administrators	1.89	1.02	58
Middle school classes	1.81	1.09	59
Establishing an adult agriculture education program	1.79	1.15	61
Maintaining a school land lab	1.70	1.26	62
Organizing a local FBMA (Farm Business Management Analysis) program	1.51	1.10	63
Recruiting for Young Farmers/Young Farm Wives	1.42	1.22	64
Effective use of block scheduling	1.23	1.23	65
Grand mean	1.89		

Note. Scale: no need: 0.00 – 0.50; little need = 0.51 – 1.50; some need = 1.51 – 2.50; much need = 2.51 – 3.50; highest need = 3.51 – 4.00.

The construct "Technical Agriculture Teaching Topics" was operationally defined as technical agricultural subject matter that is taught by teachers in Missouri agricultural education classes. As shown in Table 5, the grand mean for this construct was 2.22, meaning teachers perceived some need for in-service education in this area. "Global Positioning Systems (GPS)" ranked as the highest in-service education need in the construct (M = 2.54). Teachers rated 3 of the 26 items in this group to be topics in which they have much need for professional development. All other items, which included such varied topics as: "Agricultural structures" (M = 2.40), "Genetic engineering" (M = 2.29), "Show animals" (M = 2.11), and "Floral design" (M = 2.02), were rated as topics that teachers need some in-service education. The competency "Companion animal care" ranked as the lowest in-service education need in this construct (M = 1.91).

Table 5
Teachers' Self-Perceived Need for In-Service for Competencies Associated with Technical Agriculture Teaching Topics (*n* = 383)

Competency	*M*	*SD*	Overall Rank
Global Positioning Systems (GPS)	2.54	1.04	2
Bio-Fuels	2.53	1.01	4
Biotechnology	2.51	0.99	5
Agricultural structures	2.40	1.09	10
Agricultural mechanics project construction	2.36	1.09	13
Animal reproduction	2.32	1.00	15
Veterinarian assistant training	2.30	1.13	18
Leadership development	2.29	1.00	19
Genetic Engineering	2.29	1.05	19
Natural resource management	2.27	0.99	22
Landscaping	2.27	1.00	22
Renewable energy sources	2.27	1.07	22
Food science	2.25	1.07	27
Greenhouse management	2.24	1.06	28
Electricity	2.23	1.04	31
Small engine technology	2.22	1.11	32
Alternative animal production	2.19	1.01	34
Tractor restoration	2.15	1.24	36
Agricultural communications	2.14	0.92	38
Record keeping skills	2.14	1.02	38
Animal nutrition	2.13	0.89	40
Show animals	2.11	1.09	41
Hot metal work	2.11	1.13	41
Cold metal work	2.09	1.14	44
Floral design	2.02	1.07	47
Plumbing	2.01	1.07	48
Tissue culture	1.99	1.15	50
Companion animal care	1.91	1.09	57
Grand mean	2.22		

Note. Scale: no need: 0.00 – 0.50; little need = 0.51 – 1.50; some need = 1.51 – 2.50; much need = 2.51 – 3.50; highest need = 3.51 – 4.00.

Conclusions, Implications, and Recommendations

Research Question # 1

The typical school-based agricultural educator in Missouri is a male with 10 years of teaching experience. He teaches at a school located in the Central agricultural education district and the Area 8 agricultural education area. As a youth, he was a member of the National FFA

Organization and 4-H. In addition, he holds a traditional teacher certification in agriculture and a bachelor's degree in agricultural education. The characteristics of the respondents along with factors such as: location, length of time, time of year, cost, graduate school credit, and use of distance education technology (synchronous and asynchronous) should be considered in developing professional development programs for agriculture teachers.

Research Question # 2

Missouri agricultural educators have the greatest professional development in-service needs in the construct areas of Curriculum and Instruction, Technical Agriculture Teaching Topics, and Student and Teacher Development. Current trends and emerging opportunities related to these general areas should be the focus of in-service education programs for teachers in this state. The five specific topics in which teachers have the greatest need for continuing education are: (a) laboratory teaching practices, (b) Global Positioning Systems (GPS), (c) touring Missouri agricultural operations, (d) bio-fuels, and (e) bio-technology.

According to Osborne (2007) A research based professional development program will result in "an abundance of fully qualified and highly motivated agricultural educators at all levels" (p. 20). Based upon the conclusions of this research, several implications must be considered:

1. Interestingly, three of the top five professional development needs identified in this study relate to school-based agricultural mechanics curriculum. Why do teachers feel such a need for professional development related to agricultural mechanics? Has this field of the agricultural education curriculum moved to areas in which teachers have no previous experience? Is the current curriculum different from what middle and late career teachers learned during their pre-service education? Do Missouri pre-service programs adequately instruct beginning teachers in the area of agricultural mechanics? Have too few in-service programs related to agricultural mechanics been offered in recent years for existing teachers? Do teachers in other areas of the U.S. have these same professional development needs? Many of these questions and others should be asked of pre-service and in-service agricultural education programs around the U.S.

2. Literature suggests that the primary responsibility of the agriculture teacher is to provide safety instruction and a safe learning environment for students working in an agricultural education laboratory (McMahon, 1975; Saucier et al., 2008; Saucier et al., 2009; Strong, 1975). However, several studies, including this one, found that voids exist in the area of laboratory safety (Forsythe, 1983; Jarrett, 1967; Rosencrans, 1996, Saucier et al., 2008, Saucier et al., 2009). If teaching in a laboratory is one of the fundamental instructional methods used in all aspects of school-based agricultural education (animal science, horticulture, agricultural mechanics, food science, etc.), what efforts are being made by teacher education programs to better prepare future teachers for this critical task? Do teachers from other areas of the U.S. have these same professional development needs? What professional development education opportunities are currently offered for existing

teachers in other areas of the U.S., who need in-service education in laboratory teaching and management?

3. Teacher educators have identified agricultural mechanics as a vital part of secondary agricultural programs (Burris, Robinson, & Terry, 2005). Research also supports the point that many agriculture teachers, at all career levels, are in need of continuing professional development in the curriculum area of agricultural mechanics (Fletcher & Miller, 1995; Saucier et al., 2008; Saucier et al., 2009; Swan, 1992). Acknowledging the aforementioned research and the results of this study, what agricultural mechanics courses are required of pre-service teachers within U.S. agricultural teacher education programs? Are these pre-service teachers instructed by agricultural education faculty or are these academic responsibilities bestowed to faculty members in other departments? Are pre-service teachers adequately prepared to instruct school-based agricultural education courses?

4. In the past, so called "travel courses," where offered as graduate courses from Missouri universities. For a variety of reasons, such opportunities no longer exist. Is there sufficient teacher interest in this type of professional development program? If a "travel course" involved tours, would participants be willing to pay the extra fees required to make them possible? Could the interests and needs associated with such programs be met through virtual tours, such as videos made available online?

According the *National Research Agenda for Agricultural Education and Communication*, "well designed professional development experiences, based upon teacher career stage, may improve teacher retention and program continuity" (Osborne, 2007, p. 20). Additionally, literature suggests that "practicing teachers must have continuing access to high quality professional development programs" (2007, p. 20). Acknowledging the work of Osborne and others (Barrick et al., 1983; Birkenholz & Harbstreit, 1987; Saucier et al., 2008; Saucier et al., 2009), it is recommended that studies similar to this one be conducted periodically to ensure the continuing education needs of teachers are met. Recognizing that knowledge and technology related to agriculture constantly evolve and the average years of experience of Missouri agriculture teachers is only 10 years, the researchers recommend that a comprehensive assessment of professional development needs be conducted in each state, every five years.

Furthermore, literature suggests that one of the primary responsibilities of an agriculture teacher is to provide a safe learning environment for students working in an agricultural education laboratory (McMahon, 1975; Saucier et al., 2008; Saucier et al., 2009; Strong, 1975). However, due to the lack of recent empirical research concerning agricultural education laboratory safety and the constant need for teacher professional development in this area, the authors suggest that research be conducted to determine the educational needs of teachers concerning laboratory management and safety.

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Laboratory Management In-Service Needs of Wyoming Secondary Agriculture Teachers

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Abstract

Accidents happen; however, the likelihood of accidents occurring in the agricultural mechanics laboratory is greatly reduced when agricultural mechanics laboratory facilities are managed by secondary agriculture teachers who are competent and knowledgeable. This study investigated the agricultural mechanics laboratory management in-service needs of Wyoming secondary agriculture teachers who are responsible for managing agricultural mechanics laboratories. Data were collected with a Web-based questionnaire designed to determine the teachers' perceptions of the importance of 70 selected agricultural mechanics laboratory management competencies and their self-assessed ability to perform those competencies. The Borich (1980) Needs Assessment Model was used to assess and evaluate the in-service needs of the teachers. This study found that Wyoming secondary agriculture teachers were in need of agricultural mechanics laboratory management in-service education in the areas of: first aid, correcting hazardous laboratory conditions, and general laboratory safety. Wyoming teacher educators, state agricultural education supervisory personnel, and local professional development coordinators should provide pertinent and continuous in-service education for Wyoming secondary agriculture teachers in the area of agricultural mechanics laboratory management through technical workshops, summer professional development conferences, and university instructed agricultural mechanics courses.

Introduction & Literature Review

In 1981, Worland High School in Worland, Wyoming, had recently moved into a new school building. Construction delays resulted in the heating system not being operational by the start of classes that year. Two students enrolled in a vocational agriculture course were wearing nylon vests to stay warm while they worked in the agricultural mechanics laboratory. The students were dismantling a 4-wheel-drive pickup, with plans to retrofit it into an irrigation pipe carrier. During the disassembly process, the students found the fuel tank skid pan bolts rusted solid, so they attempted to use an oxy-acetylene cutting-torch to cut the bolts. In doing so, they accidentally pierced the fuel tank and ignited the gasoline inside. The gasoline erupted into flames, severely burning both students. Fortunately, the sprinkler system in the new building was functional and quickly suppressed the fire. Both students were emergency air-lifted to a Salt Lake City hospital, where one of the students died from burns complicated by his nylon clothing. As a result of the accident, the state fire marshal mandated that all vehicles had to have the fuel tanks removed or emptied and flushed prior to being brought into the agricultural mechanics laboratory. Additionally, statewide safety workshops were required for all agriculture teachers who managed agricultural mechanics laboratories.

In the nearly 30 years that have passed since the mandatory training, many secondary agriculture teachers have retired. Currently, the only mandated agricultural mechanics laboratory safety training secondary agriculture teachers receive in Wyoming, is during their pre-service training in their teacher education program. Similarly, since 1981, the number of mandatory university instructed agricultural mechanics courses at the University of Wyoming has been reduced, which is not unlike other teacher education programs. Despite the lesser number of mandatory university instructed agricultural mechanics courses, many secondary agriculture teachers rely on the agricultural mechanics laboratory to offer students unique hands-on opportunities to develop valuable academic and vocational skills (Hubert, Ullrich, Lindner, & Murphy, 2003).

Phipps and Osborne (1988) noted that a total secondary agricultural education program consists of three essential and interdependent components: classroom and laboratory instruction; Supervised Agricultural Experience (SAE); and student participation in the National FFA Organization. Each of these three components often use laboratories as a way to further enrich student learning experiences. Phipps and Osborne proposed that the primary objective of agricultural mechanics education is the development of the abilities necessary to perform the mechanical activities to be done in agriculture." Johnson, Schumacher, and Stewart (1990) noted that students learn important psychomotor skills in agricultural mechanics education and that much of the instruction takes place in the school agricultural mechanics laboratory. According to Osborne and Dyer (2000) agricultural education laboratories provide opportunities for students to actively engage in scientific inquiry and application.

Much of the instruction of agricultural mechanics curriculum takes place in the laboratory setting (Johnson & Schumacher, 1989). Thus, a great deal of instructional time is spent in the agricultural mechanics laboratory. In many cases, up to two-thirds of the total instructional time in secondary agricultural education programs is devoted to laboratory instruction (Shinn, 1987). Furthermore, it has been estimated that in many courses, the time allocated for instruction in agricultural mechanics comprises 25% to 40% of the total instructional time (Phipps & Osborne, 1988). Because a substantial amount of instructional time is spent in agricultural mechanics laboratories throughout the U.S., it is imperative that secondary agriculture teachers receive agricultural mechanics laboratory management education.

Hubert et al. (2003) noted the importance of thorough laboratory instruction; "if skill development is the focus of laboratory instruction, then thorough attention to all its components, including safety instruction, is essential" (p. 3). Shinn (1987) noted that the agricultural mechanics laboratory must be a safe and well organized environment if optimum student learning is to occur. Johnson and Fletcher (1990) stated that agricultural mechanics students are exposed to equipment, materials, tools, and supplies that are potentially hazardous to their health and that could cause injury or death. Further emphasizing the importance of safety in the agricultural mechanics laboratory, Swan (1992) noted that instructional safety programs are a must, and therefore, should be of high priority to the instructor. The most important responsibility of the instructor is to ensure the safety of the students.

To provide a safe and efficient laboratory learning environment for agricultural mechanics students, agricultural educators must possess the proper knowledge and skills associated with the agricultural mechanics laboratory (Saucier, Schumacher, Funkenbusch, Terry, & Johnson, 2008). Dyer and Andreasen (1999) suggested that new agriculture teachers were inadequately educated in safety and experienced teachers were even less safety conscious. Despite numerous studies that have noted a need for agricultural educators to possess and apply proper knowledge and skills associated with the agricultural mechanics laboratory, many agricultural educators do not receive adequate education prior to beginning their teaching careers or after accepting a teaching position (Foster, 1986). Barrick and Powell (1986) found that first year agriculture teachers rated managing laboratory learning as a highly important ability for agriculture teachers. The first year agriculture teachers in their study also indicated that their level of knowledge concerning the management of laboratory learning was low.

In a study of secondary agriculture teachers, Johnson, Schumacher, and Stewart (1990) reported that in Missouri, agriculture teachers had the greatest in-service needs in the area of safety. Schlautman and Silletto's (1992) study conducted in Nebraska found that secondary agriculture teachers had in-service needs in the areas of agricultural mechanics laboratory management safety and policy implementation. Similar results were reported by Fletcher and Miller (1995) who reported that Louisiana secondary agriculture teachers were not using recommended safety practices or providing student safety and emergency equipment to the extent warranted by the hazards found in the agricultural mechanics laboratories. In a recent study conducted in Missouri, Saucier, Terry, and Schumacher (2009) reported that Missouri school-based agriculture teachers responsible for managing agricultural mechanics laboratories had professional development education needs in the areas of: maintaining and repairing agricultural mechanics laboratory tools and equipment, maintaining a safe agricultural mechanics laboratory, and storing, handling and disposing of hazardous materials.

Purpose and Objectives

According to the *National FFA Career Development Events Handbook* (2006), "an agricultural mechanics education is comprised of strong technical content and complimented by the development of practical, hands-on skills" (p. 43). Unless secondary agriculture teachers are competent in agricultural mechanics laboratory management, it is unlikely that they can safely and effectively guide agricultural education students in the development of practical, hands-on skills. A study to determine the competence and in-service educational needs of Wyoming secondary agricultural education teachers has not been conducted. Therefore, the purpose of this study was to describe the in-service needs of secondary agricultural education teachers in Wyoming who are responsible for managing an agricultural mechanics laboratory. The following research objectives guided the study:

1. Describe selected personal and professional characteristics of secondary agricultural education teachers in Wyoming.

2. Describe the perceived importance of selected agricultural mechanics laboratory management competencies by secondary agriculture teachers.

3. Describe secondary agricultural education teachers' perceived ability to perform selected agricultural mechanics laboratory management competencies.

4. Prioritize the agricultural mechanics laboratory management competencies and constructs in need of improvement, as perceived by secondary agriculture teachers.

Procedures

Population

The population for this non-experimental, quantitative study was secondary agriculture teachers in Wyoming during the spring of 2009. The *2008-2009 Wyoming Agricultural Education Directory*, included a total of 47 secondary agriculture teachers. Due to the relatively small number of subjects, a census (N = 47) was conducted to more accurately describe the characteristics of the population and eliminate potential errors associated with subject selection and sampling.

Instrumentation

The data collection instrument developed by Johnson, Schumacher, and Stewart (1990) and modified by Saucier, Terry, and Schumacher (2009) was used in this study. A two-section instrument was used to address the research objectives of this study. The first section consisted of a double-matrix containing 70 statements representing agricultural mechanics laboratory management competencies. The 5-point Likert-type scale, double-matrix allowed subjects to respond to each statement twice; once rating the perceived importance of each competency (1 = *No Importance*, 2 = *Below Average Importance*, 3 = *Average Importance,* 4 = *Above Average Importance*, 5 = *Utmost Importance*), and once rating the individual's ability to perform each competency (1 = *No Ability*, 2 = *Below Average Ability*, 3 = *Average Ability,* 4 = *Above Average Ability*, 5 = *Exceptional Ability*). The second section sought to identify individuals' demographic characteristics (e.g., age, gender, years of teaching experience, highest degree obtained).

The instrument developed by Johnson and Schumacher (1989) included 50 competencies developed through a modified Delphi technique, with input from a national panel of agricultural mechanics education experts, and was reported to be valid. Johnson, Schumacher, and Stewart (1990) modified Johnson and Schumacher's instrument to include a double-matrix format to assess the perceived importance of each competency and the perceived ability of the individual to perform each competency. A later study (Saucier, et al., 2009) modified Johnson, Schumacher, and Stewart's instrument by splitting multiple-component or *double-barreled* and *triple-barreled* competencies into single-component competencies; thus, the original 50 competencies were expanded to 70 competencies.

The design and format of the data collection instrument was guided by the suggestions of Dillman (2007). The electronic questionnaire was created and distributed to a panel of experts using Web-hosted software provided by Hosted Survey™ to assess face validity. The panel of eight experts consisted of faculty members from two Land-Grant Universities, the Wyoming State FFA advisor, and the researchers.

Saucier et al. (2009) assessed content validity of their instrument using a panel of experts that consisted of agricultural education and agricultural systems management faculty members who judged the instrument to be valid. The panel further identified five constructs: laboratory and equipment maintenance; laboratory teaching; program management; tool, equipment, and supply management; and laboratory safety. This study used the exact competencies previously determined to be valid in the study conducted by Saucier et al.; therefore, the constructs were considered to be valid.

To estimate reliability of the instrument for this study, Cronbach's alpha coefficients were calculated using data collected in a study of secondary agriculture teachers in Missouri during 2008 (*n* = 110). Because data were collected in a similar manner, from a sample with similar characteristics, using the same data collection instrument used in this study, the data were deemed appropriate to estimate reliability of the data collection instrument for use in this study. Therefore, Cronbach's alpha coefficients were calculated for the scales (importance and ability), yielding coefficients of .97 and .97 (*n* = 110) respectively. The Cronbach's alpha coefficients for the five constructs (Saucier, et al., 2009)—laboratory and equipment maintenance; laboratory teaching; program management; tool, equipment, and supply management; and laboratory safety—ranged from .87 to .90 (*n* = 110).

Methods

Dillman's (2007) data collection protocol was followed for this study. After five points of contact, a response rate of 78.70% (*n* = 37) was obtained. Non-response error was a relevant concern; therefore, procedures for handling nonrespondents were followed as outlined as *Method 2* in Lindner, Murphy, and Biers (2001). Days to respond was used as the independent variable in regression equations, where the primary variables of interest were regressed on the variable days to respond, which yielded no significant results (*p* = .182). Therefore, external validity did not threaten the generalizability of the findings of this study to the target population (Lindner, et al.).

Data Analysis

Data were analyzed using SPSS® version 17.0 for Windows™ platform computers. In determining the appropriate analysis of the data, the primary guidance was scales of measurement as outlined by Ary, Jacobs, Razavieh, and Sorensen (2006). Research objective one sought to describe the demographic characteristics of secondary agriculture teachers in Wyoming; thus, frequencies and percentages for gender, level of academic degree attained, and enrollment in agricultural mechanics courses during high school were reported. Mean and standard deviation were reported for age, length of teaching experience, and number of classes taught per semester that include agricultural mechanics competencies.

Research objective two sought to describe the perceived importance of selected competencies of agricultural mechanics laboratory management competencies by secondary agriculture teachers. Research objective three sought to describe secondary agricultural education teachers' perceived ability to perform selected agricultural mechanics laboratory management competencies. Secondary agriculture teachers were asked how important each competency was to them and what was their ability to perform each competency. Mean, standard deviation, minimum value, and maximum value were reported.

Research objective four sought to prioritize the agricultural mechanics laboratory management competencies and constructs in need of improvement, as perceived by secondary agriculture teachers in Wyoming. To determine where discrepancies existed, two ratings had to be taken into account simultaneously; hence, the Borich (1980) needs assessment model was utilized to determine the discrepancy for each competency. Mean weighted discrepancy scores (MWDS) were calculated for each competency using the MWDS calculator add-on for SPSS (McKim & Pope, 2010). To prioritize the competencies in need of attention, competencies were ranked, from high to low, using the mean weighted discrepancy scores. To prioritize the constructs in need of attention, a mean of MWDS (⍰$_{MWDS}$) was calculated for each construct. Constructs were then ranked from high to low, using the ⍰$_{MWDS}$. Competencies or constructs with high MWDS, or ⍰$_{MWDS,}$ indicated the areas needing the most improvement.

Findings

Research objective one sought to describe the personal and professional characteristics of secondary agricultural education teachers in Wyoming. Thirty-seven secondary agriculture teachers responded to the electronic questionnaire. Demographic data for gender, level of academic degree attained, and enrollment in agricultural mechanics courses during high school are reported in Table 1. Table 2 contains demographic data for age, length of experience, and number of classes taught per semester that include agricultural mechanics competencies.

Table 1
Selected Demographics of Secondary Agriculture Teachers in Wyoming (n = 37)

Characteristic	*f*	*%*
Gender		
Male	26	70.30
Female	11	29.70
Highest degree achieved		
Bachelor’s	23	62.20
Master’s	14	37.80
Enrolled in agricultural mechanics classes during high school		
Yes	29	78.40
No	8	21.60

Table 2
Selected Demographics of Secondary Agriculture Teachers in Wyoming (n = 37)

Characteristic	*M*	*SD*	*Min*	*Max*
Age	37.00	10.60	23	60
Years of teaching experience	11.86	9.51	1	35
Classes taught per semester that include agricultural mechanics competencies	4.03	1.99	0	7

Research objective two sought to describe secondary agriculture teachers’ perceived levels of importance of selected competencies of agricultural mechanics laboratory management. Providing students safety instruction (M = 4.89; SD = 0.31), selecting protective equipment for student use (M = 4.68; SD = 0.58), enforcing a student discipline policy (M = 4.65; SD = 0.59), and documenting student safety instruction (M = 4.62; SD = 0.59) were perceived to be the competencies with the highest levels of importance; all of which were related to maintaining a safe laboratory environment for students. Two competencies had mean importance values less than 3.0, and therefore, were perceived to have a below average level of importance: conducting an agricultural mechanics public relations program (*M* = 2.95; *SD* = 0.94), planning an agricultural mechanics public relations program (*M* = 2.81; *SD* = 0.88); both related to activities that do not take place in the laboratory environment.

Research objective three sought to describe secondary agriculture teachers' perceived ability to perform selected agricultural mechanics laboratory management competencies. Mean values of secondary agriculture teachers' perceived ability to perform selected competencies ranged from 2.95 to 4.29. Secondary agriculture teachers' perceived themselves as possessing an average ability to perform 90% (n = 60) of the 70 competencies. Secondary agriculture teachers' perceived themselves as possessing a below average ability to plan an agricultural mechanics public relations program (*M* = 2.95; *SD* = 0.74). Whereas, secondary agriculture teachers' perceived themselves as possessing an above average ability to perform six competencies: providing students safety instruction (*M* = 4.29; *SD* = 0.70), selecting protective equipment for student use (*M* = 4.16; *SD* = 0.73), developing a student discipline policy (*M* = 4.14; *SD* = 0.79), maintaining a student discipline policy (*M* = 4.05; *SD* = 0.85), documenting student safety instruction (*M* = 4.05; *SD* = 0.70), and safely handling hazardous materials (*M* = 4.00; *SD* = 0.75).

Research objective four sought to prioritize the agricultural mechanics laboratory management competencies and constructs in need of improvement, as perceived by secondary agriculture teachers in Wyoming. MWDS of agricultural mechanics laboratory management competencies ranged from 4.15 to -0.75. The competencies with the highest MWDS were related to safety, with the highest discrepancy (MWDS = 4.15) associated with administering first aid. One competency—ordering equipment/tools/supplies—had a MWDS of 0.00; therefore, no discrepancy existed. Seven competencies (10%)—silhouetting tool/ equipment cabinets (MWDS = -0.08); maintaining computer based student academic records (MWDS = -0.10); conducting an agricultural mechanics public relations program (MWDS = -0.24); planning an agricultural mechanics public relations program (MWDS = -0.38); storing protective equipment for student use (MWDS = -0.41); developing computer based lab management reports (MWDS = -0.49); and constructing welding booths, work benches, storage areas, etc. (MWDS = -0.75)—had negative MWDS and were considered a negative discrepancies. The negative MWDS indicates that the secondary agriculture teachers' perceived ability to perform each competency was higher than the perceived levels of importance of the associated competency.

Agricultural mechanics laboratory management constructs in need of improvement were ranked from high to low using the ⍰$_{MWDS}$. Laboratory safety was the construct most in need of improvement (⍰$_{MWDS}$ = 2.72); followed by laboratory and equipment maintenance (⍰$_{MWDS}$ = 1.51); laboratory teaching (⍰$_{MWDS}$ = 1.27); and tool, equipment, and supply management (⍰$_{MWDS}$ = 1.21). Program management (⍰$_{MWDS}$ = 1.27) was the construct least in need of improvement.

Additional data regarding secondary agriculture teachers' perceived levels of importance of agricultural mechanics laboratory management competencies, perceived ability to perform competencies, and MWDS of agricultural mechanics laboratory management competencies are presented in Table 3, ranked by MWDS. Definitions of agricultural mechanics laboratory management competencies (Saucier et al., 2009) are provided in Table 4. Grand means for importance of competencies, grand means for ability to perform competencies, and ⍰$_{MWDS}$ for agricultural mechanics laboratory management constructs are reported in Table 5.

Table 3

Wyoming Secondary Agriculture Teachers' Perceptions of Agricultural Mechanics Laboratory Management Competencies (n = 37)

			Importance		Ability	
Rank	Activity	MWDS	*M*	*SD*	*M*	*SD*
1	Administering first aid.	4.15	4.51	0.65	3.59	0.96
2	Correcting hazardous laboratory conditions.	3.95	4.57	0.60	3.70	0.78
3	Properly installing and maintaining safety devices and emergency equipment (e.g., fire extinguishers, first aid supplies, machine guards, etc.)	3.59	4.43	0.69	3.62	0.89
4	Safely disposing of hazardous materials (e.g., flammables, acids, compressed gas cylinders).	3.54	4.51	0.73	3.73	0.77
5	Maintaining the agricultural mechanics laboratory in compliance with OSHA standards.	3.51	4.32	0.75	3.51	0.80
6	Conducting regular safety inspections of the laboratory.	3.35	4.43	0.65	3.68	0.78
7	Modifying facilities to accommodate students with disabilities.	3.22	3.83	0.93	3.00	0.85
8	Developing a system to document achievement of student competencies.	3.12	4.27	0.77	3.54	0.84
9	Developing a maintenance schedule for agriculture mechanics equipment.	3.07	4.05	0.81	3.29	0.85
10	Providing students safety instruction.	2.91	4.89	0.31	4.29	0.70
11	Developing an accident reporting system.	2.88	4.43	0.65	3.78	0.89
12	Modifying equipment to accommodate students with disabilities.	2.84	3.76	0.89	3.00	0.78
13	Maintaining healthy environmental conditions in the laboratory.	2.72	4.38	0.68	3.76	0.68
14	Documenting student safety instruction.	2.62	4.62	0.59	4.05	0.70
15	Maintaining a student discipline policy.	2.62	4.62	0.59	4.05	0.85
16	Safely handling hazardous materials.	2.59	4.57	0.65	4.00	0.75
17	Developing a procedure to bill students for materials used in project construction.	2.49	4.19	0.70	3.59	0.80
18	Operating within the constraints of an agricultural mechanics budget.	2.49	4.19	0.78	3.59	0.96
19	Making major agricultural mechanics lab equipment repairs.	2.45	3.78	0.98	3.14	0.98
20	Selecting protective equipment for student use (e.g., safety eyewear.)	2.40	4.68	0.58	4.16	0.73
21	Safely storing hazardous materials.	2.28	4.43	0.77	3.92	0.86
22	Enforcing a student discipline policy.	2.26	4.65	0.59	4.16	0.83
23	Developing an identification system to deter tool/equipment theft.	2.19	3.86	0.75	3.29	0.85

(continued)

Rank	Activity	MWDS	Importance		Ability	
			M	*SD*	*M*	*SD*
24	Performing routine maintenance of agricultural mechanics lab equipment (e.g., adjust belt tension, lubricate moving parts, dress grinding wheels.)	2.02	4.16	0.60	3.68	0.88
25	Estimating time required for students to complete projects/activities.	1.98	3.86	0.79	3.35	0.75
26	Diagnosing malfunctioning agricultural mechanics lab equipment.	1.97	3.84	0.99	3.32	0.91
27	Arranging equipment in the agricultural mechanics lab to enhance safety/ efficiency/learning.	1.90	4.14	0.82	3.68	0.75
28	Developing a student discipline policy.	1.84	4.54	0.56	4.14	0.79
29	Developing educational projects/activities for students.	1.81	3.95	0.81	3.49	0.80
30	Developing a written statement of agricultural mechanics lab policies/ procedures.	1.78	4.38	0.76	3.97	0.87
31	Developing procedures to facilitate the storage/checkout/security of tools/equipment.	1.70	3.70	0.78	3.24	0.80
32	Developing an agricultural mechanics laboratory budget.	1.68	4.14	0.67	3.72	0.87
33	Maintaining protective equipment for student use (e.g., safety eyewear.)	1.65	4.35	0.82	3.97	0.73
34	Recognizing characteristics of quality tools/equipment.	1.55	4.10	0.70	3.73	0.80
35	Developing objective criteria for evaluation of student projects /activities.	1.52	4.03	0.64	3.68	0.72
36	Updating agricultural mechanics course offerings.	1.50	3.70	0.88	3.28	0.81
37	Promoting laboratory safety by color coding equipment/marking safety zones/posting appropriate safety signs and warnings.	1.44	3.81	0.97	3.43	0.83
38	Developing an adequate inventory of laboratory consumable supplies.	1.38	3.92	0.76	3.57	0.83
39	Developing a file of service/operator manuals for agricultural mechanics lab equipment.	1.35	3.84	0.87	3.49	0.93
40	Equipping work stations for each skill area (e.g., cold metal, arc welding, small engines, electricity, etc.)	1.28	3.95	0.81	3.62	0.86
41	Developing a procedure to insure proper agricultural mechanics lab clean up.	1.22	4.11	0.77	3.81	0.81
42	Making minor agricultural mechanics lab equipment repairs.	1.20	4.02	0.76	3.73	0.90
43	Utilizing technical manuals to order replacement/repair parts for agricultural mechanics lab equipment.	1.14	3.84	0.80	3.54	0.90
44	Maintaining a file of service/operator manuals for agricultural mechanics lab equipment.	1.11	3.72	0.73	3.43	0.83

(continued)

Rank	Activity	MWDS	Importance *M*	Importance *SD*	Ability *M*	Ability *SD*
45	Making minor repairs to the agricultural mechanics laboratory facility.	1.09	4.03	0.73	3.76	0.68
46	Installing stationary power equipment (e.g., assembling equipment, connecting to a power source, performing preliminary adjustments.)	1.08	3.65	0.86	3.35	0.86
47	Arranging for a professional service person to make major equipment repairs (e.g., replace switches bearings.)	1.02	4.19	0.81	3.95	0.88
48	Identifying equipment required to teach agricultural mechanics skills.	1.01	4.14	0.67	3.89	0.88
49	Identifying supplies required to teach agricultural mechanics skills.	0.98	4.02	0.76	3.78	0.85
50	Developing a rotational plan to move students through agricultural mechanics skill areas.	0.98	3.62	0.95	3.35	0.95
51	Maintaining an adequate inventory of consumable supplies.	0.92	3.78	0.71	3.54	0.69
52	Maintaining a file of educational projects/activities.	0.90	3.45	0.69	3.70	0.70
53	Selecting current references/technical manuals.	0.85	3.49	0.69	3.24	0.68
54	Developing a file of educational projects/activities for students.	0.81	3.73	0.80	3.51	0.73
55	Identifying tools required to teach agricultural mechanics skills.	0.66	4.08	0.76	3.92	0.89
56	Identifying current references/technical manuals.	0.65	3.46	0.65	3.27	0.61
57	Planning student recruitment activities for the agricultural mechanics program.	0.65	3.46	1.04	3.27	0.96
58	Conducting shop inventory (e.g., tools/equipment/consumable supplies.)	0.64	3.97	0.69	3.81	0.78
59	Implementing student recruitment activities for the agricultural mechanics program.	0.64	3.40	0.90	3.21	0.89
60	Designating work stations for each skill area (e.g., cold metal, arc welding, small engines, electricity, etc.)	0.60	3.70	0.81	3.54	0.73
61	Developing procedures for efficient storage/distribution of consumable supplies.	0.50	3.68	0.85	3.54	0.69
62	Preparing bid specifications for equipment/tools/supplies.	0.46	3.40	0.83	3.27	0.80
63	Ordering equipment/tools/supplies.	0.00	3.59	0.72	3.59	0.69
64	Silhouetting tool/ equipment cabinets.	-0.08	3.03	1.01	3.05	1.00
65	Maintaining computer based student academic records.	-0.10	3.72	0.87	3.76	0.83
66	Conducting an agricultural mechanics public relations program.	-0.24	2.95	0.94	3.03	0.83
67	Planning an agricultural mechanics public relations program.	-0.38	2.81	0.88	2.95	0.74

(continued)

			Importance		Ability	
Rank	Activity	MWDS	*M*	*SD*	*M*	*SD*
68	Storing protective equipment for student use (e.g., safety eyewear.)	-0.41	3.78	0.82	3.89	0.66
69	Developing computer based lab management reports.	-0.49	3.00	0.97	3.16	0.88
70	Constructing welding booths, work benches, storage areas, etc.	-0.75	3.46	0.80	3.68	0.97

Note: Importance Scale: 1 = No Importance, 2 = Below Average Importance, 3 = Average Importance, 4 = Above Average Importance, 5 = Utmost Importance; Ability Scale: 1 = No Ability, 2 = Below Average Ability, 3 = Average Ability, 4 = Above Average Ability, 5 = Exceptional Ability

Table 4
Definitions of Agricultural Mechanics Laboratory Management Competency Constructs (Saucier et al., 2009)

Competency Construct	Definition
Laboratory safety	Activities that an agriculture teacher must perform to maintain a safe laboratory learning environment
Laboratory and equipment maintenance	Maintenance activities that an agriculture teacher must perform to keep the laboratory and equipment in working order
Laboratory teaching	Educational activities conducted in the laboratory by the agriculture teacher to ensure academic and vocational success
Tool, equipment, and supply management	Activities conducted by the agriculture teacher to ensure that all tools, equipment, and supplies are secured and in proper quality and quantity to facilitate the learning process
Program management	Activities conducted by the agriculture teacher to plan, guide, assess, and evaluate the agricultural mechanics program

Table 5
Wyoming Agricultural Mechanics Laboratory Management Competency Constructs Ranke$_{\text{MWDS}}$ *(n = 37)*

			Importance		Ability	
Rank	Competency Construct	MWDS		*SD*		*SD*
1	Laboratory safety	2.72	4.40	0.43	3.79	0.52
2	Laboratory and equipment maintenance	1.51	3.90	0.47	3.51	0.55
3	Laboratory teaching	1.27	3.98	0.48	3.67	0.56
4	Tool, equipment, and supply management	1.21	3.86	0.48	3.57	0.51
5	Program management	1.12	3.77	0.51	3.50	0.50

Conclusions–Implications–Recommendations

Wyoming secondary agriculture teachers require in-service training to address discrepancies that exist between the teachers' perceived importance of agricultural mechanics laboratory management competencies and their ability to perform the competencies. Although secondary agriculture teachers in Wyoming varied greatly in experience from one to 35 years, more than one-third hold a master's degree, and most had at least participatory experience in agricultural mechanics as high school students. Nonetheless, the average secondary agriculture teacher in Wyoming is required to teach four courses per semester that involve some facet of agricultural mechanics.

Secondary agriculture teachers in Wyoming recognized agricultural mechanics laboratory management competencies as being important. Nearly all of the competencies were determined to be at least of average importance, nearly half of which were perceived as being of above average importance. Secondary agriculture teachers' perceived themselves as being able to perform most of the competencies at an average level and very few competencies at an above average level. Most of the agricultural mechanics laboratory management competencies that Wyoming secondary agriculture teachers require in-service education in are related to safety. Similarly, agricultural mechanics laboratory management constructs in need of improvement were related to tasks required to maintain a safe laboratory learning environment and to keep the laboratory and equipment in working order. Wyoming secondary agriculture teachers are most competent in program management activities that are necessary to plan, guide, assess, and evaluate the agricultural mechanics program.

Secondary agriculture teachers must be competent and knowledgeable. In some cases, teachers must teach up to seven courses per semester, possibly early in their careers and with limited experience. Agricultural mechanics laboratories can be an invaluable resource to agriculture teachers. Well prepared and knowledgeable agriculture teachers can safely and effectively guide agricultural education students in the development of practical, hands-on skills and agricultural mechanics education. However, without competent and knowledgeable agriculture teachers, the agricultural mechanics laboratory can quickly become an underutilized and unsafe environment.

In-service education is necessary to address discrepancies that exist between the teachers' perceived importance of agricultural mechanics laboratory management competencies and their ability to perform the competencies. In-service education cannot address all discrepancies at once; therefore, pertinent and continuous in-service education should be facilitated each year and focus on one agricultural mechanics laboratory management competency at a time beginning with the highest priority construct—laboratory safety. To further address the in-service discrepancies of secondary agriculture teachers, teacher education programs must provide the necessary pre-service coursework to develop well prepared and knowledgeable agriculture teachers who can safely and effectively educate students in the development of agricultural mechanics knowledge and competencies. A longitudinal study of pre-service and in-service secondary agriculture teachers' perceived importance of agricultural mechanics laboratory management competencies and their ability to perform the competencies would provide teacher education programs an additional gauge of the adequacy of agricultural mechanics curriculum in their preservice teacher education program.

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Visual Communications: An Analysis of University Students' Perceptions of Rural America Based on Select Photographs

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Abstract

Since the 1920s urban populations have out-grown rural populations. Studies exploring the shift in rural residents have noted items such as job market, economy, and conveniences as factors of this change, but few studies have been completed to examine medias' role in this trend. The purpose of this study was to explore college students' perceptions about rural America, based on images selected from newspapers. This study consisted of five focus groups. Two focus groups were conducted during the 2009 Agricultural Communicator's of Tomorrow's (ACT) Professional Development Conference in Stillwater, Oklahoma, (agricultural student focus) and three were conducted at Texas A&M University (primarily urban student focus). The focus groups followed Krueger's (1998a, 1998b) method of questioning. The focus groups were recorded, transcribed, and analyzed. Results indicated that students studying agriculture had several ties to rural America. Participant's responses from the agricultural and primarily urban groups lead to common themes as well as differing themes. The study noted that further research must be conducted to understand the total affects media has on the perceptions of rural America.

Introduction

While perceptions of rural America tend to be positive (Kellogg, 2001 & 2002) rural areas are seeing a decline in population (Amber Waves, 2003; ERS, 2008). Isserman (2001) noted "much of what we consider rural America today will be urban America in 2050" (p.128). Literature indicates that both young and old people are moving to areas with more resources and amenities (Amber Waves, 2003; Rogers, 2002). The largest number of people moving out of rural areas in the mid 1990s was college graduates (Cromarite, 2001). Isserman (2001) describes the primary economic source in rural areas as farms, ranches, forest, and mines. He also classifies rural as small towns and cities where "the pace is a bit slower, the crimes fewer, and the children above average" (Isserman, 2001, p. 128).

A 2001 Kellogg Foundation study surveyed 242 rural, suburban, and urban Americans. Both the rural and non-rural participants perceived that agriculture was the largest part of economies in rural areas; however, only 11.7 percent of jobs in rural areas are in agriculture. According to this study, nearly half of the respondents living in rural areas had considered moving due to low pay and limited opportunity for advancements in their current location. Of the respondents, 75 percent indicated that rural area residents have stronger families than people living in cities (Kellogg, 2001, 2002). A large number (53%) of participants believed rural Americans were harder-workers than those from the city (Kellogg, 2001).

Research has found that young people settling down tend to avoid remote, sparsely settled areas that do not have the many conveniences of urban areas (Amber Waves, 2003; Rogers, 2002). Other concerns identified in rural areas include poverty rates, health care, and a lack of other services (Kellogg, 2002). It is often harder for rural residents to access health care services (Rogers, 2002), and lack of health care options may influence a person's choice to move to rural areas. Children living in rural areas are more likely to live in households that fall below the poverty line, and these children have higher mortality rates than children in non-rural areas (ERS, 2008). In 2005, 95 percent of the 100 counties with the highest poverty rate were rural (O'Hare & Mather, 2008).

Research shows that a decrease in farming is not the reason for rural population loss, but a lack of natural amenities, resources, and services (Amber Waves, 2003; Rogers, 2002). Many geographic areas including the East, Mid-Atlantic, and South have seen an increase in suburbs growing out of cities (Kellogg, 2002), which is known as urban sprawl. The agricultural land is replaced with luxury homes causing land prices to increase. Many rural residents are then unable to afford to stay in their communities (Kellogg, 2002).

Residents of rural areas tend to be of a lower education level, lower income level, and have a higher probability of being unemployed then urban residents (Marans et al., 1980). The result is young people leaving rural areas in search of higher education and job opportunities (Kellogg, 2002), and these individuals are increasingly less likely to return. Research priority area (RPA) 2 in the *National Research Agenda (NRA): Agricultural Education and Communication, 2007-2010* notes the explicit need to aid the public in effectively participating in decisions making related to agriculture (Osborne, n.d). Research should focus on media's role in influencing young people's decisions whether or not to live in a rural area.

Media's Role

Research conducted before the 1980s on media affects began to show that media did not tell audiences what to think, but what to think about. More recent research has shown that media has a more significant role in influencing audiences than originally found in previous years (Entman, 1989; Wanta, Golan, & Lee, 2004). Many studies have explored the traditional definitions of media, but few have looked at these effects in terms of media images.

"Visual images are very powerful in their occupation of the publics' time and the shaping of how we process our surrounding environments" (Sadler-Trainor, 2005, p. 9). Additionally, visual images play an important role in society due to the messages these images can portray, both positive and negative, regarding social class, cultures, etc. (Rhoades & Irani, n.d.). "It is imperative as communicators that we continue to study how rural cultures are portrayed in the media" (Rhoades & Irani, n.d., p. 24). "Photographs and images on video are typically seen as direct copies of reality" (Messaris, 1997, p.vi). However, images seen daily such as street signs, graphic designs, and even music notes cause people to think about what the image represents and interpret its meaning differently (Lewis, 1995).

People see several images a day, and images in newspapers are often looked at prior to reading the text (McLellan & Steele, 2001; Rosen, 2007). Not all images are positive, in fact many can negatively affect perceptions of certain people and programs (Singletary & Lamb, 1984; Smith & Price, 2005; Sotirovic, 2001).

Guiding Theories

Several theories and models guided this study; the Interpreter Model, theory of Ominhasism, and Semiotics. The Interpreter Model was developed by David K. Berlo (The Association for Educational Communications and Technology, 2004). This model denotes that whenever humans communicate there is a stimulus present. A stimulus is anything that can be perceived by one of the five senses (touch, see, hear, smell, and taste) and every stimulus has a response. Once an individual receives a stimulus the response is the action taken (for example an individual smells smoke and, therefore, runs out of the house). Denoted in the model an individual has the ability to both decode and interpret the stimulus.

Philosopher and photographer Rick Williams developed the theory of omniphasism. This theory combines rational and gut reaction thoughts into balanced and equal thoughts to analyze an image (Lester, 2006). Williams uses an eight-step approach. He has viewers look at the image then list primary words. The viewer is then to write associative words with the primary words. The process continues with one of the most significant associative words being picked. The viewer continues this process until they use the primary and significant word pairs to create meaning with things in the viewers' own life.

Barthes developed a theory regarding photographs in newspapers and their logico-semantic relationship to surrounding texts (as cited in Barr,2007).The theory notes that photographs represent the reprint of an actual event and an implied meaning, which viewers make according to their own interactions, experiences, and understandings of culture codes. Barr explained that photograph meanings are fusions between the viewer's personal experiences and the cultural codes (personal and decoded by the viewer). Researchers like Saussure and Locke furthered such ideas with their work in semiotics (Craig & Muller, 2007; Moriarty, 2005). The philosophers indicated that images are expressed through the relationship as the signifier (or the image) and the signified (or what the concept the sign stands for). Such as a tent would be a signifier and the signified would be camping. Thus, every image brings to mind a different signified in the viewers' mind. Ronald Barthes and Stuart Hall expanded this semiotic definition to further examine non-language-like signs through the concept of images' connotative and denotative meanings (Moriarty, 2005).

Purpose and Research Questions

The purpose of this study was to determine if selected images of rural America printed in newspapers affected college student's perceptions of rural America; and if the images affected the desire for students to return or move to a rural area after completing their degrees. The research objective (RO) and questions (RQ) for this study were:

RO1: Identify select demographics of participants.
RQ1: What are college students' perceptions of rural America?
RQ2: What are college students' perceptions of selected images of rural America?
RQ3: What are college students' perceptions of how students with different backgrounds perceive rural America?
RQ4: Identify college students' perceptions of factors inhibiting movement to rural areas?
RQ5: Do college students' feel media images affect the desire to live in a rural area?

Methods and Procedures

Focus groups for this study were conducted at the National Agricultural Communicators of Tomorrow (ACT) 2009 Professional Development Conference in Stillwater, Oklahoma, and at Texas A&M University. Participants in the agricultural related focus groups were selected by reference. One week prior to the beginning of the conference, advisors of each university were sent a letter (via e-mail) requesting that two students participant in the study. The advisors were asked to provide student names to the researchers. Of the 11 universities in attendance at the conference, 10 universities participated in the study. One student from each of the participating universities was randomly placed into one of two groups. For the primarily urban focus groups, students enrolled in a general communications course were targeted. An e-mail offering bonus points was sent out one week prior to the focus groups. The participants were asked to go to a web site and sign-up for a specific focus group time and the room location was provided.

A researcher searched the Internet for images printed in newspapers depicting what the researcher believed to be rural America. Faculty members from three universities assisted the researcher in selecting five images to be used during the focus groups. A moderator guide was developed to guide the focus groups. This guide was reviewed by faculty members from the [Universities] and adjustments were made. When designing a focus group it is important to ask the correct type of questions. This study followed Krueger's (1998a, 1998b) method for questioning. Krueger (1998a) expressed that during focus groups some questions are more important than others. Questions are assigned different levels of importance. This determines how much time is spent discussing the question and at what level the question is analyzed. There are five types of questions that affect the flow of the focus group: opening, introductory, transition, key, and ending (Krueger, 1998b). This study followed these questions and specific techniques. Additionally, to understand the differing backgrounds of each participant, a demographic survey was administered immediately following each focus group.

During the agricultural focus groups, participants met in one room and divided into two groups. One group moved to another location. Snacks and water were offered to participants while they completed consent forms. Four tables where placed in as close to a circle shape as possible. Two audio recorders were placed in the middle of the group and on opposite sides. The moderator and observer were seated at a table at one end of the focus group. A scribe was seated outside the focus group circle and to one side. The screen for the images was on one end of the participants and opposite the moderator and observer. For the primarily urban focus groups, participants reported to a specified location. There were five tables placed together making one long table. Four recorders were set in the center of the tables. The scribe was seated outside the group. The moderator and observer set at one end of the participants with the screen behind the moderator. The observer kept time and observed participant's facial expressions and body language. The scribe took notes of what each participant and moderator said during the focus group.

After having participants answer a series of questions about rural America, the participants were shown the five images previously selected. Participants were asked to write down their initial thoughts and reactions regarding each image on an index card. Participants were given five different colored index cards; each color was assigned to a specific image. After the participants recorded their initial reactions the moderator asked questions to initiate discussion regarding each image.

The study maintained peer debriefing and member checks. At the end of each focus group, the moderator summarized participants' responses from the session and asked whether or not anything was missed or whether the participants wanted to clarify anything the moderator had misinterpreted. Transferability in this study is limited to the focus group participants. Though generalization does not exceed that of the groups, it gives future researchers insight into how similar groups could react in future studies. Dependability was met by audio recording each focus group and initial reactions to images were recorded on index cards. This study maintained triangulation. In each of the focus groups three different sets of notes were taken by the scribe moderator, and observer. The moderator took notes of major themes emerging from each image. The observer watched and recorded body language and facial expressions. The scribe kept notes of the focus group conversation. Following each focus group the audio recordings, note cards, and moderator notes were transcribed and analyzed to identify research themes in the study. A researcher reiteratively read through the data in order to identify recurring specific ideas or themes. These themes were identified as important and supported with details such as quotations, passages, and field notes taken from interviews and observations (Creswell, 1998).

Results and Findings

Agricultural Group Demographics

Of the 20 participants, 18 were female (90%) and all participants classified themselves as Caucasian. Within the two focus groups, there was one freshman, one sophomore, eight juniors, and 10 seniors. Participants in the study represented 10 universities: California Polytechnic State University, Kansas State University, The Ohio State University, Oklahoma State University, Texas A&M University, Tarleton State University, Texas Tech University, University of Arkansas, University of Florida, and University of Nebraska, Lincoln. Of the focus group respondents, 60% noted growing up on a farm. Ninety percent of participants in one group and 80% in the second group had grown-up in a rural community. Eighty percent of participants in one focus group and 50% in the other focus group had grown-up in a community of less than 25,000 people. The mean age was 20.5 and 20.9, respectively.

When asked if their parents or a close relative had every owned or operated a farm or ranch, one focus group reported a 100% "yes" response rate and the other focus group yielded a 80% response rate indicating "yes". Of the 18 participants that answered the question "What economic status level would you say you came from," the greater majority (44.4%) responded $50,000 to $74,999 annually. The second largest response was $100,000 to $149,999 annually (27.8%). Two participants reported levels less than these numbers and two reported higher figures. Three respondents did not indicate their economic level. When responding to the question "do you plan to live in a rural area in the future," one focus group had an 80% response rate of "yes" and the second group held a 90% response rate of "yes."

Primarily Urban Group Demographics

Of the 28 participants 19 were female and 77.8 % of participants classified themselves as Caucasian, 14.8 % as Hispanic, and 7.4 % as Asian. Compiling the three focus groups based on level of education at post secondary studies, six indicated freshman, two sophomore, 10 juniors, nine seniors, and one graduate student. All participants responded that they had not grown-up on a farm, and only 7.1 % of participants had grown-up in a rural community. Of the participants that responded, 54.2 % reported growing-up in a community of more than 250,000, 25 % grew-up in a community of 100,000-249,999, and 12.5 % grew-up in a community of 25,000-99,999. None of the participants reported growing-up in a community of less than 3,500. For these three focus groups, the mean age was 20.3 years with the highest age reported being 28.

When asked if their parents or a close relative had every owned or operated a farm or ranch, 56 % responded no. Of the 23 participants that answered the question of "what economic status level would you say you came from," eight responded over $150,000 annually. The second largest response was $125,001 to $150,000. The third highest level was $100,001 to $125,000. All other respondents reported lower income levels. When responding to the question "Do you plan to live in a rural area in the future," 87.5 % said "no" and 12.5 % said "yes".

Emerging Theme Areas
All five focus groups were analyzed and key terms and phrases were then compressed into 10 unique themes: *culture / values*, *experience from environment*, *experience through observation*, *lack of accurate information*, *lack of technology*, *media impact / framing*, *occupation*, *proximity*, *relationship / ties*, *and stereotypes*. Themes are represented in *italics* and key terms representing the themes are underlined in the discussion of results. Comments denoted with A and B are representative of the agricultural group, and comments denoted with C, D and E are representative of the primarily urban group.

Image One

Figure 1. Photograph accompanying an August 2008 New York Times article, titled *In Rural New York, Windmills can Bring Whiff of Corruption.* Accessed online at http://www.nytimes.com/2008/08/18/nyregion/18windmills.html?_r=1&pagewanted=all

For image one, the agriculture based focus groups maintained eight major themes *advancement / technology, culture / values, efficiency / conservation*, *experience from environment*, *experience through observation*, *media impact / framing, relationship /ties*, and *stereotypes*. Seven themes were delineated from the primarily urban focus groups *culture / values*, *efficiency / conservation*, *experience from environment, experience through observation*, *media impact / framing, proximity,* and *stereotypes*. Terms used to describe the *efficiency / conservation* theme were saving energy, preserving energy, and conserve energy. One participant expressed this theme by saying, "wind generators, she wants to save energy" (D3). Words and phrases used to express the *proximity* theme were ability to hang up clothes (because of the space) and town is 20 miles away. Focus groups mentioned that maybe she could not afford or did not have a washer and dryer.

Words and phrases that emerged from for the agricultural groups theme *relationships/ties* were family, mom / grandmother does that, and relating to their farm. For the *stereotypes* theme participants used key terms, such as white trash, poor, and housewife doing chores. One participant expressed that thought with the statement "I can see where you thought for a lack of a better term 'white trash', that's what I thought too" (B4). The primarily urban group identified with *culture / values*, and participants used key terms, such as work ethic, traditional, and simplicity of rural America. One participant said, "I guess it just kind of describes the simplicity of rural America" (C4).

A majority of the agricultural groups found this image to be a neutral representation of rural America. Agricultural participants used terms such as: shocked at how much ground, in the city, you don't have a front or backyard, and wouldn't see the wind turbines to describe how someone from a primarily urban background might describe the image. The primarily urban group had a majority of neutral or positive responses. The primarily urban group thought that those from a rural background would be able to relate to the image, and thought this image would be more normal to them. In general, the primarily urban group believed someone from a rural background would describe this image as just doing laundry, "did that this morning," and normal. One participant from the primarily urban group said, "We did that this morning," (C6).

Image Two

Figure 2. Photograph accompanying an August 2007 New York Times article, *Ethanol is Feeding Hot Market for Farmland*. Accessed online at http://www.nytimes.com/2007/08/08/us/08farmers.html

For the second image, the themes that emerged for this image from the agricultural groups were *culture / values*, *experience from environment*, *experience through observation*, and *relationship / ties.* For the primarily urban group themes that emerged were *culture / values*, *experience from environment*, *experience through observation*, *proximity* and *stereotypes.* For the theme of *experience through observation* the words and phrases that emerged were: can't do this in the city, crops represent rural, and animals represent rural. One participant explained the theme by saying, "Rural agriculture if you want to link it to agriculture is crops and livestock" (E5).

From the agricultural group, day in the life of a farmer / rancher, I've done this, and that calf is tame were words used to express *experience from environment.* One participant said, "The guy in the background is tailing that cow" (A1). My dad and I working cattle and family were some of the words used to describe the *relationships/ties* theme from the agricultural group. A participant related the situation to their own life, "Seeing the two guys together, I thought, well they're family like that's my dad pushing the other cow away so I can take the calf" (A8). The primarily urban groups had an emerging theme of *proximity*. Words used to describe this theme were [image is rural] because you see lots of land, land goes on forever, and no buildings or flues. One participant related the situation to their own life, "I just noticed how open it was and how much land they were on and again, you don't really see any buildings" (C4). Some participants from both the agricultural and primarily urban group mentioned PETA.

The agricultural participants felt the image was positive for people who understood what was going on, but negative for people who did not understand what was being done. Agricultural participants verbalized this image as him doing his job, the lifestyle of a rancher, and a normal day. The primarily urban participants thought the image was negative due to the pain inflicted on the calf. They believed that individuals from a rural background would note the image as nothing special, pride, and/or normal duty. One participant expressed, “This is what I would think of when I think of rural, what I picture people doing” (E11). Another primarily urban participant said, “Maybe if you gave this picture to somebody that’s in PETA or something they would go crazy, but if you gave it to a farmer they’d say it’s a normal daily activity” (E7).

Image Three

Figure 3. Photograph accompanying an April 2007 New York Times article, titled *Trailer-Park Sales Leave Residents with Single-Wides and Few Options*. Accessed at http://www.nytimes.com/2007/04/18/nyregion/18trailer.html

Discussion of the third image led to the creation of six themes from the agricultural participants’ comments. *Culture / values*, *experience from environment*, *experience through observation*, *media impact /framing*, *relationship /ties*, and *stereotypes*. Participant comments in the primarily urban groups were compressed into six themes *culture / values*, *experience from environment*, *experience through observation*, *proximity*, *relationship / ties*, and *stereotypes*. With the *stereotypes* theme participants tied the image to low income, “trailer trash”, “ghetto”, and economic status. “I thought about the economic status. I thought well maybe because they are trailer trash. They can’t afford a babysitter” (B2). Key terms for the *relationships/ties* theme were: family, grandparents, and where’s the dad? A participant comment reflecting the theme was “they could be visiting a grandparent” (D7).

The agricultural participants had two different themes *media impact / framing* and *experience through observation.* Terms for the *media impact / framing* theme were movies depict trailer parks bad, *8 Mile*, and *Sweet Home Alabama.* A comment illustrating this theme was, “I think in movies that they depict trailer communities as bad names such as white trash people fighting, beating their spouses and stuff are all in trailer parks” (A9). Words used to describe *experience through observation* were seen this in my community, only seen in urban areas, and this is where you would find drugs and gangs in my hometown. “because, where I live at we’re very sheltered, we’re very way out there, so when we go to town that’s the type of thing we see, so I thought of urban when I saw it” (A6).

The agricultural participants viewed the image as positive because of the family, close-knit, love that was displayed. However, they also indicated that it was negative because of how others might view this image. Agricultural participants said they thought someone from a different background than themselves would say things like “oh sick” (B7). The primarily urban group had some participants say positive for the sense of family and love, but negative because it might not be the ideal image for a family. Participants in the primarily urban group said they thought someone from a different background than themselves would be offended or think this was a “bad stereotype” (C7). Participants from two of three primarily urban groups mentioned that the image could not be a rural area because of the power lines and telephone poles in the background. Some participants believed that these amenities would not be available in a rural setting or would have greater separation in the lines.

Image Four

Figure 4. Photograph accompanying a February 2006 Arkansas Democrat-Gazette article, titled *Flea Markets Bring Income to Rural Areas.* Accessed online but story/ photograph is no longer available digitally.

The themes for this image from the agricultural group were *culture / values*, *experience from environment*, *experience through observation*, *relationships / ties* and *stereotypes.* Themes from the primarily urban group were c*ulture / values*, *experience from environment*, *experience through observation*, *relationships / ties*, and *stereotypes*. Words and phrases such as <u>conversations barber shop atmosphere</u>, <u>“home”</u>, and <u>know everyone</u> were used to describe *culture / values.* You can tell it’s an antique store, because he has prices on stuff” (A5). The *relationships / ties* theme was summarized in words and phrases such as <u>friends</u>, <u>grandfather</u>, and <u>chatting with each other</u>. “I mean it looks like you’ll go there and you’ll see friends” (E6). For the *experience through environment* theme words and phrases like <u>know you by name</u> and <u>talking about the weather</u> were used. “I can imagine sitting in this store on a stool listening to old wives tales” (B4).

Participants in the agricultural group were able to relate to the *experience through observation* theme. <u>hometown feel</u>, <u>come in every morning</u>, and <u>telling stories</u> were some key words used to describe this theme. “It reminded me of when I went to school, it was on the outskirts, there’s a little restaurant called the ‘Farmer’s Den’. It opened at four in the morning, the same people every single morning would go, and all the farmers would go sit around, have a cup of coffee, have their breakfast before they went out and they were just like, every day at the exact same time, exact same people, everybody knows everybody, they always stopped in , you know. So, it just reminded me of that” (B9).

For the agricultural group, participants thought it could be negative, because of how others might see it, but positive because of the friendliness. The agricultural participants thought someone from an urban background would think of a lack of technology, might think the men were <u>arguing</u> and would not envision themselves in that environment. One participant expressed this with the statement “they’d probably never walk in” (B2). The primarily urban group thought the image could be seen as negative for the clutter in the store and positive for the friendliness and community. The primarily urban participants thought someone from a rural background would think this was normal, or that they could relate to the store.

Image Five

Figure 5. Photograph accompanying an August 6, 2008 New York Times article, titled *Niche Farming Offers Way Back to the Land.* Accessed at http://www.nytimes.com/2008/08/07/business/smallbusiness/07hunt.html

The last image themes that emerged in the agricultural group were *culture / values*, *experience from environment*, *experience through observation*, and *relationship / ties.* The primarily urban group developed the following themes *culture / values*, *experience through observation, proximity*, and *stereotypes*. Terms such as: looked fun, their job, and what I think of when I think rural, they grow crops were used to describe the *experience through observation* theme. One participant's comment is an example of the theme, "I think they're going to a party," said one participant (E4).The theme of *culture / values* generated such words as normal and hard-working. "That's just normal or they're goofing off," said one participant (B3).

The participants in the agricultural group had a *relation/ties* theme. Participants discussed spousal and sibling relationships. The participants in the primarily urban group talked about the acreage, it's hot, and have a lot of land which was used to create the *proximity* theme. One participant expressed this theme by stating, "The obvious acreage in the back" (D3).

Most participants in both the agricultural and primarily urban groups thought the image was positive. Some participants in the agricultural group thought others from a differing background would think it was redneck; while other participants in the agricultural group said the perception of someone from a non-rural background would be that it looked like fun. Some participants in the primarily urban group thought others from a different background than their own would be able to relate because either they had done something similar or knew what they were planting.

Image Summary

The themes in both the primarily agricultural group and the primarily urban group are similar, but when analyzed deeper, the context behind the groups changes. In the *experience from environment* theme, participants in the agricultural group related to their own experiences working on the farm, while the primarily urban group discussed experiences such as my family has a farm or you would not find this image in the city.

The participants in the agricultural group had a more vivid, descriptive discussion of the images. These participants' related aspects within each image back to their personal lives, while the primarily urban group participants' did not.

The primarily urban group thought rural America was lacking appliances, electricity, and telephones in the *stereotypes* theme. The agricultural group's *stereotypes* theme was created from key words and phrases focused on how someone not from a rural background would think / behave / react negatively about rural America, as represented in the image.

The research found that the agricultural group could relate to the image from experience through environment, while the primarily urban group could only relate to the images by experience through observation. After graduating from college, a majority of the agricultural participants expressed a desire to return or move to a rural area; however, they were not sure if that would be possible. Several said that while they are single, living in the city would be fine, but once they have a family they would prefer to live in a rural community.

A majority of the primarily urban participants expressed a desire to return or move to an urban area. Some had considered living in a rural area. One participant expressed that thought with this statement, "I think it's a nice thought to like have your own land and no one bothers you, but in reality I really wouldn't want to become accustom to that having to do all that extra work, like driving out to go to the store or something when I'm use to just going around the street to Wal-Mart" (E1). The primarily urban group felt it might be easier for dating and meeting new people in urban areas.

Participants were asked to identify factors they believed kept people from moving to rural areas. Participants said *economics w*as one factor; with several participants mentioning that *jobs* and *money* were located in larger cities. A participant exampled this factor by saying, "I see myself as winding up living in a large city because [that is where] these big companies are being based" (A4). Another factor participants identified as keeping people from rural areas was *convenience.* Being close to things like doctors, schools, and restaurants were some key items mentioned by participants. "I think a lot of it has to do with now our generation wants things instantly and if you're hungry you can go down the street and grab some fast food; like if you were somewhere far away you'd have to make dinner, like if something happens you have to wait like if your car breaks down you would have to wait to get a part and things would take a lot longer and we're use to getting things like instantly" (E8). Another factor addressed by agricultural participants was the rising cost of land in rural areas. For example, one participant said, "out in our area, land has gotten really expensive, like a lot of our farmers and stuff are having to cut off different sections of their land and sell it to city people, because that's all that can afford it" (B5).

Participants in the agricultural group thought some images could influence people's decisions to live in rural communities, such as the first and second images presented, likely causing the most influence not to live in a rural area. Though participants thought some images might persuade people to move or not move to a rural area, they felt it really came down to a personal decision. Participants in the primarily urban group thought some images could influence people's decisions to live in rural communities. Some participants felt that photos could reinforce bad stereotypes of rural areas. Some thought the negative connotation that went along with some of the photos, for example the trailer park photo. In summary, some of the themes that emerged were consisted throughout the focus groups. The agricultural group had strong ties to the images, and for most part had stories to relate to the images. The primarily urban had a large theme of *experience by observation.* The participants related <u>grass</u>, <u>land</u>, and <u>trees</u>. The participants discussed how images could be positive and negative based on who is viewing the image. The agricultural group thought someone from an urban area would see the images as negative. The primarily urban group thought those from a rural background would be able to relate to the images.

Conclusions

The research supports the Kellogg (2001, 2002) study that indicated 75 percent of participants thought rural communities had stronger families than their city counter-parts. The *relationships/ties* theme that associated the word <u>family</u> was included in the discussion of every image. The Kellogg (2001) study also found that many consider rural Americans to be hard-workers. <u>Hard-working</u> was a key word used to describe several of the images presented. Other factors keeping people from moving to rural areas discussed in the study were <u>land prices</u>, which is also discussed in the 2002 Kellogg study. Rogers (2002) discussed a lack of health care as a reason for a decrease in rural America, as well as, a lack of facilities and amenities. The participants in this study supported these findings when they discussed a lack of <u>conveniences</u> and <u>services</u> as a factor keeping people from returning to a rural area. During the study it was mentioned by participants that for young people it was easier to date in urban areas making them leave rural America. This supports Isserman (2001) in that a lack of peers for recent college graduates is a disadvantage for rural areas.

The participants in the study reinforced the commonly thought of images for rural America found in the Kellogg (2001) study. The participants repeatedly commented on crops, landscape, greenery, and trees. It was also mentioned that the second image was rural because of the cows in the photograph. Participants seemed to think the images with a lack of green could possibly be urban. Though the HAC (2006) found that 15% of rural housing was manufactured homes, the participants in this study felt the image of a trailer home did not depict rural America. Studies completed by ERS (2008) and O'Hare and Mather (2008) found that rural areas have some of the highest poverty rates in the country. Most participants of this study felt that rural America was not <u>low-income</u>, but low-income was a stereotype placed on rural areas by urban residents. This research also supports research by McGranahan and Beale (2002) in that while participants felt that do to job opportunities, some of them would end up in a larger city; however, most would prefer to live in a rural area with some of the conveniences of living in a city.

The researcher found that while several factors such as how a person's background and lifestyle influence perceptions of rural America; media also influences participant's perceptions.

Messratis (1992) found that photographs are usually seen as copies of reality. This study helped to prove this when for some of the pictures participants expressed that the image was what came to their mind when they thought of rural America. This research supports the guiding theories and models outlined in the study.

Recommendations

While this study supports some of the perceptions of rural America and factors keeping people from moving to a rural area, both groups had some misconceptions about rural America. The agricultural participants of this study thought a non-agricultural audience would view all of the images as negative; according to the results of this study this is not true. The non-agricultural group felt someone from a rural background would be able to relate to the image, according to the results of this study was true. However, some in this group thought all people from rural areas worked on farms or in the agricultural field. Future research should be conducted with a larger number of participants, as well as, with different age groups.

Furthermore, additional research should continue to determine the impact that media photographs have on individual's perceptions of rural America. Other media outlets should be studied. It is important to look at the process of how these types of images are making it into media outlets and how we can use these outlets to correct some of the misconceptions of rural America. Also, it is important to educate the public, as well as, media outlets on the realities of rural America.

This study supports how media images influence people's perceptions. While some perceptions could be supported with facts, some perceptions of rural America were based on incomplete or inaccurate ideas and thoughts, such as; participants beliefs that rural areas did not have appliances, electrical poles, or telephone lines. Therefore, it is important for research to continue to examine the effects media play on perceptions of rural America. Researchers recommend further study of multiple media outlets to include different age groups and locations. There is also a need to compare demographics with media image impact in order to better understand how to implement changes to correct misperceptions of rural America. Furthermore, it is important to understand how images make it into media outlets and how to restrain or manage to keep negative images out of these outlets. It is recommended that education be conducted on these realities of rural America to the public and the media is vital.

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Understanding the Media Consumption Habits of College Students: A Comparison of Use Between Agricultural and Non-Agricultural Majors

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Abstract

Mass media outlets are the primary way citizens obtain information about world events. As modern society grows further away from its agricultural roots, public understanding of agricultural issues decreases, and so too does the rate of use of traditional news media sources. The uses and gratifications theory of media effects allows researchers to explore media use habits. Using survey methodology, the researchers studied the media use habits of students enrolled in a technical writing course offered in a college of agricultural and life sciences and open to students in all majors at the university. Results indicated that students in the sample were typically not high news consumers, and did not differ significantly in their news use habits based on their college affiliation except in two areas – public broadcast television use and news magazine use. The implications of this research illustrate the need for faculty in colleges of agriculture to incorporate news media in their classrooms to increase news consumption among students. Research shows that news consumption habits are connected to several factors important in future leaders.

Introduction

McQuail (2005) states that there is no doubt that mass media influence contemporary society especially in the areas of politics, culture, everyday social life and economics. According to Schudson (2003) mass media help us as a society to construct common experiences. When an item appears in the news media, it is conferred public legitimacy, providing a kind of certification of its importance. Unfortunately, as our modern society continues to move further from its agrarian roots and towards urbanization, public knowledge, attitudes and perceptions about agriculture deteriorate (Doerfert, 2003). Fewer than two percent of the American workforce is engaged in farming as an occupation (Tucker, Whaley, & Sharp, 2006) yet some of the most complex and controversial topics that appear on the mass media landscape today are connected to agriculture (Cannon & Irani, 2009; Haygood, Hagins, Akers, & Kieth, 2002; Terry & Lawver, 1995). Agriculture in the news is often cast in a negative light. Butler (2002) asserted that food safety and quality concerns are growing across the globe, and Tucker, Whaley, and Sharp (2006) note that "media coverage [of agriculturally-related issues] often focuses primarily on possible problems with the food supply as well as controversies related to human health or nutrition" (p. 137).

At the same time as the news media has a tendency to focus on less than positive agricultural news, several researchers have documented that there is an overall decline in news media consumption. The Pew Research Center for People and the Press found that the overall share of people using a news source on a daily basis fell from 90 percent in 1994, to 73 percent in 2008, and that while there is a substantial increase in the number of individuals who obtain their daily news online, there is no indication that the internet is expanding the overall news audience (Pew, 2008).

Making matters worse, the most dramatic decrease in news consumption is among the younger generations. Both the Pew Center (2008) and Putnam (2000) indicated that young people ages 18-24 are in the category of individuals who do not regularly read a newspaper or are considered "disengaged" when it comes to the news. Increasingly it seems as if younger generations are less interested in the news than their predecessors.

College students, a large part of the 18-24 year old category mentioned above, are considered important to study and understand due to their relatively new status as voters, their role as consumers, and often times early majority adopters of new technologies (Emanuel et al, 2008). Research has indicated that, specifically among college students, media consumption is associated with increased current events knowledge (Vincent & Basil, 1997). Students enrolled in colleges of agriculture who are presumably interested in careers in agriculture and the life and environmental sciences will likely be the leaders in their generation when facing the complex and daunting issues of water and land use, food safety, nutrition, and human health matters. The National Research Agenda for Agricultural Education and Communication (Osborne, n.d.) calls upon agricultural communication educators to build competitive societal knowledge and intellectual capabilities, as well as develop effect agricultural work forces for knowledge-based societies. Putnam (2000) noted a connection between media use and civic engagement which may prove problematic in turning out well-rounded, informed, media savvy and civically engaged future leaders from our country's colleges and universities. It is because of this that it is important to investigate the media use habits of students enrolled in colleges of agriculture.

Theoretical Framework

This study employed the uses and gratifications theory of mass communications, a limited effects theory which focuses on how audiences satisfy their needs and wants by using certain media (Stone, Singletary, & Richmond, 1990).

Katz, Blumler, and Curevitch (1974) described uses and gratifications as a concept concerned with an individual's selection of media, asserting that media users are goal directed in their behavior, that they are active users of media, and that they are cognizant of their needs and act in ways that satisfy those needs. Rubin (2002) provided an updated view of the theory, reorganizing Katz and colleagues' tenants, and stated that 1) communication behavior is goal-directed, purposive, and motivated, 2) individuals initiate the selection and use of different communication vehicles, 3) a number of social and psychological factors guide our communication behavior, 4) the media compete with other forms of communication, such as interpersonal interaction, for selection, attention and use, and 5) people are typically more influenced by other people than the media in this process. Rubin further explained the purpose of the uses and gratifications theory by noting that it is designed to explore how users' needs are being met by using certain types of media, to understand motives behind media behavior, and to determine the identity of functions or consequences that stem from motives, needs and behaviors of media users.

Individuals tend to form lifelong news consumption patterns during the time they begin college (Al-Obaidi, Lamb-Williams, & Mordas, 2004; Barnhurst & Wartella, 1998; Diddi & LaRose, 2006; Schlagheck, 1998). While news consumption habits of younger individuals have been historically low, evidence shows that today's college students are *increasingly* less likely than previous generations to be interested in the news, and by extension be involved in civic engagement (Delli Carpini, 2000; Jarvis, Stroud, & Gilliland, 2009, Putnam, 2000).

In a uses and gratifications study of college students, media use and current events knowledge, Vincent and Basil (1997) determined that news use increased with year in college, results similar to those found by O'Keefe and Spetnagel (1973) and Henke (1985). The researchers also found that print media use predicted current events knowledge among their participants (Vincent & Basil, 1997). However, in a similar study, Diddi and LaRose (2006) found that college students seldom sought out sources that provided in-depth coverage of events and most frequently turned to the campus newspaper, Internet portal sites, and late-night comedians as sources of news.

Additionally, Pew (2008) indicated that college aged individuals (those in the 18-24 year old category of participants) are primarily irregular news consumers (those who do not use news on a regular basis), reporting that the largest percentage of this age group fall into the "disengaged" audience category, those who generally lack interest in the news. However, the next largest segment of 18-24 year olds fall into is that of "net newsers" (19%), those who primarily use the internet to satisfy their news needs and are savvy in terms of using online tools and features to meet those needs.

Emmanuel and colleagues (2008) noted that portable communications technologies have transformed the college campus landscape in dramatic fashion. Today's college students are the Internet generation (Diddi & LaRose, 2006). While college age individuals do not generally consume news at high levels, the 18 to 25 year old age category has shown an increase in use of online sources of news and information (Pew Center, 2008).

At the beginning of the decade, Parker and Plank (2000) determined that college students had not yet adopted the Internet as a primary source of information for their needs, news or otherwise. Rather, respondents primarily used print and television sources to obtain news, weather, political and health information. However, Diddi and LaRose (2006) found that college students reported using the campus newspaper most frequently, followed by Internet portal sites, and late-night comedians for their news information.

Jarvis, Stroud, and Gilliland (2009) found, similarly to Diddi and LaRose, that students indicated they were most often got their news from the Web and comedy television programs, and least often turned to news radio and television news magazines. The researchers also determined that college students in the study reported using news that was accessible and convenient to them, infrequently consulting sources that provided a depth of coverage of national and international events.

According to the Pew Center's Biennial News Consumption Survey (2008), the percentage of individuals using traditional news sources on a given day has decreased from 85% in 1998 to

73% in 2008. Counterbalancing the scales to a degree is the increase use of online sources in obtaining news. A quarter of people surveyed reported going online for news each day, rising from only 18% in the 2006 survey (Pew, 2008). Diddi and LaRose (2006) noted that the traditional view of 'print versus television' when it comes to news sources may no longer be appropriate now that the Internet is at the top of the list of news sources used. Indeed, the Center for the Digital Future in the Annenberg School of Communication at the University of Southern California found ample support for the notion of the evolving media landscape in its annual survey. Researchers noted that a clear path toward the end of the era of print newspapers and one where online models dominate is imminent (2009).

Purpose and Objectives

The purposes of this study were to explore the media uses and gratifications of college students keeping in mind the notion that news consumption, current events knowledge and civic engagement have been documented as related concepts and are all essential to producing successful future leaders for the agricultural and natural resources sectors. Two objectives guided this study:

1. Describe the news consumption habits of students enrolled in a course offered in a college of agricultural and life sciences.
2. Determine if news consumption habits varied significantly among students enrolled in majors in the college of agricultural and life sciences compared with students enrolled in other colleges.

Methods

This study used descriptive survey research methods to address the research objectives. Data were collected with a researcher-developed instrument from a convenience sample. The target population for this study was college students enrolled in the College of Agricultural and Life Sciences at the University of Florida. A convenience sample of students from a large, technical communication, survey-type course were recruited to participate in the study and were provided an incentive for participation. The course fulfilled a portion of the university-wide writing requirement and focused on technical communication topics. Students enrolled in the course were from colleges across the university, but primarily were enrolled in majors within the College of Agricultural and Life Science. Majors within the College vary widely and include traditional agricultural fields such as animal science, horticulture, agronomy to name a few, as well as majors considered less traditionally agricultural such as human nutrition and dietetics, human development, microbiology, and others.

The researchers utilized an established media use inventory (Stone, Singletary, & Richmond, 1999) and modified it to include media technologies that were not yet popular/commonly in use at the time the original instrument was created. After developing the additional questions, the researchers enlisted a panel of experts in agricultural communications to review the instrument for content validity.

The survey instrument included 18 items and asked participants to indicate their level of use (in days and hours) of various news media outlets. Demographic items were included at the end of the instrument and included gender, age, major, year in school, and ethnicity. A Cronbach's alpha was calculated on the survey instrument and resulted in a reliability coefficient of .71.

Data were statistically analyzed using descriptive statistics including frequency counts, independent *t*-tests, means and standard deviations. The instrument was distributed to 100 participants with 88 returned containing usable data (*n*=88) for an 88 % response rate. As the survey was completed during a general administration to a convenience sample, no follow-up procedures were employed.

Results/Findings

Descriptive statistics were used to explore the demographics of participants (see Table 1). Approximately Seventy one percent of the respondents were female (n = 62) and 27.6% were male (n = 24). Participants ranged in age from 18 to 26 years: 14.9% of the respondents were between the ages of 18 and 19 (n = 13), 27.6% of participants were 20 years of age (n = 24), 27.6% were age 21 (n = 24), 14.9% indicated they were age 22 (n = 13), and 13.8% of participants indicated they were between 23 and 26 years of age (n = 12). The majority of participants, 63.2%, indicated Caucasian ethnicity (n = 55), while 11.5 percent were African American or Black (n = 10), 10.3% of participants were Hispanic (n = 9), and 10.3% were Asian American or Pacific Islander (n = 9). One individual indicated American Indian heritage, and two indicated they were of another unlisted ethnicity. Respondents also indicated their year in school, 6.9% reported being freshman (n = 6), 17.2% sophomores (n = 15), 31.0% juniors (n = 27), and 44.8% seniors (n = 39). The survey instrument asked respondents to list a major rather than select from a predetermined list. Course enrollment was open to students in any university major. From the listed majors, participants were classified as enrolled in majors in the college of agricultural and life sciences or majors in other colleges (agricultural college versus non-agricultural college major). Those enrolled in majors within the college of agricultural and life sciences comprised 72.4% of the sample (n = 63), while 23.0% were enrolled in majors in other colleges and schools at the university (n = 20), and four respondents did not indicate major affiliation.

Table 1
Participant Demographics

	n	Percent (%)
Gender:		
Female	62	71.3
Male	24	27.6
Age:		
18 to 19 years	13	14.9
20 years	24	27.6
21 years	24	27.6
22 years	13	14.9
23 to 26 years	12	13.8

Table 1 (continued)

	n	Percent (%)
Ethnicity:		
Caucasian/White	55	63.2
African American/Black	10	11.5
Hispanic	9	10.3
Asian American/Pacific Islander	9	10.3
American Indian	1	1.1
Undeclared	2	2.3
Year in school:		
Freshman	6	6.9
Sophomores	15	17.2
Juniors	27	31.0
Seniors	39	44.8
College affiliation:		
College of Agricultural and Life Sciences	63	72.4
Other College	20	23.0
Undeclared	4	4.6

Objective 1

The media use inventory instrument was used to measure the types of sources and length of time participants spent using each source during a given week. Respondents were first asked to indicate approximately how many days in a week they used specific media sources (see Table 2). Respondents spent the most time using print newspapers as a media source (*M* = 2.9, *S.D.* = 1.94). Respondents spent the least amount of time viewing public television broadcasting news (*M* = .52, *S.D.* = 1.03).

Table 2
Number of days in a typical week respondents use each media source

Media source	Days each week (Mean)	SD
Print newspapers	2.9	1.94
Online version of print newspapers	2.4	2.41
Cable TV News (CNN, FOX News, MSNBC)	2.3	2.22
Network television news (ABC, CBS, NBC)	2.2	1.95
Radio (commercial, satellite, public radio, etc.)	1.8	1.95
Online Network or Cable News	1.2	1.79
News magazines (such as Newsweek, Time, U.S. News & World Report, Business Week, etc.)	.64	1.20
Online version of news magazines	.75	1.45
Public Television Broadcasting News	.52	1.03

Frequency counts were then used to determine the hours in a typical day respondents spent using a specific media source (see Table 3). Less than 5% of all respondents used a specific media source more than four hours each day. Public television and news magazines were used the least, with 72.4% reporting spending no time watching public television and 64.4% reporting they do not spend any time reading news magazines.

Table 3
Hours Per Day Participants Report Using Media Sources

Media source	Number of hours per day (%)				
	None	Less than 1 hour	1-3 hours	4-6 hours	More than 6 hours
Print newspapers	16.1	65.5	17.2	0	1.1
Online version of print newspapers	28.7	50.6	19.5	0	1.1
Network television news (ABC, CBS, NBC)	21.8	47.1	28.7	2.3	0
Cable TV News (CNN, FOX News, MSNBC)	26.4	48.3	23	2.3	0
Public Television Broadcasting News	72.4	20.7	5.7	1.1	0
Online Network or Cable News	50.6	37.9	11.5	0	0
News magazines (such as Newsweek, Time, U.S. News & World Report, Business Week, etc.)	64.4	27.6	8.0	0	0
Online version of news magazines	63.9	31.0	4.6	0	1.1
Radio (commercial, satellite, public radio, etc.)	39.1	44.8	12.6	2.3	1.1

Objective 2

Independent-samples t-tests were conducted to compare the media use habits of students with majors in the college of agricultural and life sciences with those enrolled in majors in other colleges at the university. There was a significant difference in scores for two media sources, one in days per week of use (see Table 4) and the other in hours per day of use (see Table 5). Students in the college of agricultural and life sciences spent significantly fewer days in the week watching public broadcasting television than students in other colleges. Additionally, students in majors in the college of agricultural and life sciences spent significantly fewer hours reading news magazines than students in majors in other colleges.

Table 4
Independent t test Comparing Typical Weekly Media Use by College Affiliation (days per week)

	t	*p*
Print newspapers	-.691	.492
Online newspapers	-.277	.738
Network television news (ABC, CBS, NBC)	-1.33	.187
Cable television news (such as CNN, Fox News, MSNBC)	.007	.994
Public broadcasting television (PBS)	-2.84	.006**
Online version of network or cable news	-1.64	.103
News magazines (such as Newsweek, Time, U.S. News & World Report, etc.)	-1.75	.085
Online version of news magazines	-.657	.513
Radio (commercial, satellite or public radio)	-.168	.867

Note**: p <.01

Table 5
Independent t test Comparing Typical Daily Media Use by College Affiliation (hours per day)

	t	*p*
Print newspapers	.078	.938
Online newspapers	-.904	.369
Network television news (ABC, CBS, NBC)	-.369	.713
Cable television news (such as CNN, Fox News, MSNBC)	.742	.460
Public broadcasting television (PBS)	-1.793	.077
Online version of network or cable news	-1.761	.082
News magazines (such as Newsweek, Time, U.S. News & World Report, etc.)	-2.707	.008**
Online version of news magazines	-1.597	.114
Radio (commercial, satellite or public radio)	-.569	.571

Note**: p <.01

Conclusions

Overall, college student respondents in this study do not appear to be heavy media users. The participants reported using print newspapers most frequently, almost three days per week. However, on the whole, respondents spent less than an hour with newspapers they did read, both online and in print.

The second most frequently used news source in terms of days per week was online newspapers at slightly fewer than two and a half days per week. Least often used is public broadcast television at less than half a day per week, followed closely by news magazines and online versions of news magazines.

Only one individual in each category reported using more than 6 hours of print newspapers, online newspapers, online weekly news magazines, and radio per day. The majority of respondents reported less than one hour of use per day of each of the sources listed. The overwhelming evidence from this study is that the majority of respondents spend less than one hour per day with the news media that they do use, regardless of which source is used.

Respondents enrolled in majors in the college of agricultural and life sciences watched significantly less public broadcast television than students in other colleges. Additionally, students in the college of agricultural and life sciences spent fewer hours each day utilizing news magazines for news.

Discussion and Implications

Several researchers have noted the decline in traditional media use over the past decades (Delli Carpini, 2000; Jarvis, Stroud, & Gilliland, 2006; Pew, 2008; Putnam, 2000). Despite this evidence, respondents in this study reported using print newspapers as their most frequent source for news information. In their study of college student media use, Parker and Plank (2000) pointed out that college students often have different news and information needs than members of the general public.

Students in the present study reported using print newspapers most frequently of all media sources listed, which seems unusual given the well-documented decline of print journalism. One potential contributing factor to the high reported use of print newspapers is the popularity of the campus newspaper, which provides students a spectrum of information about life on campus, but often is unable to cover major world and national news events. Impt to recog that this was a stratified convenience sample and approx 50% (check) of particips were college of ag, which may skew the results.

The low level of use of public broadcast television for news among this sample is no surprise due to the differing demographics of this study and the typical public broadcasting viewer or listener who generally tend to be over 50 years of age, male, and predominantly white (Aufderheide, 1997; McCauley, 2002). However, the difference in use of public broadcast television between college of agricultural and life sciences majors and students in other colleges is interesting to note. One possible explanation might be that the programming offered on public broadcasting is of more interest to students studying subjects such as marketing, business, and various health professions due to its focus on politics, economic, and financial issues than to students in colleges of agriculture.

While the slightly less frequent use of online newspapers illustrates their popularity among this sample of college students, it is interesting to note that the reported dramatic rise in use of online news sources is not reflected in this study. Potentially this is due to the fact that the survey instrument asked specifically about participants' use of online newspapers rather than the use of online news sources in general.

In considering why students in non-agricultural colleges spent more time with news magazines than their agricultural major counterparts, it is possible that students in other colleges are again more interested in the content that news magazines have to offer, which is predominantly business, economic, financial, and political information, and these topics are seen by the students as more relevant to their majors.

Regardless of which college they are enrolled in, students who participated in this study are generally low news consumers. This is a concern as researchers have noted that consuming news media contributes to the formation of strong civic habits in the late teens and early twenties (Delli Carpini, 2000) and "has important implications in the creation of an informed electorate in areas including politics and international events" (Vincent & Basil, 1997, p. 381).

Recommendations

In order to grow future leaders in agricultural and natural resources, it is imperative that colleges of agriculture make efforts to increase the news consumption habits of their students. While this may seem like a daunting task, faculty can work to incorporate increased use of news media in their classrooms using a variety of technology options frequently found on college campuses. For instance, one option is to utilize wireless internet access and have students access online news stories or postings about the topic of a day's lecture. Instructors wary of technology or unable to access the internet from their classrooms can do something as simple as bringing in copies of the local daily newspaper and challenging students to find an example of the lecture topic in the pages of the broadsheet in front of them.

Further research should be conducted into some of the reasons that students may provide justifying their low level consumption of news media. Researchers must ask the important questions of students to determine whether they are uninterested in the news or if they believe it is not relevant or interesting to them or their career paths and begin to make strides towards making news consumption part of the college education experience.

Additionally, as research has indicated, the line between news media and entertainment news has been blurred in recent years (Putnam, 2000). Focus groups of college students may be helpful to explore what topics and subjects college students consider news, how they define the concept of news, and specifically what kinds of online sources they access to obtain their news and information.

Finally, an exploration into the potential habitual use of news and information sources by college students may be helpful. Diddi and LaRose (2006) indicated that "with repetition, media behaviors become less subject to active self-observation" (p. 196). It is possible that media use, whether in the pursuit of news or other information becomes habitual and students do not distinguish between news and entertainment.

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An Integrated Approach to Teach Communication Skills Using Educational Technologies

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Abstract

The purpose of this descriptive research study was to measure agricultural education students' knowledge, skills, and perceptions towards using integrated educational technologies in the classroom. The population was 17 agricultural education students enrolled in an agricultural communications course over a two-year period. A new multimedia content development resource that allows students to build museum-style touchscreen exhibits via a collaborative web-based system was integrated into the course. Pretest and posttest evaluations showed 6% to 57% changes in knowledge and skills as a result of the digital exhibit capstone project. The most significant changes were seen in storyboarding, multimedia project development, and graphic design principles, indicating that students require additional education in these areas. The lowest percentage changes were seen in the same three competencies each year, revealing that students were most comfortable with interviewing, technical writing, and giving public presentations. The findings suggest that students gained the most knowledge in technology development, integration and application, rather than interpersonal skill building. This integrated course provides an idea of how educators can design courses that not only increase students' communications knowledge and skills, but also gain realistic experiences by creating their own multimedia content for public communication.

Introduction, Literature Review, and Conceptual Framework

Technology is changing the face of traditional and online instruction at colleges and universities (Lowerison et al., 2006). George (2000) stated, "Technology can play a vital role in helping students meet higher standards and perform at increased levels by promoting alternative, innovative approaches to teaching and learning" (p. 57). The U.S. Department of Education (2009) reported an increasing amount of evidence related to the beneficial opportunities of using technology to improve education. This meta-analysis study found that "blended" instruction of using online and face-to-face elements was more effective on student achievement over face-to-face instruction alone. The report further stated that instructors need to incorporate digital content into everyday classes to increase teaching effectiveness (U.S. Department of Education, 2009).

Allen and Seaman (2008) reported that over two-thirds of higher education institutions now offer online courses and programs to remain competitive and fill student needs. As a result of these changes, more faculty are taking advantage of new techniques and opportunities to incorporate technology into all courses and deliver information in a new way (Ertmer, 2005). The Chronicle of Higher Education (2007) challenged educators to utilize a variety of teaching and learning resources, especially technology, to reach a new generation of "millennial" students. Educators must engage students in an education that properly prepares them for a future career that will more than likely involve working with online and emerging technologies.

Today, 98.4% of college students now own a personal computer (Salaway, Caruso, & Nelson, 2007). There is a growing body of research that promotes the integration of technology into agricultural college courses. Alston and Warren (2007) specifically stated the importance of using more web-enhanced instruction and technology assignments in agricultural education courses to better prepare future agricultural leaders. Rhoades, Friedel, and Irani (2008) found that there is a need for educators to continue to monitor how agricultural students and their instructors adopt and use new technologies. Jones, Johnson-Yale, Millermaier, and Perez (2009) found that 94% of college students spend considerably more time online, at least one hour each day, than Internet users in the general population. Students in the study reported high rates of online social activity, use of Web 2.0 tools, and view technology as part of college life. Jones and Madden (2002) found that 68% of college students studied used the Internet and new technologies to gain more in-depth information in their field of study. Kotrlik et al. (2003) found that agricultural education teachers spend the majority of their effort on exploring and adopting the use of teaching technologies, but are not as actively involved in the integration of these technologies into the classroom. Factors of inexperience with technologies, teaching effectiveness, and anxiety tend to be barriers to this integration. However, educators must recognize this widespread use of technologies by students and discover new teaching techniques to engage them in building their professional skills using familiar media. Infusion of these new technologies into agricultural courses will not only assist current students in refining a variety of communication skills, but can also attract potential students looking for educational programs that teach current technologies (Rhoades, Friedel, & Irani, 2008). Furthermore, multimedia has the potential to create high-quality learning environments. Research suggests that using technology and multimedia tools to teach science content can enhance student learning outcomes (Roschelle et al., 2000). The key elements of multiple media, user control over the delivery of information, and interactivity can be used to improve the learning process resulting from integrated learning environments (Cairncross & Mannion, 2001).

The Kotrlik-Redmann Technology Integration Model © (Kotrlik & Redmann, 2002) provided a conceptual framework for this study. The model was developed based on theories and research concerning the integration of technologies into teaching and learning. This model discusses four distinct and independent phases of technology integration: Exploration, Experimentation, Adoption, and Advanced Integration. The Exploration phase involves teachers seeking information about technologies and how to use them; the Experimentation phase focuses on teachers beginning to utilize technologies in classroom instruction; the Adoption phase reveals evident physical changes in the classroom with technology as a focal point of teaching and learning; and the Advanced Integration phase centers on instructors who actively pursue innovative ways to use technology to enhance teaching and learning beyond traditional activities. Additional research is needed to explore new ways for teachers to integrate technologies into the classroom setting and move through each of these phases. As research suggests (Kotrlik et al., 2002), the more confident and experienced teachers feel about using technologies, the more these technologies will be integrated into new ways of teaching and learning.

As a result of the increasing emphasis on technology integration into educational settings, the Burns Technology Center (BTC) at Montana State University (MSU) began to envision how to create a more innovative campus learning environment. The goal was to create a technologically advanced environment that emphasizes teaching, learning, and collaborative educational technologies. The vision, which started with just a plasma screen showing static images of projects, expanded into a dynamic public hub where students, faculty and visitors could not only gather to experiment with educational technologies, but also participate in multimedia content development. The vision was further transformed by campus input: Focus groups of potential users stressed the need for technology that was engaging and interactive, capable for use by large and small groups, and inclusive for the entire campus. The BTC addressed this need for technology by proposing a dynamic multimedia system which could evolve over time and grow with users' abilities and interests.

The resulting multimedia center, Studio 1080, was fully opened on campus in 2008. This technology allows students to develop their own storytelling and technology skills while creating digital exhibits that are visible to the world. The center continues to grow and expand continuously, with the majority of new projects originating from university students. As such, Studio 1080 can be viewed as an "organic museum." While the display technology rivals that of a modern science center, including three 65-inch plasma touch-screens, HD projection system, and surround sound, all "exhibits" are produced by students and staff. Using specialized software developed originally for museums, users build touch-screen exhibits featuring video, images, text, slide shows and animations. Content is organized and uploaded via the web; then Studio 1080 visitors can access all digital exhibits on-site. The goal of the Studio is to utilize technology to share the breadth of university teaching, research and extension creativity with the world, and to directly involve students in that process.

This new resource at the MSU takes multimedia content development to a new level, allowing students to use technologies to build digital exhibits via a collaborative web-based system. This resource has been integrated into an agricultural communications course to educate students on how to apply these skills into a digital storytelling and educational context. The goal of the course was not only to engage students in learning a variety of technical skills, but to provide them with the opportunity to use rich media technologies through digital storytelling to showcase course capstone projects. The Studio offered a unique multimedia complex and venue for students to publicize their accomplishments and share ideas through the creation of a touch-screen exhibit. Development of a research-based agricultural education module within the course allowed students to conduct research, design educational content, utilize multimedia software, integrate technologies, and build digital exhibits that were then presented to the public. Use of this integrated teaching approach inspired students to apply agricultural communication skills, including written, oral, digital media, and research, in a new way. The digital exhibits remain in Studio 1080 beyond the completion of the course. This study addressed the National Research Agenda, Research Priority Area 4 in Agricultural Communications- “Develop effective agricultural work forces for knowledge-based societies”.

Purpose and Objectives

The purpose of this descriptive research study was to measure agricultural education students’ knowledge and perceptions of using integrated educational technologies in the classroom. The objectives of this study were: (1) To identify agricultural education students’ changes in knowledge and skills using educational technologies in an entry-level agricultural communications course, and (2) To identify agricultural education students’ perceptions of the use and application of educational technologies in an entry-level agricultural communications course.

Methods and Procedures

The study design utilized a single group pretest/posttest design of non-randomized students enrolled in an upper division, entry-level agricultural communications course over a two-year period. Two separate classes participated in the research study in fall 2008 and 2009. Groups were assessed for equivalence before the treatment based on the similar characteristics- all participants were agricultural education juniors or seniors and this was their first agricultural communications course (Leedy & Omrod, 2010). The independent variable was the instructional methods, while the dependent variable was the change in knowledge, skills, and perceptions towards using integrated educational technologies. The treatment was the capstone project assignments and there was no control group. It must be noted that caution must be used in drawing conclusions because there was no comparison group and there may be other confounding variables accounting for changes, such as other courses. However, the use of single group pretest/posttest designs can be supported if situational factors are taken into account and in this case, all students were exposed to the same coursework and took an identical pretest and posttest during the enrolled semester (Eckert, 2000).

The population was 17 agricultural education students who were enrolled in an upper division, entry-level agricultural communications course over a two-year period (N=17, n=8 in year 1 and n=9 in year 2). The response rate was 100%. Student content knowledge was determined using a researcher developed content knowledge achievement pretest and posttest instrument. To address construct validity, the 17-item instrument was developed from a review of literature regarding integration of technologies into courses and foundational agricultural communication competencies (Akers, Vaughn, & Lockaby, 2001). Content and face validity of the instrument were determined by a panel of agricultural university faculty (Ary, Jacobs, & Razavieh, 2002). A pilot test with 10 agricultural education upper division undergraduate students not in the study was conducted and a Cronbach's alpha was calculated on the instrument and revealed a reliability coefficient of 0.72. SPSS 18 software package was used in analyzing the data. Descriptive statistics, including means, standard deviations, and percentages were calculated.

Course Format, Content, and Projects
This course offered an overview of communications strategies important in the agricultural industry. Focus was placed on developing basic competencies in the areas of public relations, technical writing, qualitative research, video production, photography, storyboarding, scriptwriting, and graphic design. Various educational technology skills were emphasized in different assignments throughout the course and then compiled in the capstone project: a 24-screen interactive multimedia exhibit available to the public in the BTC Studio 1080 multimedia center.

Throughout the semester, students were required to complete a variety of assignments that develop communication skills and also directly related to their final multimedia capstone project. Assignments were focused on developing educational materials, communications skills, and technical competencies to be integrated into the Studio 1080 content module. Specific objectives related to the final capstone project are outlined below.

Capstone Project Objectives

- Write a detailed proposal of your research project
- Create a storyboard for multimedia content module
- Conduct an informative interview with professionals/experts on your research topic
- Create a photo portfolio for your content module
- Practice shooting and editing videos to create an inclusive two-minute video to be used in the content module
- Develop a comprehensive 24-screen educational research-based digital exhibit using the web-based Studio 1080 software
- Present your Studio 1080 exhibit to the class and public

Description of Capstone Project

In groups, students used the BTC Studio 1080 software to create a research-based touch-screen exhibit that communicates agriculture, helps solve a "real-world" agricultural problem, teaches an agricultural education lesson, highlights agricultural research, or promotes an agricultural education program. The project was selected in consultation with the instructor, and grades were determined not only by the quality of the final project, but also by the effort each person contributed to the final project. The final project was submitted in stages throughout the semester.

The final digital exhibit must effectively communicate agricultural research or education for a public audience. The module was uploaded to the BTC Studio 1080 multimedia center for public viewing. Each group created a 24-screen exhibit using information from course assignments including: an interview with an expert, a video, photographs, and educational content based on primary and secondary research. The module also included at least two of the following components: a map, graphics, music/audio clip, an interactive quiz, or a slideshow of pictures.

Results/Findings

It is thought that many of today's students are familiar with using modern online multimedia tools for personal use. However, few students in agricultural education have the opportunity to experiment with professional quality multimedia development software that directly incorporates these tools into coursework. Course assignments were designed to teach the students not only about technologies, but allowed them to develop their own touch-screen educational module through integration of these technologies.

The capstone project was graded on the professional quality of each media asset produced, as well as on the overall presentation and how well the module communicates and publicizes the agricultural information. Primary and secondary research was required to obtain factual, current information. The final module was evaluated by peers, the instructor, and Studio1080 directors. As a result of this course and capstone project, students learned to improve technical skills and how to integrate technologies that can be used to showcase communications work. Students also gained networking contacts in the agricultural field and a better understanding of careers in agricultural communications from the research conducted.

Objective 1: To identify agricultural education students' changes in knowledge and skills using educational technologies in an entry-level agricultural communications course

A pretest and posttest evaluation instrument was given to all students regarding course competencies. Knowledge and skills in the following areas were self-evaluated: agricultural education research, interviewing, news writing, photography, multimedia project development, photo editing, video production, graphic design, technical writing, public presentations, poster development and design, storyboarding, and research methods. Mean scores, standard deviations, percentages changes for each year are presented in Tables 1 and 2. All evaluation scores were based on a five-point scale with 1=No Knowledge, 2=Little Knowledge, 3=Moderate Knowledge, 4=Knowledgeable, 5=Very Knowledgeable.

In year one, students' pretest scores ranged from M=1.50 to M=3.63 in all competency areas. Posttest scores ranged from M=3.50 to M=4.50. Percentage changes from pretest to posttest ranged from 6% to 57%. Highest knowledge increases were in the following areas: storyboarding (+2.0, +57%), graphic design principles (+1.62, +46%), video production (+1.50, +43%), multimedia project development (+1.62, +36%), and poster development and design (+1.50, +36%). Lowest changes in mean scores were in the following areas: public presentations (+0.87, +19%), interviewing skills (+0.62, +15%), and technical writing skills (+.25, +6%). In year two, students' pretest scores ranged from M=2.11 to M=3.67 in all competency areas. Posttest scores ranged from M=3.56 to M=4.22. Percentage changes from pretest to posttest ranged from 8% to 41%. Highest knowledge increases were in the following areas: press release writing (+1.45, +41%), research methods (+1.33, +39%), storyboarding (+1.34, +38%), graphic design principles (+1.45, +38%), and multimedia project development (+1.44, +34%). Lowest changes in mean scores were in public presentations (+1.10, +24%), interviewing skills (+1.0, +25%), and technical writing (+.48, +12%).

Table 1
Change in students' competencies from pre to post test course evaluations: Year 1 (n=8)

Competency	Pre-test *M(SD)*	Post-test *M(SD)*	Change (%)
Storyboarding	1.50(0.76)	3.50(0.53)	57
Graphic Design	1.88(0.84)	3.50(0.93)	46
Video Production	2.00(1.31)	3.50(0.53)	43
Multimedia Project Development	2.88(1.25)	4.50(0.53)	36
Poster Development and Design	2.63(1.06)	4.13(0.64)	36
Feature Story Writing	2.88(1.00)	4.25(0.71)	32
Research Methods	2.63(1.06)	3.63(0.92)	31
Press Release Writing	2.75(1.04)	4.00(0.76)	31

Photography	3.13(0.84)	4.25(0.89)	26
Photo Editing	3.00(1.07)	4.25(0.46)	29
Awareness of Ag Ed Research	3.13(0.83)	4.25(0.71)	26
Public Presentations	3.63(0.92)	4.50(0.53)	19
Interviewing Skills	3.38(0.52)	4.00(0.53)	15
Technical Writing	3.63(0.74)	3.88(0.83)	6

Note: Likert Scale 1=No Knowledge, 2=Little Knowledge, 3=Moderate Knowledge, 4=Knowledgeable, 5=Very Knowledgeable

Table 2
Change in students' competencies from pre to post test course evaluations: Year 2 (n=9)

Competency	Pre-test *M(SD)*	Post-test M(SD)	Change (%)
Press Release Writing	2.11(1.36)	3.56(1.41)	41
Research Methods	2.11(0.78)	3.44(1.01)	39
Storyboarding	2.22(1.30)	3.56(1.01)	38
Graphic Design	2.33(1.41)	3.78(0.97)	38
Multimedia Project Development	2.78(1.10)	4.22(1.09)	34
Feature Story Writing	2.33(0.87)	3.44(1.41)	32
Photography	2.89(1.05)	4.22(0.67)	32
Video Production	2.89(1.17)	3.78(0.97)	24
Poster Development and Design	2.56(1.13)	3.67(0.87)	30
Photo Editing	3.22(0.97)	3.67(0.87)	12
Technical Writing	2.78(0.67)	3.56(0.88)	22
Interviewing Skills	3.11(0.60)	3.78(1.89)	18
Awareness of Ag Ed Research	3.00(0.60)	3.56(1.71)	16
Public Presentations	3.67(1.12)	4.00(1.00)	8

Note: Likert Scale 1=No Knowledge, 2=Little Knowledge, 3=Moderate Knowledge, 4=Knowledgeable, 5=Very Knowledgeable

Objective 2: To identify agricultural education students' perceptions of the use and application of educational technologies in an entry-level agricultural communications course

A post-evaluation questionnaire was also completed by each student related specifically to the capstone project and application of technologies. Questions included training needs, program difficulties, applications of the system, required technological skills, user challenges, compatible external software and programs, communication strategies, the importance of technology, and future recommendations. All 17 participants (100%) completed the instrument. Difficulties encountered were sizing photos, software restrictions, file format conversions, applying graphic design principles, multimedia software problems, convergence of media, uploading media and materials to the program database, and limitation of web templates. Students learned to work with software programs such as Photoshop, iMovie, iPhoto, Google Picassa, PowerPoint, a Scrapbook program, Microsoft Paint, Microsoft Works, Windows Movie Maker, and Audacity to complete the project. Specific communication and technology skills learned included photo editing, interviewing, video production, audio recording, design principles, graphics creation, summarizing and organizing information, storyboarding, file conversions, and creative ways to communicate information.

The following quotes revealed the perceptions of students about the importance of multimedia technologies in agriculture.

"In an ever growing age of technology, it is important to stay current with new technology programs,"

"To make us more well-rounded professionals and help us communicate agriculture to the general public in various ways,"

"This is the direction that technology is taking and it is important for us to be prepared to use it,"

"There is a lot of agricultural information to showcase and this a good way to reach larger audiences,"

"It is the future,"

"We always say we want to communicate agriculture better and we have to be technology savvy to accomplish this. It enables us to reach more people and bigger audiences,"

"Because as agriculture becomes more technologically advanced, this is a good way to understand and learn about those advancements."

Studio 1080 staff reported that, throughout the digital exhibit development process, the agricultural education students asked thoughtful, relevant questions related to both the technology tools and the process of organizing content in a non-linear (user-driven) setting; and ultimately discovered new and innovative ways to push the boundaries of the Studio 1080 technology. Students presented their work on the touch-screens in a professional and well-organized manner, and their exhibits remain on permanent display for the public. As a result of integrating assignments with a capstone project, students increased communications knowledge, while also gaining realistic experience through the application of skills to a specific multimedia program.

Conclusions, Implications, and Recommendations

Many college students embrace the value of multimedia and user-generated content (Cotton & Jelenewicz, 2006), but the visual appeal and public access of Studio 1080 has escalated interest in using new educational technologies within the classroom. This course has initiated inter-disciplinary projects and sparked discussions of the significant role of technology in higher education classrooms. The studio not only gives students the opportunity to contribute their own work to a high-tech creative collaboration, but also enables educators to include key elements of an integrated learning environment into courses (Cairncross & Mannion, 2001). Although college students are accustomed to sharing their work through websites like YouTube and Flickr, the studio allows them to combine video, text, images and animations into richer non-linear presentations, much like those found in a museum or science center

As reported in the qualitative perception statements, students understand the value of learning new technologies and want to be prepared for future careers. These findings specifically reflect Alston and Warren's (2007) research of the importance of using more web-enhanced instruction and technology assignments to better prepare future agricultural leaders. Using an integrated approach to teach specific skills and then having students apply these to a capstone project can significantly enhance learning outcomes. The most significant changes in mean knowledge scores during both years were seen in storyboarding, multimedia project development, and graphic design principles, which indicates that students need more education in these communication competencies. The lowest percentage changes in mean knowledge scores were seen in the same three competencies each year revealing that students were most comfortable with interviewing, technical writing, and giving public presentations. The findings indicate that agricultural education students exhibit more confidence and have more content knowledge in these competency areas. Specifically, these results confirm that agricultural education students perceive that they are being effectively prepared in knowledge, skills, and attitudes essential to teaching. Findings from this study also revealed that more focus should be placed on technology development, integration and application in this course, rather than interpersonal skill building. Instructors should continually survey students in order to determine the emphasis of teaching material, assignments, and student needs.

Integrated course assignments allowed students to use new technologies and software programs, as well as experiment with innovative multimedia development systems. Students not only learned to produce educational research-based content, but to do it in a way that encouraged critical and creative thinking. Students learned to incorporate various media into a non-linear module that communicates agricultural information to the public in an enticing way. This project also allowed students to capitalize on their strengths and interests in using multimedia tools within an exciting learning atmosphere.

The students' work has become part of a permanent digital exhibit that is available to the general public, thus contributing to the university's outreach mission. Because the students' exhibits are permanently located in a public multimedia center, their work has more reach than a traditional capstone course project. The projects have been viewed by visiting high school students during the State FFA Convention and 4-H Congress; by Chamber of Commerce groups and international delegations; and by faculty as an example of how they, too, can incorporate technology into the classroom. Studio 1080 and its student-produced digital content has become an integral component of the orientation program and campus tours for prospective students. In this regard, the students' work goes beyond their classroom learning and helps to fulfill a community outreach mission.

This study revealed one way that educational technologies can be integrated into courses, but supports the continual need for research on the adoption and use of new technologies in the classroom (Rhoades, Friedel, & Irani, 2008). Although this technology studio is available to all instructors on the MSU campus, the agricultural communications course is one of only three courses currently using the resource. As Kotrlik et al. (2002) stated, one possible reason for this is due to the lack of confidence and experience that teachers have with integrating technologies into teaching and learning. Therefore, more emphasis on professional development of faculty on the use of educational technologies can help them to move through the four stages of the The Kotrlik-Redmann Technology Integration Model © (Kotrlik & Redmann, 2002) more effectively.

Although the small sample size was a limitation to the study and that all campuses do not have access to a multimedia development software package and high-tech facility such as Studio 1080, the idea of integrating new educational technologies into comprehensive course projects can significantly enhance student learning as seen in this study and reported by Roschelle et al. (2000). Educators must utilize modern technological applications and innovative teaching techniques that allow for the application of skills. Teaching students using the media with which they are already comfortable will improve gains in learning and stimulate interest in the subject matter. There is an increasing student demand for teachers to utilize these new technologies; therefore, educators must respond to this call and seek original ways of teaching the material and incorporating student-produced multimedia into courses.

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A Qualitative Analysis of the History of E-Extension (eXtension) and the Implementation of Moodle™ (A Learning Management System)

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Abstract

The Extension System has been educating the nation for over 93 years, and the idea of using technology as a medium for education has been in the minds of Extension Educators for over 40 years (Tennessen, PonTell, Romine & Motheral, 1997). The National eXtension Initiative is being adopted at a rapid pace and the history of this impact requires documentation in order to assist others in similar adoption and diffusion processes. The purpose of this historical study was to describe how and why eXtension was established and the implementation of Moodle™ as a learning management system (LMS) within eXtension. Interviews were conducted with five influential individuals concerning their experiences throughout the development of the eXtension system and how Moodle™ became the LMS of choice. The researchers were able to determine that the eXtension system is becoming an accepted form of education for Extension; however, barriers to adoption do exist. The study revealed that online education is becoming part of Extension through eXtension, but as awareness grows and develops the eXtension system must do the same.

Introduction & Theoretical Framework

Computer technologies are impacting all facets of agriculture, and Extension is no exception. Documentation of the history of eXtension and the adoption of Moodle™ (A Learning Management System) by Extension Educators nationally provides an opportunity for others to learn from the process. The implementation of Moodle™ as a Learning Management System for use throughout eXtension began a new innovation-decision process among Extension communities. However, Rogers (2003) stated that, "For certain innovators, diffusion via the Internet greatly speeds up an innovation's rate of adoption" (p. 216). The diffusion of innovations theory can be applied to the adoption of Moodle™ as an online educational delivery system, and it is important to document the process in order to preserve history and provide guidance for the future. The theoretical framework for this study is based on the diffusion of innovations. According to Rogers, "The innovation-decision process is the process through which an individual (or other decision making unit) passes from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision" (Rogers, 2003, p. 216). Rogers (2003) stated, "*Diffusion* is the process in which an innovation is communicated through certain channels over time among members of a social system" (p. 5).

Rogers defines a virtual organization as "a network of geographically-distant employees who are linked by electronic communication…[the] employees may have occasional face-to-face meetings, but most of their daily work is carried out at a distance" (Rogers, 2003, p. 405). eXtension is a virtual organization. As shared on the eXtension.org website (2009), eXtension is an, "…interactive learning environment delivering… knowledge from the smartest land-grant university minds across America… [and it] connects knowledge consumers with knowledge providers." Harder and Lindner (2008) reported that, "…eXtension could be the key to increasing the relevance of Extension for future generations of clientele" ("Introduction," para. 3). The adoption of a Learning Management System could impact that relevance.

According to Waterhouse (2005), Learning Management Systems like WebCT™, Lotus LearningSpace™, and Web Course in a Box™ became popular in the early to mid 1990s. Blackboard™ joined a few years later and quickly became a favorite because of its user-friendly format (Waterhouse, 2005). However, one of the fastest growing course management systems available today is Moodle™. The Moodle™ Learning Management System has, "…become very popular among educators around the world as a tool for creating online dynamic websites for their students" ("moodle.org," 2009).

According to Murphrey and Coppernoll (2006), "The evolution of technology is bringing about new ways to collaborate and communicate….However, implementing and gaining acceptance of this technology requires purposeful and planned efforts" ("Conclusions", para. 1). In order to increase the use of distance education by Extension, it is valuable to look at the process by which leaders influence selection and implementation. Northouse (2007) defined leadership as, "…a process whereby an individual influences a group of individuals to achieve a common goal" (p. 3). Kotter (1996) stated that, "Leadership defines what the future should look like, aligns people with that vision, and inspires them to make it happen despite the obstacles" (p. 25). These leaders can often be referred to as change agents. Rogers (2003) stated that, "One main role of the change agent is to facilitate the flow of innovations from a change agency to an audience of clients. For this type of communication to be effective, the innovations must be selected to match clients' needs" (p. 368).

Extension has been educating people for over 93 years, and throughout that time, different approaches to education have been addressed in order to make learning available to more people. In an article by Medved in one of the first *Journal of Extension* issues in 1966, the topic of distance education was addressed. Medved (1966) stated that, "Television's rapid development since 1948 has stimulated wide-spread interest in the use of this medium as a teaching tool" (p. 28). Medved also addressed the fact that the potential of using television as a learning tool through Extension had not been fully realized.

According to Holmes and Gardner (2006), online learning is generally believed to be a relatively new tool; however, it is an *idea* that stems from the early 1920s. While computers and the World Wide Web were not in existence at this time, the dream of a machine that could teach was in the minds of many (Holmes & Gardner, 2006). The concept of technology and eLearning has, "…acted to open up the world of knowledge to everyone and its most powerful variant, online e-Learning, has become a catalyst that has enabled huge changes in what is learned and who is able to learn it" (p. 51).

Technology continues to change daily and is reshaping the people who utilize technology as well as other technologies being developed (McLuhan as cited in Weller, 2007). These technological advancements have led to several different forms of online learning. According to Williamson and Smoak (2005), technology is "…revolutionizing the way we learn, entertain ourselves, communicate, do our jobs, and much more" ("Introduction", para. 1). Online learning is one of the fastest growing ways to learn. Distance learners find eLearning appealing because it allows them, "…the flexibility to take courses that are not bound by time or place" (Dooley, Lindner & Dooley, 2005, p. 3). Online learning is being utilized in many different ways by many different groups and individuals, such as, "…universities, community colleges, K-12 schools, businesses, and even individual instructors" because almost any type of educational content can be accommodated through an online learning approach (Cole & Foster, 2008, p. 1).

In 1997 Tennessen, PonTell, Romine and Motheral stated that,

> The information age is supporting technologies, such as the Internet and other digital tools, [that have] enabled work and learning to occur during time periods and locations based upon individual needs…the Internet is now considered a mass media. Individuals may soon consider such electronic connectivity as essential to daily living….Communities recognizing and adapting to these changing needs will be competitive in the information age. ("Introduction", para. 1 & 2).

In today's world the concept of eLearning has become a necessity and is a continuing development for the future and as such there are many different Course Management Systems (CMS), Virtual Learning Environments (VLE), and Learning Management Systems (LMS) that have been developed (Holmes & Gardner, 2007; Weller, 2007). These terms are often used interchangeably. However, one of the fastest growing Learning Management Systems available today is Moodle™.

Moodle™ has two different meanings, the first being an acronym standing for "Modular Object-Oriented Dynamic Learning Environment" (Cole & Foster, 2008, p. ix). The second meaning is the literal term for Moodle™, "…a verb that describes the process of lazily meandering through something… as it occurs you do them, an enjoyable tinkering that often leads to insight and creativity" (Cole & Foster, 2008, p. ix). Moodle™ is an open-source Learning Management System created by Martin Dougiamas (Weller, 2007). He created the system in order to fill a particular need – the need of the educator. Dougimas wanted to build a Learning Management System that began with the educator and not the engineering side of creating a website (Cole & Foster, 2008). Moodle™ was started in 1999 and, "Version 1.0 was released in 2002…Moodle has continued to evolve at a rapid rate, managed by Martin in Australia and propelled by an active world-wide community of users and developers" (Chavan, 2004, "Introducing Moodle," para. 1).

The implementation of this technology into Extension is a reflection of the continuous effort that Extension has made to utilize new technology as it becomes available. Just as the use of filmstrips, motion pictures, television, telephone and radio were utilized in the mid to late 40s as "educational media" (Brunner & Pao Yang, 1949, p. 118). Traditionally, Extension education has primarily, "…focused on face-to-face, county-based programming, where typical, natural resource, Extension clientele have been rural residents who live on the land they own," but the way that current Extension clientele live and learn is changing and online learning is becoming a necessity (Jackson, Hopper & Clatterbuck, 2004). While Extension specialists can never be replaced, online education is, "…simply another tool through which Extension can interact with its clientele," providing more information to more people (Jackson et al., 2004, "Background," para. 2). The need for online learning is becoming ever present and more obvious each year:

> Electronic technology is revolutionizing how we learn, entertain ourselves, communicate, do our jobs, and much more. What does this mean for Extension practitioners? It means that electronic learning or "e-learning" is sending shockwaves throughout the Cooperative Extension System. It means taking advantage of a global approach to learning. Most of all, it means keeping up with strong competition and re-visioning the Extension role in an electronic era….The choice is simple: either you accept learning and adopt it or risk becoming obsolete (Williamson & Smoak, 2005, "Introduction," para. 1).

Purpose and Objective

The purpose of this historical study was to describe how and why eXtension was established and the implementation of Moodle™ as a Learning Management System (LMS) within eXtension.

Methods and Procedures

The methodology for this study was a qualitative, heuristic study consisting of personal interviews, both in person and via the telephone. The purposive sample consisted of individuals knowledgeable of the history of eXtension and the implementation of Moodle™ as a Learning Management System. Individuals were selected for participation based on their level of familiarity with early Moodle™ use in eXtension. Cresswell (2008) stated that, homogeneous sampling is a purposive sample based upon membership in a subgroup with defining characteristics. One-on-one interviews were conducted with individuals face-to-face when possible. The researcher also used telephone interviews to accommodate the schedules of some individuals interviewed.

Once the purposive sample was reviewed and approved by the researcher's peer debriefing committee, the researcher personally contacted each individual via email to brief the respondents, "…on pertinent information about the study, ensuring anonymity, explaining what will and will not be done with the data in the interview and confirming with the respondent the time and place of the interview" (Erlandson, Harris, Skipper, & Allen., 1993, p. 92). Approximately one week after the email was sent, the researcher followed up with the respondents either in person or via the telephone to set up a potential interview time, date and location. Upon communication with the sample group, the interviewer made aware the topic of informed consent. Before beginning an interview, may it be in person or via the telephone, an, "…informed consent slip(s) contain[ing] a written statement of potential risks and benefits" of the study was, "…dated and signed by both the potential subject and the researcher" (Berg, 2009, p. 88). For the privacy of the subjects, all responses and information remained confidential through the use of confidentiality coding. For example, S1 for sample1 and a letter that corresponded with the participant. After the interviews were conducted, a request for follow-up interviews was verbally addressed. However, no additional interviews were necessary for the study. To ensure accuracy, a copy of individual, interview transcripts were provided to each participant for his/her personal review via email with a request for any changes, corrections, or additional pertinent information. As data was gathered, respondents were coded and the researcher reviewed interview transcripts for overlapping themes in the collected data.

According to Lincoln and Guba (1985), interviews are "…a conversation with a purpose" (p. 268). The interview procedures outlined in *Naturalistic Inquiry* were followed during data collection. In order to obtain historical information regarding the development of eXtension and Moodle™ use nationally through Extension, semi-structured interviews were conducted with individuals who were familiar with the organization's background (Lincoln & Guba, 1985).

The data analysis method that was utilized for this study was the constant comparative method developed by Glaser and Strauss (as cited in Merriam, 1998). According to Merriam (1998), this method focuses on grounded theory that "…consists of categories, properties, and hypotheses that are the conceptual links between and among the categories and properties" (p. 159). As categories emerged from the data, they were constantly compared against one another until data saturation occurred and a theory was formulated (1998).

In order to validate the findings of the study, the researcher implemented measures to triangulate data collected during the study. Triangulation was used "…among different data sources to enhance the accuracy of the study" (Cresswell, 2008, p. 266). Credibility was attained through member checking of the individuals who were interviewed. Member checking is the process where the participants of the study are asked to verify the accuracy of the data attained from them.

Fraenkel and Wallen (2009) define historical research as, "…the systematic collection and objective evaluation of data related to past occurrences to examine causes, effects, or trends of those events that may help explain present events and anticipate future events" (p. G-4). To ensure the accuracy of this historical study, both external and internal criticisms were taken into consideration to further triangulate the data used during the study. External criticism is the process used, "…to determine the authenticity of a document or artifact…[and] should identify whether the item is an original or from a later production, printing, edition, or reproduction" (Berg, 2009, p. 304). Documents were reviewed at the recommendation of study participants to ensure the accuracy of comments shared. This study is one of the first to document the actual history of eXtension and implementation of Moodle™. Internal criticism was also taken into consideration for this study because the data was obtained through the perspectives of the participants. Internal criticism, "…seeks to assess the meaning of the statements in the document or the possible meanings and / or intentions of some artifacts which have now (through external criticism) been established as genuine" (Brickman, as cited in Berg, 2009, p. 307).

The researcher ensured trustworthiness by maintaining an audit trail and a reflexive journal throughout the interview process. Peer debriefings were conducted regularly to ensure the researcher's accuracy. The study was performed from a heuristic perspective. "Heuristics is a form of phenomenological inquiry that brings to the fore the personal experience and insights of the researcher" (Patton, 2002, p. 107). The researcher has previous and current, "…personal experience with and intense interest in the phenomenon under study" (p. 107). It is acknowledged that the potential for bias existed given that the researcher served as the research instrument.

The participants in this study were Extension educators with an extensive background in Extension. The mean number of years worked in Extension was 22.4 years, with some participants having more than 35 years of experience with Extension. In the study there were 3 females and 2 males. These individuals were contacted based on their experience with the topic under investigation, and one individual was a result of snowball sampling, the process by which the, "…researcher asks participants to identify others to become members of the sample" (Cresswell, 2008, p. 155).

Findings

Participants in the study reported very similar perspectives of the history of distance education. When asked, "When did online learning became a vision of the future?" in a general context, the individuals interviewed stated that distance education (in various forms) began in the early to mid 1980s ranging all the way to the mid to late 1990s and certain types of distance education were occurring even before then (S1A, S1B, S1C, S1D, S1E). When asked this question, most stated that there was a form of distance education in place much before the development of online learning in the form of newsletters, television, telephone, regular postal mail, and e-mail – put simply, transferring knowledge and information to individuals not capable of receiving the information first hand was available before the development of the Internet (S1A, S1B, S1C, S1D). However, when referring to the use of online education in Extension, the dates were mid 1980s to 1990s (S1A, S1B, S1C, S1D, S1E).

The participants of the study were asked to define eXtension in their own words. The overall collaborative summary of their definition was that eXtension is a national, collaborative effort to provide research-based knowledge and information to larger, broader audiences through the use of online learning (S1A, S1B, S1C, S1D, S1E).

For the purpose of this study, the researcher was interested in documenting the history of events that took place that eventually lead to the establishment of eXtension and the implementation of Moodle™ as a Learning Management System for Extension and eXtension efforts. Because Extension is an educational and research based organization, it has always sought ways to reach various audiences. As the popularity of the Internet became more evident, some Extension educators recognized the need to be involved in that movement and wanted a way to deliver existing content in a different way, other than the traditional face-to-face method (S1A, S1B, S1C, S1E).

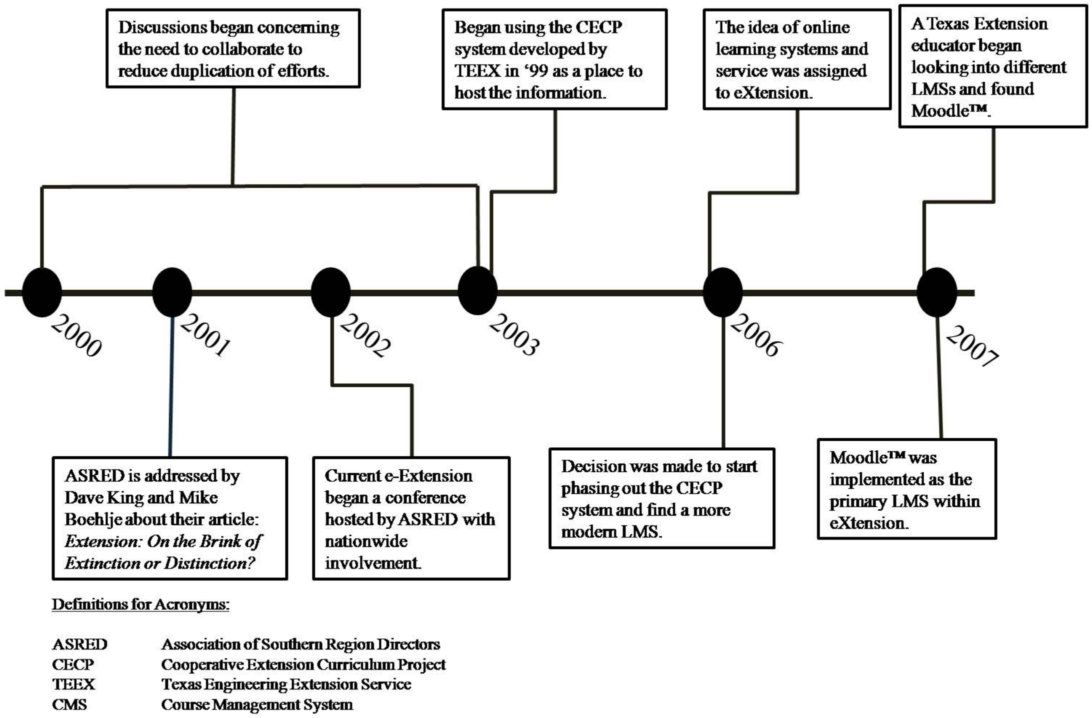

Figure 1. Timeline of events leading to the implementation of Moodle™ in eXtension.

During the 2000-2003 timeframe, discussions across the nation began concerning the need to share information across state lines because the concern of duplication of efforts had recently become a topic of interest (S1A, S1B, S1C, S1D, S1E). Also, the current e-Extension (as it was initially called) began a conference hosted by the Association of Southern Region Extension Directors (ASRED) in 2002. The directors of ASRED had been addressed by Dave King and Mike Boehlje in relation to their article, *Extension: On the Brink of Extinction or Distinction?* (S1B, S1E). As a result, the directors took action by sponsoring a conference with nationwide involvement (S1B, S1E). It was understood that the initiative would be, "…a public outreach effort that would take some years to organize and fund…other national level players continued to support this initiative as it evolved, including the National Extension Directors and Administrators Association (NEDA), the American Distance Education Consortium (ADEC), the Extension Committee on Organization and Policy (ECOP), and CSREES-USDA (Now the National Institute of Food and Agriculture)" (S1B).

Participants shared that Extension was in need of one place to put the plethora of information it had to offer in order to ensure accuracy, less duplication of effort and collaboration among states (S1A, S1B, S1C, S1D, S1E). During the late 1990s, Texas officials began researching ways to deliver online education, "With regard to trying to build some level of richness, interactivity, testing," as a result Texas Extension began using a rudimentary learning management system developed by the Texas Engineering Extension Service in 1999 (S1A, S1B, S1C). This was a system that was built in-house (because the agency is part of the Texas AgriLife Extension system, formerly Texas Cooperative Extension) and, "…partly because the major systems were not very available or were very expensive" (S1B). The in-house Learning Management System was used to deliver staff development with individuals with the knowledge to manage such a system (S1B). As a result, the small, "home grown system" (S1B) evolved into the Cooperative Extension Curriculum Project (CECP) in 2003 (S1A, S1B, S1C, S1D S1E). After the start of CECP, discussion continued regarding a national effort with focus on,

> …how we could share resources using technology. That grew from sharing learning resources internally; to include creating outreach to our clientele using technology…states recognized that if they pitched in some of their money in a national pot that they could do a better job identifying tools and resources that would extend extension electronically (S1C).

At the same time that the CECP Learning Management System was being developed by Texas Extension Engineering Service, eXtension was also in the beginning stages of development. Because both platforms were in the beginning stages, and eXtension felt the need for a Learning Management System, it seemed natural for the two to combine. However, there was always a general idea that the CECP system would be phased out in order to implement a newer, more efficient Learning Management System. According to one respondent, "These were two parallel efforts, started at the same time, fueled by different groups of people, traveling at different rates of speed, but with the intent that CECP would eventually disappear…it has essentially done so" (S1B). In 2006, the decision was made that, "…this whole online system and service…ought to be given over to eXtension" (S1B). After the merge occurred in the Fall of 2006, "…the decision was made that we proceed and start down a path towards acquiring and adopting some kind of system for use by eXtension" (S1B). In early 2007, an individual within Texas Extension began researching different learning management systems available. After much research and exploring, the individual decided to look further into the Moodle™ Learning Management System. Out of their own pocket, a year of service was purchased with a Moodle™ hosting site in order to further research the platform. Each individual interviewed played an integral role in the discovery and implementation of Moodle™ into eXtension and in the Spring of 2007 Moodle™ was adopted as the primary Learning Management System within eXtension (S1B, S1C, S1D).

The Moodle™ learning management system was chosen for a number of reasons (S1B):

- It contained much needed features.
- It was a flexible platform and open-sourced.
- It had no licensing restrictions.
- The Moodle™ system was free.
- There were several hosting sites available for a fare price.

In the Summer of 2007, after eXtension leadership had adopted Moodle™ as the method of online delivery, the process of teaching other Extension educators how to use the system began. Remote Learner, whom eXtension is contracted with to provide the Moodle™ hosting service, held a training session in Nashville, Tennessee for Extension educators interested in the efforts of eXtension (S1B, S1C). Because the individual from Texas Extension had prior experience with the Moodle™ LMS and could relate Moodle™ to Extension situations, Texas became a point of contact because of their ability to answer Moodle™ questions from an Extension perspective (S1C). According to one participant, "…since the initial implementation other states have really stepped in, especially those who really need to use online learning to leverage their resources. As a result, they are helping take it from implementation to adoption" (S1C).

As of 2009, eXtension was continuing to evolve and there are now two Moodle™ websites, *pdc.extension.org* (PDC) and *campus.extension.org* (CAMPUS). PDC is used for internal (within Extension) professional development and CAMPUS is used for external outreach. Initially, Moodle™ was intended as a place for Communities of Practice (CoPs) within eXtension to deliver online content, but since there are now two websites with different audiences, Moodle™ is not only used by eXtension CoPs, "…but also by Extension faculty at large to support their traditional education efforts" (S1B).

The evolution of eXtension was described best by one participant who used an analogy relating where eXtension is currently and where it is going, comparing it to the building of a house on the Internet (S1C). When the discussion of sharing the Learning Management System across Extension nationally began, a blue print was made, ideas were put on paper, and interest in building the eXtension house was established (S1C). Soon thereafter, various individuals contributed monetary resources and supplies to support the building of the eXtension house. Moodle™ is one component of the eXtension house. Based on comments and emphasis placed on the description of eXtension's history by those interviewed, the researcher believes that study participants would support the following eXtension house analogy:

> …we've bought our resources and now we're busy building the house…[it] is nicely framed out, but it's certainly not to a point where all the walls are in place and now we have some modifications that we need to consider to the original plans…I think that the house is being built very slowly and purposefully…because we recognize that technology is ever evolving and our family is big and growing in terms of the Extension family adopting eXtension. (S1C)

All individuals interviewed reported that eXtension has a bright future, but that it still has barriers to overcome and walls to build in the retreat center before it will be completely adopted and accepted by members of Extension (S1A, S1B, S1C, S1D, S1E). As shared by one participant, "…everybody's got to have a common vision and work towards that end" (S1E).

Each of the individuals interviewed maintained very positive views of online learning, and all shared that online learning is a valuable part of Extension's future. However, barriers to adoption were identified that were indicated as items that require attention in order for eXtension to be adopted widely. Barriers included:

- Agents have limited time to dedicate to the design and development of online learning (S1C, S1D, S1E),
- Some extension educators are unsure of technology (how to use technology in general and how to relate technology to their clientele base) (S1C),

- Limited number of technology savvy ‘extension purists’ due to fiscal constraints (S1C),
- Extension educators not being recognized for their online efforts (S1D),
- As the eXtension system continues to evolve more guidelines will need to be put into place (S1D, S1B),
- Educating Extension educators about eXtension, and explain that it is there as a resource for them, not to replace them (S1D,S1E),
- The ability of state funding to go towards online learning (S1A,S1C, S1E), and
- The current lack of marketing efforts (S1E, S1D).

Conclusions, Implications, & Recommendations

The purpose of this historical study was to describe how and why eXtension was established and the implementation of Moodle™ as a Learning Management System (LMS) within eXtension. However, the history of the development of eXtension became the ultimate discussion. Rogers (2003) defines diffusion as, “…the process in which an innovation is communicated through certain channels over time among the members of a social system” (p.5). This study is a prime example of diffusion of an innovation within eXtension. Based on the research conducted in the study, the individuals interviewed are between the fourth and fifth stages of the innovation-decision process – implementation and confirmation. The participants are currently putting the innovation of Moodle™ as a Learning Management System to use as well as seeking, “…reinforcement for [the] innovation-decision already made (Rogers, 2003, p.216). Prior to Moodle™, Extension was utilizing the Learning Management System developed by the Texas Engineering Extension Service called the Cooperative Extension Curriculum Project or CECP. This system was a great starting point, but became archaic and it was determined that an easier system should be identified. Moodle™ was later implemented in 2007.

Based on the findings from this study, it was concluded that as eXtension and the use of Moodle™ continues to grow and develop, it is important that guidelines be created but remain flexible enough to grow with the system in order to sustain the reputation of quality and the research-based background that is the foundation of eXtension. As revealed in the findings, the importance of monitoring the content that is made accessible both on the eXtension website and the two Moodle™ websites is critical in order to provide timely, relevant, and accurate materials via online courses both internally and externally for community outreach.

Findings from this study reveal that the eXtension system appears to be growing and that an awareness and use of the system is becoming standard practice throughout Extension nationally. However, the barriers addressed within the study, should not go unrecognized. The design, development, and delivery of quality online course materials require a significant amount of time and effort. Given that Extension educators have a limited amount of time to dedicate to these activities it is recommended that efforts be put in place to meet this need. Based on findings in this study, possible efforts include the inclusion of these practices in job descriptions, job sharing across agencies, skill training, and recognition for participation.

One issue revealed in the study was specifically connected to credit and recognition as it relates to online content. In any field, recognition is an important factor. However, in the field of

Extension, where the delivery of education is a primary function, recognition is vital to a lasting career. Respondents shared that it is important that Extension educators who dedicate time to creating online materials not go unnoticed. While research has shown that there is an interest by Extension educators in online professional development, it is apparent that some individuals do not know how to use the technology to serve their clientele (Senyurekli, Dworkin, & Dickinson, 2006). It is recommended that the service component of eXtension continue to provide Extension educators with the knowledge and support to create and utilize online courses. Further research should be conducted on how to make online learning a recognized form of scholarship within Extension.

Findings from this study reveal that eXtension is continuing to expand. However, it is recommended that eXtension continue to be marketed as a resource to help Extension educators and not as a replacement for their positions. Marketing of eXtension, as addressed by one participant, needs to start at the local level in order to bring about awareness by Extension educators and enable them to use eXtension resources and not feel threatened by it (S1E).

The current state of the economy creates both opportunities and challenges to the delivery of educational materials online. While delivery of materials online is perceived by some to be less expensive, it should be recognized that given current economic conditions some states are unable to contribute funding towards national objectives such as eXtension, no matter how low the cost. It is recommended that eXtension encourage states to engage in the national objective in ways that can allow them to meet state needs. The advantages of reduced travel expense using online conferencing and increased reach to clientele using Moodle™ must be documented and shared with leadership. Additional research should be conducted in this area to provide agencies with data that can support the use of technology to meet individual needs and reduce costs.

Findings from the study reveal that the Moodle™ Learning Management System has been a beneficial addition to the eXtension organization. While it was intended to be a delivery system for Communities of Practice to provide their online materials, it has now become a platform for the delivery of internal content specific to Extension through "eXtension Professional Development Courses (*pdc.extension.org*), as well as a library of knowledge for community outreach through the eXtension Campus Moodle™ Site (*campus.extension.org*). Further study should be conducted to determine the strengths, weaknesses, opportunities and threats of continuing the use of Moodle™ as a Learning Management System through eXtension. Findings from this study make known that Extension has nationally embraced the delivery of quality educational materials online and the journey is just beginning.

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An Analysis of the North Carolina Cooperative Extension Service's Role in Bridging the Digital Divide

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Abstract

The purpose of this study was to determine the perception of North Carolina County Cooperative Extension Directors in relation to the North Carolina Cooperative Extension Service's role in bridging the digital divide. It was perceived by respondents that variables such as income, education, gender, disability status, race/ethnicity, age and geographic location (rural versus urban) are major factors in the digital divide. Recommendations were made regarding North Carolina Cooperative Extension forming partnerships in order to narrow the digital divide in their regions, in addition to developing educational programming efforts in this area for all clientele served.

Introduction

The economic recession of late 2008 has greatly impacted all sectors of society, establishing the fact that mankind today lives and works in a global economy in which factors in one section of the world can have major implications for other geographic areas. This concept of a global economy is greatly shaped by technology, particularly digital technology and information access in the form of the Internet. The Internet today provides increased access to information in real time, which is then utilized by the individuals for personal decision making and by entrepreneurs to shape the future of their respective enterprises. In today's information technology depended global economy, power and money are more and more going to communities that have the ability to connect with the most bandwidth through broadband digital technology. Today's global economy is also greatly impacted by the "green initiative" with its focus upon environmental sustainability for future generations. It is perceived by many that broadband Internet technology is a platform that can empower greener technologies and support environmentally friendly economies (e-NC Authority, 2009). It is estimated that workers who telecommute are already reducing the amount of office space needed by 12 percent; this provides major environmental relief considering that construction related activities account for up to 50 percent of CO_2 emissions (Forum for the Future, 2004).

Given the aforementioned factors can digital technology itself be the major transforming factor in how the global economy and to larger extent the environment as a whole is impacted by mankind. Research suggests that it can, but will be impacted by three major factors:

- The total power of digital technology will only be realized when all individuals are able to utilize it for their personal and professional lives.
- By digital technology being "evergreen", as technology evolves the bandwidth will expand thus have the ability to transmit more information over faster networks. This in essence will require close scrutiny of what digital technologies are being utilized so adequate networks and bandwidth for communities and economic goals are ultimately achieved.
- With the rapid pace of technological change infrastructure upgrades will be constantly needed, requiring comprehensive and cross cutting planning efforts to maximize the return on the investment made ultimately (e-NC Authority, 2009).

Digital Divide Economics

According to estimates by the U.S. Bureau of Economic Analysis estimates that every dollar invested in broadband digital technology returns another $3 to the economy (Crandall, Jackson, Singer, 2003). In contrast it is also stated that the failure to make this investment has be estimated to reduce productivity one percent per year or more (Ferguson, 2002). It is estimated that in some states a one percent increase in states' broadband penetration results in 0.2-0.3 percent increase in employment. For North Carolina the presence of an increase broadband penetration could bring between 9,100-12,700 new jobs (Crandall, Lehr, & Litan, 2007).

North Carolina and the Digital Divide

With a population of over nine million individuals North Carolina is a very diverse state, that has experienced major shifts in its demographic and economic profile over the past decade (U.S. Census Bureau, 2009; e-NC Authority, 2007). The traditional jobs in textiles, tobacco, and manufacturing have gave way to occupations closely associated with information technology and biotechnology. With this shift it is becoming more evident that communities which do not possess access to broadband technology are at a very profound economic and educational disadvantage. In relation to Internet access in North Carolina as of 2008 83.54 percent of households have access to high speed Internet. In North Carolina twenty-one counties have less than 70 percent access to high-speed Internet service, with four counties having less than 50 percent access, with regard to computers in the home, as of September 2008, in North Carolina 80 percent of households had computers, an increase of 57 percent from 1999. During this same time frame the adoption rate of Internet access increased over 94 percent. When looking at adult computer use 62 percent of North Carolina adults in 1999 reporting using the "Internet Anywhere" (defined as home, work, or public access site), today the percentage has increased to 82.

North Carolina Cooperative Extension and the Digital Divide

The mission of the North Carolina Cooperative Extension Service in relation to community focus is to help build quality communities by training adult and youth volunteers to become community leaders, providing educational programs to stimulate community economic development, working in partnership with other agencies to help citizens prepare for and recover from disasters and more. Through educational programs, publications, and events, Cooperative Extension field faculty deliver unbiased, research-based information to North Carolina citizens (North Carolina Cooperative Extension Service, 2009). According to the e-NC Authority (2009) all educational organizations including nonprofits should work to encourage **digital literacy**, which is defined as the use and adoption of information and communication technologies (ICT) within their organizations. Given the aforementioned statements and the economic importance of digital technology to the future of North Carolina, what role can the North Carolina Cooperative Extension Service play in bridging the digital divide and in promoting digital literacy?

Theoretical Framework

In order gauge the role of the North Carolina Cooperative Extension Service in bridging the digital divide the theoretical framework for this study was guided by E.M. Rogers's (1995) diffusion of innovations theory. This theory was initially designed to describe patterns of adoption, explain the mechanism, and assist in predicting whether and how a new invention will be successful. According to the diffusion of innovation theory, technological innovation is communicated through particular channels, over time, among the members of a social system. The stages through which a technological innovation passes are knowledge (exposure to its existence, and understanding of its functions), persuasion (the forming of a favorable attitude to it), decision (commitment to its adoption), implementation (putting it to use), and confirmation (reinforcement based on positive outcomes from it). Additionally innovations have certain characteristics: relative advantage (the degree to which it is perceived to be better than what it supersedes), compatibility (consistency with existing values, past experiences and needs), complexity (difficulty of understanding and use), trial-ability (the degree to which it can be experimented with on a limited basis), and observability (the visibility of its results). The diffusion of innovation theory also classifies individuals into technology adopter categories, which directly relates to the considerations that extension personnel must perhaps be concerned with when developing strategies to aid in the closure of the digital divide (Figure 1). The adopter categories are innovators (venturesome), early adopters (respectable), early majority (deliberate), late majority (skeptical), and laggards (traditional).

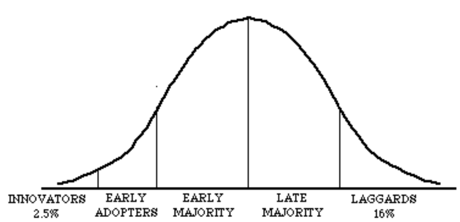

Figure 1. Bell shaped curve showing categories of individual innovativeness and percentages within each category

Innovators and earlier adopting individuals tend not to be different in age, but to have more years of education, higher social status and upward social mobility, be in larger organizations, have greater empathy, less dogmatism, a greater ability to deal with abstractions, greater rationality, greater intelligence, a greater ability to cope with uncertainty and risk, higher aspirations, more contact with other people, greater exposure to both mass media and interpersonal communications channels and engage in more active information seeking. Innovators and early adopting individuals are so imperative to the technology diffusion process of perhaps closing the digital divide, because they can initially act as the first agents of change in influencing other parties as to the relative advantage of a particular innovation.

Another imperative component of the diffusion of innovation theory concerns the roles that individuals play in the process. Important roles in the innovation process include: opinion leaders (who have relatively frequent informal influence over the behavior of others); change agents (who positively influence innovation decisions, by mediating between the change agency and the relevant social system); change aides (who complement the change agent, by having more intensive contact with clients, and who have less competence credibility but more safety or trustworthiness credibility). The change agent functions are: to develop a need for change on the part of the client; to establish an information-exchange relationship; to diagnose the client problems; to create intent to change in the client; to translate this intent into action; to stabilize adoption and prevent discontinuance; and to shift the client from reliance on the change agent to self-reliance. The aforementioned theory provides the structure for this study in several ways. First in order for the digital divide gap to be narrowed and eventually eliminated individuals must be exposed to the technology and shown the relative advantage of adoption. Secondly the individual must be allowed to practice with the innovation while at the same time infusing the technology into their existing value structure. Moreover, and most importantly the individual must be allowed constant access to the technology in order to allow for trialability.

Purpose and Research Questions

The purpose of this study was to determine the perception of North Carolina County Cooperative Extension Directors in relation to the North Carolina Cooperative Extension Service roles in bridging the digital divide. To accomplish the aforementioned purpose, the following research questions were developed:

1. What are the general perceptions of North Carolina County Cooperative Extension Directors in relation to the socio-demographics characteristics that impact the digital divide in North Carolina?

2. What are the general perceptions of the North Carolina County Cooperative Extension Directors in relation to extension roles in bridging the digital gap?

3. What are the demographics of the North Carolina Cooperative Extension County Directors?

Methodology

The population for this study consisted of all North Carolina County Level Extension Directors (N = 101). The survey utilized for this descriptive study was adapted from a study conducted by Elbert & Alston (2005). The validity of the instrument was originally established by means of content validity. Brown (1983) defined content validity as “the degree to which items on a test representatively sample the underlying content domain” (p 487). Brown recommended using expert judges as one means of establishing content validity. A panel of experts at North Carolina Agricultural and Technical State University and Texas A&M University, consisting of agricultural education researcher's reviewed the instrument for content validity. For Elbert and Alston's (2005) study a pilot test of the instrument was conducted resulting in a Cronbach's alpha reliability coefficient of .88; thus, the instrument was deemed to be reliable. The survey instrument for this study consisted of three sections: Part I. Digital Divide Socio-Demographic Characteristics, Part II. Extension in the Digital Divide and Part III. Demographics. Parts I and II consisted of Likert-type items; Part III consisted of a series of open-ended and multiple-choice items. Sections one and two consisted of twenty-two questions collectively and utilized a five-point Likert-type scale with the following responses: 1=Strongly Disagree, 2=Disagree, 3=Uncertain, 4=Agree, and 5=Strongly Agree.

The survey was conducted on all one hundred county extension administrators. An initial letter notifying the Extension administrators of the survey was sent by mail one week before the survey was mailed. One week after the initial mailing, the survey was sent to each administrator by email with instructions. After the first week fifteen surveys were received. After this a reminder email was sent, which resulted in eighteen more surveys being received. After the first two mailings had been accomplished, a full survey packet was mailed to all non-respondents through traditional mail, which resulted in seven more surveys. Finally, follow-up phone calls were made to all non-respondents in order to yield a maximum return rate; six more surveys were received from this round. The final response rate was 46% (N = 46).

In order to control for non-response error, Miller and Smith (1983) recommended comparing early to late respondents. Upon completion of the study, an evaluation of the data showed that there were no significant differences found among the early respondents (respondents during the first round) and the late respondents (respondents after the first round).

Findings

North Carolina Cooperative Extension Directors were asked to provide their views of the impact of selected socio-demographics characteristics in relation to the digital divide. Table 1 displays the mean, standard deviation, and means rank for socio-demographic questions used for this study. For the purpose of data analysis, readers should utilize the following specifications when interpreting the scale for tables one and two: 1.00–1.49= Strongly Disagree, 1.50–2.49= Disagree, 2.50-3.49=Undecided, 3.50– 4.49=Agree and 4.50–5.00=Strongly Agree.

In relation to, the aforementioned characteristics respondents agreed that younger Americans were more likely to use the Internet compared to older Americans. In relation to an individual's educational level and their usage of the Internet, Cooperative Extension County Directors agreed an individual with higher educational attainment were more likely to have access to the Internet compared to lower educational levels. In terms of income, respondents agreed that households with higher incomes were more likely to have access to technologies such as the Internet compared to the lower income households. Respondents were in agreement that those who were not fortunate enough to afford the Internet are left out from the services the Internet can provide as far as advancing their current status by searching for new employment, taking courses or conducting research for school. Cooperative Extension County Directors agreed that the gap between rural households and households nationwide had narrowed over the past two years. On the subject of the digital divide becoming less significant, respondents agreed that more information is becoming electronically based and the poor are missing a significant amount of information; therefore, causing the digital divide to become more pronounced.

Respondents were undecided on minorities having less access to technology compared to the majority population. In terms of giving their perceptions on those individuals who would gain the most from the usage of having access to the Internet Cooperative Extension County Directors were neutral in their responses. Lastly, in relation to the relationship of individuals with disabilities and their access to the Internet, respondents were undecided.

Table 1. ***Digital Divide Socio-demographics Characteristics*** **(N= 46)**

Socio-demographic Characteristics	N	Mean	SD	Rank
1. Younger Americans are more likely to use the Internet than older Americans overall.	46	4.65	.604	1
2. Individuals of higher educational attainment levels are more likely to have access to the Internet than individuals of lower educational attainment levels.	46	4.04	.788	2
3. Households with incomes of $75,000 and higher are more than twenty times as likely to have access to technologies such as the Internet than those at the lowest income levels.	46	3.82	.716	3
4. The information poor are left out of the opportunity to use the Internet to improve and advance their current status by using it to search for jobs, to take courses, or to do school research.	46	3.61	.881	4
5. The gap between rural households and households nationwide has narrowed over the past two year.	46	3.59	.884	5
6. The digital divide is not becoming less significant but rather more pronounced as the information rich outpace the information poor in gaining access to electronic resources.	46	3.50	.831	6
7. Minorities have less access technology than the majority population.	46	3.48	.888	7
8. The people who have the most to gain from using the Internet are the same people who are the least likely to have access to it.	46	3.37	.826	8
9. There is a significant gap between genders in relation to Internet usage.	46	2.54	.912	9
10. Individuals with disabilities are less likely to access to technology than those without a disability.	46	2.83	.851	10

Scale: 1=Strongly Disagree, 2= Disagree, 3= Undecided, 4= Agree, 5= Strongly Agree.

Respondents were asked to provide their general perceptions of the North Carolina Cooperative Extension Service's role in bridging the digital divide (Table 2). In general, the respondents agreed through various technological applications, extension can provide individuals through digital technology and/or distance education unbiased, research-based information and education. Actually, county directors agreed that farmers can be encouraged to utilized digital technology by way of Cooperative Extension educators.

Cooperative Extension County Directors agreed that Cooperative Extension agents should be knowledgeable of the latest advancements in digital technology. Respondents decided that Cooperative Extension agents should have constant in service training in the latest advancements in digital technology. By way of the 4-H youth development, Cooperative Extension County Directors agreed that youth are able to learn the new advantages in technology. Respondents also agreed that extension service should expand its teaching to fit the needs of in time learning. In terms of programs geared around community resource development, County Directors agreed that they should have a stronger focus in technology. Directors were knowledgeable about how much of an impact Cooperative Extension services could provide to lower income communities and minorities in relation to technology access. County Directors were unsure about creating local partnerships with learning centers, libraries and schools, local extension offices being staffed and equipped to become learning centers with technology, having Cooperative Extension offer alternate means of technology access in rural areas, and the North Carolina Cooperative Service being prepared to assist clientele in bridging the digital divide.

Table 2. ***Extension in the Digital Divide*** **(N=46)**

Extension Variables	N	Mean	SD	Rank
1. Lifelong learning applications using digital technologies and distance education offer limitless possibilities to engage multiple audiences, expanding Extension's educational role as a "brand name" quality source for unbiased, research-based information and education.	46	3.93	.654	1
2. Cooperative Extension agents can be an effective means of encouraging farmers to adopt digital technology.	46	3.91	.668	2
3. Cooperative Extension agents should have constant in service training in the latest advancements in digital technology.	46	3.89	.745	3
4. The 4-H youth development component of the extension service can aid in technology access in order to improve their daily lives.	46	3.75	.686	4

5. The extension service should expand its learning information system to support just in time learning.	46	3.72	.861	5
6. Community resource development programs in cooperative extension should have a strong technology focus.	46	3.64	.679	6
7. Cooperative Extension can aid lower income communities in gaining wider access to technology.	46	3.53	.991	7
8. Cooperative Extension can aid minority communities in gaining wider access to technology.	46	3.51	.944	8
9. Partnerships can be established by cooperative extension to manage learning centers in malls, libraries, and schools.	46	3.45	.901	9
10. Local extension offices should be equipped and staffed to become local centers of learning with technology.	46	3.44	.990	10
11. Alternative means of technology access for rural areas can be developed by cooperative extension.	46	3.36	.917	11
12. The North Carolina Cooperative Extension Service is adequately prepared to assist the public in bridging the current digital divide.	46	2.61	.829	12

Scale: 1= Strongly Disagree, 2= Disagree, 3= Undecided, 4= Agree, 5= Strongly Agree.

Research question three discusses the demographics of the North Carolina Cooperative Extension County Directors. The following demographic variables were discussed within Table 3: age, gender, race or ethnicity, educational background; years of extension service, years of extension administrator and hours of training in the area of technology within the past 5 years. In regards to age, North Carolina Cooperative Extension County Directors reported a mean age of 49. According to the data, 28 of the County Directors in North Carolina were males whereas only 18 were females. In regards to race or ethnicity, there were 40 Caucasians, 5 African Americans and 1 Native American. Nonetheless, there were no Hispanics or Asian Cooperative Extension County Directors reported.

In relation to education, respondents were asked to provide their highest level of education earned in Table 3. Cooperative Extension County Directors possessed a total of 45 graduate degrees (40 Master's and 5 Doctorate). One County Extension Director held just a Bachelor's degree – apparently no one held any specialist degree.

In relation to the years in extension, collectively the County Directors served 22 mean years in extension. In terms of administration extension experience, respondents reported a mean of 9 years. Respondents indicated that in past 5 years, they have attended an average mean of 25 hours of training in technology.

Table 3. ***Demographics*** **(N=46)**

Respondents Demographics	N	Mean/Percentage	SD
1. Age	46	49.54	
2. Gender:			
Male	28	60.9%	
Female	18	39.1%	
3. Race/Ethnicity			
Black	5	10.9%	
White	40	87.0%	
Hispanic	0	0%	
Native American	1	2.2%	
Asian	0	0%	
4. Highest Degree Earned			
Bachelor's	1	2.2%	
Master's	40	87.0%	
Specialist	0	0%	
Doctorate	5	10.9%	
5. Years of Extension Service	46	22.00	7.809
6. Year as an Extension Administrator	46	9.41	7.114
7. Hours of Technology in past 5 years	46	24.98	12.463

Conclusions

It was perceived by survey respondents that younger Americans were more likely to use the Internet than older Americans. According to Elbert & Alston (2005), younger Americans were likely to utilize the Internet compared to the number Americans over the age of 50. Perhaps this is based upon the fact that today's youth are exposed to digital technology such as the Internet from infancy and therefore, has little to no apprehension with its usage in their daily personal and professional dealings.   In addition, Wilson et al (2004) examined adult between the ages of 18-24 and noticed how their level of education played a vital role in preparing them in terms of skills and procedures used in this technological world.   "Leveraging the Power of Youth" is a guiding principle of the e-NC Authority, recognizing that young people can be major change agents in moving local communities toward the adoption of computer technology and the Internet (e-NC Authority, 2009).

Respondents on the average indicated no knowledge of a gap in genders in relation to usage of the Internet. This is direct contrast to Shade (2002) who acknowledged that males felt more comfortable with; adaptable to and less anxious with computer technology. In their study it was found that men prefer to use the Internet for information gathering and entertainment, whereas women prefer to use the Internet for interpersonal communication. According to brain based research males tend to be more spatially, mechanically, and mathematically oriented whereas females tend to be more adapt at recognizing emotional overtones in others and in language, emotional and artistic expressiveness, esthetic appreciation, verbal language and carrying out detailed and pre-planned tasks (Blum, 1997, Bishop & Wahlsten, 1997, and 1998).

North Carolina Cooperative Extension County Directors were unaware about the individuals with disabilities and their usage of technology. Salend (2005) indicated that computer technology and the Internet have a tremendous potential to broaden the lives and increase the independence of people with disabilities. Smith (1998) stated that people with disabilities in rural areas now have an extremely powerful and adaptable communication tool that can reduce isolation and provide access to a vast range of services and information. North Carolina Cooperative Extension Personnel, given their mission of providing educational programming to all sectors of the public clientele, may need in-service training on the particular concerns/needs of individuals with disabilities in the respective communities they serve.

North Carolina Cooperative Extension County Director agreed that households with incomes 75,000 and higher were more likely to have access to technology than those with lower incomes. This finding indicates that County Directors in North Carolina recognized that income is major factor in households whom have the Internet compared to those who do not produce the same income. The e-NC Authority (2009) indicated that Internet access has a tremendous effect on every level of the economy promoting positive economic growth and performance in ways that are significant and comprehensive.

In general, North Carolina Cooperative Extension County Director agreed the digital divide is not becoming less significant but rather more pronounced as the information rich outpace the information poor in gaining access to electronic resources. Also, they agreed that information poor are left out of the opportunity to use the Internet to improve and advance their current status by using it to search for jobs, to enroll in courses, or perform school research. The data indicates that County Directors are knowledgeable about improvements that need to be made to inform the poor about the advantages of using the Internet especially when seeking employment, conducting school research or enrolling in courses. This is supported by the e-NC Authority's principle of Inclusiveness, which indicates that all populations regardless of age or income must have equal access to the opportunities brought about by broadband Internet (e-NC Authority, 2009). North Carolina Cooperative Extension County Directors agreed individual's' of higher educational attainment levels are more likely to have Internet than those with lower education levels. Wilson, Reiser, Potter and Wallin (2004) stated over the period of their study between 1999 and 2004 – an individuals' educational attainment within North Carolina increased in reference to their computer access. This finding indicates that the Cooperative Extension County Directors are aware that education plays a major role in relation to digital technology access and can affect a person's future quality of living.

Respondents agreed that the digital divide gap has narrowed between rural and urban communities. This is supported by findings from the e-NC Authority (2007 & 2009) who indicate that rural regions of the state have made significant progress in relation to their digital access, but gaps still remain in some areas of the state. With regard to race, respondents were undecided about if minorities had less access to technology than the majority population. Whitacre & Mills (2003) indicated that Caucasians had greater access to and usage of the Internet than African Americans. In addition, non-Hispanics showed greater usage of the Internet than Hispanics (Compaine, 2001; National Telecommunications and Information Administration and Economics Statistics Administration [NTIA], 2002). African Americans and Hispanics are less likely to be connected to the internet compared to Caucasian at home (Shade, 2002).

In relation to The North Carolina Cooperative Extension Service's role in bridging the digital divide it was agreed upon by respondents that digital technology should be an integral part of extension's educational programming efforts, extension community resource development programs have strong technology focus, extension programming aid minorities in obtaining digital access, 4-H be utilized as a mechanism of technology dispersion, local partnerships be established by cooperative extension for digital technology promotion, and digital technology access for rural areas be promoted by cooperative extension. In contrast to the aforementioned findings respondents were undecided if the North Carolina Cooperative Extension Service was ready prepared to assist the public in bridging the digital divide. The e-NC Authority (2009) indicated that all educational entities in North Carolina in addition to nonprofits should work to encourage digital literacy.

Recommendations

Based upon the findings of this study the following recommendations are made:

- Cooperative Extension County Directors should establish partnerships with the local community college(s), churches, libraries, high schools, and telecommunication providers to assist lower income youth and adults in gaining better access to technology – to increase their employment status in both rural and urban areas.
- To narrow the digital divide occurring between younger Americans and older Americans, services need to be developed and geared to teach older Americans about digital technology; which can be facilitated through Cooperative Extension.
- Cooperative extension directors could establish partnerships with telecommunications providers to encourage digital access be made available to underserved communities and populations.

Implications

Shade (2002) indicated that income, education, age, gender, race/ethnicity, and geographic location will continue to be the factors that impact the digital divide. Results from this study can aid county directors in developing policies and educational programming to assist the clients they serve in gaining more access to digital technology; thereby, improving their daily lives.

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Student Perceptions of Distance Education in a Career and Technical Teacher Education Program

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Abstract

The multi-fold purpose of this descriptive study was to determine the perceptions of students enrolled in the Career and Technical Teacher Education program through distance delivery methods at [Name] University with respect to effectiveness of the delivery methods, barriers to participating in courses and programs via distance education methodologies, and to obtain specific demographic data regarding distance students in the program. The study was also designed to determine the preferred delivery methods of distance education and factors that influence the adoption of distance education. The majority of this group of distance education adopters was female and was under 30 years of age. Within this group of participants, distance education holds many positive aspects but does not appear to be the delivery method of choice. Congruent with previous research, (Kassop, 2003; Kumrow, 2007), this group of students held a high perception of the effectiveness of distance delivered courses and even agree that they learn more through distance delivery than through live lectures. Within this group, the inability to effectively add to class discussions and the difficulties associated with learning more independently than what was experienced in traditional courses appeared to be the greatest barriers to choosing distance courses

Introduction / Conceptual Framework

Opportunities for students to participate in courses via distance education are becoming more and more prominent in today's post-secondary environment. According to the National Center for Educational Statistics (NCES), in the school year 2000-2001, approximately 56% of institutions that offer 2 and 4 year degrees offered classes via distance education and twelve percent of all institutions were planning to offer courses utilizing distance education within the next three years (National Center for Educational Statistics, 2003). By the 2006-2007 school year, the number of 2 and 4 year institutions that offered distance courses had increased to 66% and an overwhelming 97% of all institutions with enrollment of 10,000 or more students were offering distance delivered course work (National Center for Educational Statistics, 2008).

What was once referred to as "correspondence" courses, where content, literature, and assignments were delivered to students through the postal service, distance education has continually evolved through the implementation of emerging communication technologies (Swan, Jackman, & Grubbs, 2005). Many institutions are using online delivery platforms, such as Blackboard Learning System©, Desire to Learn©, Angel©, etc. to communicate with students (Maring, Costello, & Plack, 2008). In addition, many colleges and universities now offer blended or hybrid courses that are partially delivered via the internet with some in class or face to face interaction as well (Kumrow, 2007). As Truman so aptly stated, "the shift from the perception that distance education serves the student stranded in the backwoods or desert is making room for the student just down the street with a harried schedule, family or social commitments, illness, disability or learning preference” (as cited in Swan, Jackman, & Grubbs, 2005, p.50).

Web-based instruction may be gaining in popularity due to some of the benefits it presents to today’s students. Benefits such as convenience, time efficiency and cost effectiveness make web based instruction very appealing (Andrews & Demps, 2003; Morgenthaler, 2009). Some researchers have determined that students who may struggle with traditional instructional methods may benefit from being able to be in touch with other classmates and instructors outside of the traditional class times via the internet (Strickland, 2009). The lower performing student may also benefit from the ability to learn at their own pace as opposed to the traditional classroom where PowerPoint© slide shows may be shown and lectures may be given only once, thus requiring students to take adequate notes during the class period to study for exams (Maring, et al., 2008). Web based instructional styles also allow students with responsibilities outside the academic world to further his or her education while maintaining a balance in their home life (Gallagher, et al., 2005).

The instructional technologies that are being implemented in the post-secondary educational environment are constantly being improved to better provide alternatives and beneficial opportunities to students who are unable to attend class sessions on campus due to individual constraints and unique situations. As communication technologies are being developed and implemented in the post-secondary educational system, they are increasingly presenting as many problematic issues as beneficial opportunities A research study completed by Kelsey, Lindner, & Dooley (2002) found that “poorly functioning technology and inaccessible resources and educational materials served to aggravate students” (p.31). In most cases, expensive equipment and other educational resources are being expanded with little or no research data as to the effectiveness of the communication technologies in delivering an adequate, meaningful, and beneficial education that meets the individual needs of all students (Swan, Jackman, & Grubbs, 2005). A variety of other barriers to distance education have been described including lack of face-to-face contact, lack of faculty time/support, technology issues, lack of student services, and expenses (Nelson & Thompson, 2005).

As the acceptance of distance education course work has increased as a legitimate means of study, institutions of higher education have attempted to keep pace with the growing demand for course work and full degree programs offered at a distance (Lindner, Dooley, & Murphy, 2001). Distance education allows a wide range of individuals to enroll in post-secondary educational programs who are unable to attend classes on campus. Reasons for the adoption of distance education by students are numerous and unique to the individual student or situation (Kelsey, Lindner, & Dooley, 2002). “Distance education provides access to individuals in different geographical locations, individuals unable to attend classes on campus, and individuals who prefer to control the timing and pace of their learning” (Filcher & Miller, 2000, p.60). Swan, Jackman, and Grubbs (2005) described distance education as courses designed with the ability to serve a variety of instructional needs and specific educational goals so that students are given post-secondary opportunities regardless of conflicts such as geographic location and schedule.

The current trend of the Career and Technical Teacher Education Program at [Name] University is to increase the number of students enrolled through distance education technologies and teaching methodologies. The Career and Technical Teacher Education Program at [Name] University uses state of the art equipment to deliver courses through distance education to agricultural education and business education students. This program provides distance education courses primarily to graduate students, but a number of undergraduate courses are available via distance technology to those who are seeking teacher certification through the alternative path which requires 12 additional hours of undergraduate course work beyond the conferred baccalaureate degree in an appropriate agricultural or business field. In addition to those seeking alternative baccalaureate level teacher certification, other students in this program are seeking a traditional master's degree in either agricultural or business education that was designed for those who already hold a teacher's certificate for secondary and middle school agriculture or business education. Other students in this program may seek an alternative master's degree that results in teacher certification for those with a baccalaureate degree in a technical field of agriculture or business, a specialist degree in either agricultural education or business education, or a doctor of philosophy degree in Career and Technical Education. In order for the increasingly advanced communications and instructional technologies to be effective in constructing a program that delivers a meaningful education to off-campus students, the technologies and the methods used to implement them in instruction must be consistently evaluated. Evaluation of distance learning, teaching effectiveness, overall course quality, and technological components is difficult since many of the students and instructors have little or no face-to-face contact. However, previous research has shown the relevance and vital nature of evaluating the effectiveness of distance learning experiences to remain adaptive to the needs of the student population (Gibson, Brewer, Dholakia, Vouk, & Blitzer, 1995).

A study conducted by McCann (2006), compared learning styles of students enrolled in distance education courses and the type of instruction they were receiving and found that "online instruction can be just as effective as the more traditional face-to-face instruction" (p.21). Distance education accommodates a wide range of students (Wilson & Moore, 2004) whose individual reasons for adopting distance education courses are as unique as the students themselves. Roberts and Dyer (2005) described student motivation, self-efficacy, critical thinking disposition, computer proficiency, and attitude as being key variables affecting academic achievement in distance education. In order to effectively evaluate the effectiveness of distance education compared to face-to-face instruction, Kelsey, Lindner, & Dooley (2002) identified a list of variables that predict student satisfaction including motivation, support services, social presence, technology, interaction with faculty and other students, course management, promptness of material delivery, and willingness to enroll in a second distance education course. "Collecting data about student satisfaction with distance education courses has the potential benefit of guiding decision-making with respect to planning and providing educational services" (Kelsey, Lindner, & Dooley, 2002, p.26).

Purpose

The purpose of this study was to determine the perceptions of students enrolled in the Career and Technical Teacher Education Program through distance delivery methods at [Name] University with respect to effectiveness of the coursework, barriers to participating in courses and programs via distance education methodologies, and to obtain specific demographic data regarding the adopters of distance education. The study additionally addressed preferred delivery methods of distance education and factors that influence the adoption of distance education. To achieve this purpose, the following research questions served as guidelines:

Research Questions

To achieve this purpose, the following research questions served as guidelines:

1. What are the demographics of current adopters of Career and Technical Education distance education students at [Name] University?

2. Compared to face-to-face courses, how do students perceive the effectiveness of distance courses?

3. What factors influence the adoption and perceived effectiveness of distance education courses in Career and Technical Teacher Education?

4. What are the significant barriers affecting the delivery of online courses in Career and Technical Teacher Education program as perceived by students?

5. What are the preferred delivery methods of distance education?

Methods / Procedures

A researcher-designed questionnaire was used to collect data from 24 distance education students in a career and technical education program at [Name] University (i.e., a purposive sample), (Leedy & Ormrod, 2005) for this descriptive study. Data concerning student perspectives regarding distance delivery in the Career and Technical Teacher Education Program at [Name] University were collected and analyzed. The target population consisted of students currently enrolled in the Career and Technical Teacher Education Program at [Name] University who take courses off-campus through various distance education methodologies (N=54).

Participants for the study were selected from a list maintained by the Department of Curriculum and Teaching at [Name] University. This list was comprised of students who were currently enrolled in off-campus courses in the Career and Technical Teacher Education Program. Data were collected through a researcher developed questionnaire that was based on Marsh's "Student's Evaluations of Educational Quality" (SEEQ) questionnaire (Marsh & Bailey, 1993) The participants were asked to provide their perceptions of various aspects of the distance education program in Career and Technical Teacher Education at [Name] University. The instrument was presented to faculty members and other experts in the field of career and technical teacher education to determine face validity. The instrument was adjusted and modified based on the recommendations of the aforementioned experts. The web-based instrument required approximately 15 minutes to complete. Anonymous descriptive data was analyzed using

SPSS to describe the participants in terms of means and frequencies. Institutional Review Board (IRB) approval was obtained prior to conducting the survey.

An electronic mail message was sent to all distance education students who were currently enrolled asking them to help provide feedback to improve distance education programming in Career and Technical Teacher Education at [Name] University. The message explained that participation was voluntary and their decision not to participate would in no way adversely affect them. A link to the electronic questionnaire was provided for the participant in the body of the message. After two weeks, a reminder email was sent to potential participants. After four weeks, a final email was sent to provide an opportunity for participation. Fifty -four students were emailed the questionnaire and 24 participants responded for a total response rate of 44.44 %.

The questionnaire was designed to elicit information in five different areas; demographics, preferences concerning distance delivery formats, perceived effectiveness of distance education, factors that influenced participation in distance education, and perceived barriers to distance education. Each statement was designed to coincide with a 5 point "Likert" scale that indicated participants' level of agreement. The descriptors for the "Agreement" scale were "5" = "Strongly Agree," "4" = "Agree," "3" = "Neither Agree nor Disagree," "2" = "Disagree," and "1" = "Strongly Disagree." Cronbach's coefficient alpha reliability estimates for the agreement scale for the perceived effectiveness of distance education (13 items), factors that influenced participation (4 items), and perceived barriers (21 items) were .91, .81, and .89 respectively. The questionnaire items were reviewed and validated by a panel of researchers, teacher educators, distance education specialists, and distance education students. Data were analyzed using descriptive statistics, including the calculation of frequencies, percentages, means, standard deviations, and rankings.

Results / Findings

Of the 24 respondents, 18 were female and six were male. While the majority of participants were 30 years old or younger, the participants ranged in age from 21 to 39 years old. Twenty-one of the participants identified their ethnicity as "white" while two indicated that they were African American and one did not specify ethnicity. Twenty of the participants were from the state of Alabama, three were from Georgia, and one was from Tennessee. The participants had taken distance courses through a variety of formats which included both synchronous and asynchronous presentations. The majority of the participants (62.5%) were enrolled in a degree program that was delivered completely through distance education (Table 1).

Table 1.
Demographic Information (N=24)

Characteristic	*f*	%
Gender		
Female	18	75
Male	6	25
Age		
21-26 years	11	45.8
27-30 years	1	4.2
30-35 years	5	20.8
36-38 years	2	8.4
39 or older	4	16.7
Location- State		
Alabama	20	83.3
Tennessee	1	4.2
Georgia	3	12.5
Format of Distance Courses Taken		
Email Correspondence Only	2	8.4
Blackboard©	9	37.5
Blackboard© with on-campus class video	17	70.8
Degree Program Format		
Entirely Distance	15	62.5
Distance and Face to Face	9	37.5

When questioned concerning the perceived effectiveness of distance delivered course work, the statement that received the highest level of agreement was, “If I had the opportunity, I would attend class face-to-face rather than distance.” (M=4.33). Interestingly, the next two questions/statements, in terms of level of participant agreement, included “I believe that distance learning is more effective than traditional face to face delivery.” and “I believe that I can learn more or would learn more through on-line material than through lectures.” Further, the two items that received the lowest level of agreement included, “I prefer distance learning courses to traditional courses.” (M=3.92) and “Distance learning does not offer any advantages to me.” (M=3.96) (Table 2).

Table 2
Distance Education Students' Perceptions Concerning the Effectiveness of Distance Education (N = 24)

Statement	Mean	SD
I would benefit if there were more distance learning courses.	4.25	.74
Distance learning does not offer any advantages to me.	3.96	.93
If I had the opportunity, I would attend class face-to-face rather than distance.	4.33	.64
I believe that I can learn more or would learn more through on-line material than through lectures.	4.29	.81
I believe that distance learning is more effective than traditional face to face delivery.	4.29	.86
My grades are better in distance learning courses than face-to-face courses.	4.17	.76
In a course with both traditional and distance learning methodologies, I learn better through the distance learning portion.	4.13	1.08
I would like to have more courses taught via distance.	4.13	.95
I prefer distance learning courses to traditional courses.	3.92	1.06
I make better grades in on-campus than distance education courses.	4.04	.95
I believe that I can learn the same amount in a distance learning course as in a traditional course.	4.21	.72
I believe that I can make the same grade in a distance learning course as in a traditional course.	4.13	.90
I will take another distance education course.	4.13	.99

When questioned concerning the reasons why they chose distance education course work, the statement that received the highest level of agreement was "Distance learning works well with my schedule." (M=4.38). The statement that received lowest level of agreement was, "Distance learning courses save me time." (M=4.21) (Table 3).

Table 3
Distance Education Students' Perceptions Concerning Why They Chose Distance Education (N = 24)

Statement	M	SD
Distance learning courses save me time.	4.21	.93
Distance learning works well with my schedule.	4.38	.71

Distance learning works well with my schedule.	4.38	.71
Distance learning enables me to enroll in classes more frequently than traditional courses.	4.33	.56
Distance learning enables me to take more courses than the traditional methodology in a year.	4.29	.62

When questioned concerning the perceived barriers to participating in a distance delivered course, participants indicated that they agreed most with the statement "I find it difficult to contribute to class discussions in distance courses." (M=4.42) Other statements that received high levels of agreement included: "Distance learning courses require more effort than face-to-face courses." (M=4.04) and "I found it difficult to learn without physically being in class." (M=4.04) (Table 4).

Table 4.
Distance Education Students' Perceptions Concerning Barriers to Distance Education (N = 24)

Statement	**M**	**SD**
Distance learning requires significant changes by a student.	4.00	.93
Distance learning courses make me uncomfortable.	4.00	.93
I find it difficult to contribute to class discussions in distance courses.	4.42	.50
Distance learning courses require more effort than face-to-face courses.	4.04	1.04
I found it difficult to learn without physically being in class.	4.04	.95

Table 4. Continued

Statement	**M**	**SD**
Time commitment.	3.08	1.14
Keeping up with technological changes.	2.67	1.34
Ability to learn career/technical content at a distance.	2.67	1.27
Absence of an instructor (motivation, quality of student work issues).	3.00	1.10
Isolation from other students and faculty.	3.33	1.34

Time constraints associated with job responsibilities.	3.58	1.28
My level of technical expertise.	2.54	1.38
My availability of technology (internet service, computer access, etc.).	2.57	1.41
Distance education and technology fees (increased costs associated with distance education courses).	3.67	1.27
Student support services (help with advising, admissions, financial aid, etc.).	3.21	1.44
Monetary issues (paying for courses).	3.58	1.21
Transferability of credits.	2.46	1.38
Instructor availability (students' ability to contact instructor to discuss concerns).	2.88	1.39
Obtaining grades, transcripts and other course-related records.	2.25	1.29
Completing an academic program entirely as a distance student is an advantage when applying for employment or professional education programs.	2.79	1.50

When questioned concerning the preferred method of delivery for distance education course work, one-half of the participants indicated that they preferred an asynchronous format such as BlackBoard© or WebCT© and that they did not want to view videos of the on-campus section of the class, while only one participant indicated that they preferred some type of synchronous format (Table 5).

Table 5.
Participants' Preferred Format for Distance Delivery of Course Work (N=24)

Format	*f*	%	Rank
Asynchronous e.g. BlackBoard©, WebCT©, Angel©, etc.	12	50	1
Asynchronous and video from on-campus section	10	41.6	2
Synchronous	1	4.2	3
No response	1	4.2	

Conclusions

The majority of this group of distance education adopters was female and was under 30 years of age. Although this distance education program does not differentiate between out of state students and residents in terms of tuition, the vast majority was from within the state and was completing their degree entirely at a distance. These students had been exposed to several different formats for distance delivery and the majority preferred the asynchronous experiences.

Within this group of participants, distance education holds many positive aspects, but does not appear to be the delivery method of choice. Congruent with previous research, (Kassop, 2003; Kumrow, 2007), this group of students held a high perception of the effectiveness of distance delivered courses and even agree that they learn more through distance delivery than through face to face lectures. The participants agreed that they benefited from distance course work and most planned to take future distance based courses. However, it is noteworthy that the variability of answers concerning the idea that students learn better via distance and the preference for distance courses is higher than many of the other aspects which would indicate less agreement among the group on these issues.

This study supports earlier research that showed distance delivered instruction to be gaining in popularity due to some of the benefits it presents to today's students. Benefits such as convenience, time efficiency and cost effectiveness have been previously identified as appealing aspects of distance education (Andrews & Demps, 2003; Morgenthaler, 2009). As determined in previous studies, (Filcher & Miller, 2000), the participants in this study chose distance education courses largely due to scheduling conflicts with traditional, face to face class times. Further, this element of flexibility concerning the time devoted to course work allows students with responsibilities outside the academic world to further his or her education while maintaining a balance in their home life (Gallagher, et al., 2005). However, participants were less likely to agree that distance courses saved them time.

Within this group, the inability to effectively contribute to class discussions and the difficulties associated with learning more independently, when compared with their past experience in traditional courses, appeared to be the greatest barriers to the adoption of distance courses. Participants did not agree that any issues related to their understanding of technology or the availability of such resources presented barriers to their participation in distance education.

Recommendations and Implications

Recommendations for Practice

This data supports the determination of previous researchers concerning the high demand for course work via distance education (Roberts & Dyer, 2005), and helps to refute the notion that students take distance courses because they perceive them to be easier or require less of a time commitment. The participants in this study indicated that they perceived the distance courses to be similar in rigor and quality to those delivered traditionally. Although the participants did indicate that they missed the human interaction involved with traditional course meetings, they felt that they learned just as much via distance. This would seem to indicate that much of what the student "misses" through distance education is social interaction instead of intellectual stimulation. While the two are often tied, this group of students believed that the benefits that they reaped through distance education in terms of fitting into their schedules outweighed the degree of social isolation.

This data adds to the current body of literature that describes the importance of distance educators striving to provide meaningful experiences rich with interaction among students within the realm of distance education. With new and emerging technology, distance educators must be ready to adapt to bring better forms of interaction between students and the instructor that will help to alleviate this social isolation. To this end, current technology i.e. Twitter©, blogs, Facebook©, YouTube©, and Axilior Alliance© are currently being implemented in several graduate and undergraduate courses in this program.

This study indicates that students may have developed the necessary skills for navigating technology for distance delivered courses and that their perception was that the technology itself did not pose any substantial barriers to distance education. While these findings are in conflict with previous research (Kelsey, Lindner, & Dooley (2002); Nelson & Thompson, 2005), perhaps it reflects the advances achieved over the last decade in distance delivery technology and the skill sets possessed by students.

Recommendations for Future Research

The effective delivery of distance education is ripe for research. Much is left to be understood concerning the dynamics of student and instructor relationships via distance technology. The participants in this study held strong feelings concerning their lack of ability to provide meaningful contribution to the class via distance technology. This response seems to indicate that the participants have not adjusted fully to distance delivery and the interactive components that provide opportunities for interaction in spite of the geographical separation. As recommended by Elbaum, McIntyre, and Smith (2002), courses should include community building opportunities, such as "fun ice-breaking activities in the beginning of the course and sustaining a social life for the group with a café or student lounge discussion thread where non-course topics are welcome throughout the course" (p.12). Perhaps this phenomenon alone would be a beneficial topic for further research. Previous research (Rosenshine & Furst, 1971), has shown that the interaction between students and teachers is key in the effective delivery of information. In order for distance educators to be able to achieve this type of interaction, the dynamics of their approach should be studied. In fact, previous studies have even shown that students who may struggle with traditional instructional methods may benefit from being able to be in touch with other classmates and instructors around the clock via the internet (Strickland, 2009). This would seem to indicate that this group of distance students may have simply failed to take advantage of this benefit of distance education. Perhaps this is due to a flaw in the delivery design or in the level of encouragement provided by the instructors of the courses to use the technology to interact closely with other students in the class.

What is more, the fact that the majority of participants indicated that even though their preference was face to face courses, they believed that they could learn more through a distance education course than if they were enrolled in a traditional course warrants further investigation.

Further inquiry should be made to determine specific aspects of distance delivered course work that contributes to these perceptions. Perhaps further inquiry could reveal the influence, or the lack thereof, of course delivery preference on learning outcomes.

Further, current literature has indicated that learning styles can affect the success of distance based instruction (Borich, 2004; Lupovici, et al., 2008; Strickland, 2009). Perhaps an evaluation of the learning styles possessed by the participants in this study would provide further insight into why these students hold specific perceptions concerning distance education, especially as it relates to social interaction within the classroom.

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Liberty Hyde Bailey: Agricultural Education Pioneer

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Abstract

Liberty Hyde Bailey was a pioneer in American agricultural education. Bailey studied agriculture at Michigan Agricultural College. He returned to MAC as chair of the new department of horticulture. He moved to Cornell University where he advanced to become Dean of the College of Agriculture. Bailey was instrumental in the development of horticultural science in America, the nature-study movement for elementary students, and the country life movement for all rural citizens across the country. This historical research study investigates Bailey's influence on agricultural education in the United States. Objectives were to describe Bailey's history in horticulture and higher education, his nature-study program, his work on the Commission on Country Life, and his work in agricultural and extension education.

Introduction

The profession of agricultural education has many pioneers. Ask anyone involved with agricultural education who Justin Morrill was and they will reply that he wrote the Land-Grant College Act. Most will know that Seaman Knapp developed the demonstration farm and championed extension education. Anyone who has ever been involved with 4-H will know that A.B. Graham is considered the Father of 4-H clubs. FFA members will be able to tell you that Hoke Smith and Dudley Hughes wrote the Smith-Hughes Vocational Education Act. They will be able to tell you that Henry Groseclose was one of the founders of the Future Farmers of Virginia and eventually the Future Farmers of America.

But ask most people who Liberty Hyde Bailey is and you will probably receive a blank stare. While Liberty Hyde Bailey is well known to anyone who studies horticulture in America, he is relatively unknown to agricultural education professionals. This is an unfortunate oversight for Liberty Hyde Bailey played an important role in establishing nature-study and agricultural subjects in both elementary and secondary schools in the late 1800s and early 1900s. He was the chair of President Theodore Roosevelt's *Commission on Country Life* in 1908. He wrote numerous books on production agriculture, horticulture, nature-study, the teaching of agricultural subjects, and the country life movement in the United States.

Bailey was truly an unsung pioneer for agricultural education at the elementary, secondary, and post-secondary levels of education in America. His nature-study ideas, his thoughts on agricultural education, his environmental, ethical, and moral theories, and his love of the country life and the open country should be studied and valued by every agricultural education professional. Bailey's writings from 1885 until his death in 1954 are as important and valuable today as they were over 125 years ago.

Review of Literature

Many individuals played an important role in the history of agricultural education in the United States. In their study on the great individuals and events in the history of agricultural education in America, Camp and Crunkilton (1985) identified 10 individuals who most influenced the history of agricultural education. Included in their list was Henry Groseclose, who along with Harry Sanders, Walter Newman, and Edwin MaGill founded the Future Farmers of Virginia in 1925. This eventually led to the establishment of the Future Farmers of America in 1928.

Moore (1988) called Rufus W. Stimson "the forgotten leader in agricultural education (p. 50). Moore wrote that, "In the formative years of vocational agriculture, many people were opposed to this 'new' type of education. A number of people did not view agriculture as being worthy of study" (p. 55). Moore added that, "Having a person of Stimson's background and training arguing for a balanced education, one which included vocational education, did much to advance vocational education" (p. 55).

Camp (1987) discussed the roles that Hoke Smith, Dudley Hughes, Charles Prosser, and Carrol Page played in getting federal legislation to support vocational education passed through the U.S. Congress. Camp wrote that, "There were many education, industrial, political, and other leaders advocating federal vocational legislation during the first 17 years of the 20th century...Four of the champions of such legislation were Hoke Smith, Charles Prosser, Dudley Hughes, and Carroll Page" (p. 7).

In another article by Moore (1987), he described Bailey's nature study idea when he wrote, "The forerunner of agricultural education was nature study and school gardens, primarily in elementary schools" (p. 9). Moore specifically recognized Bailey when he stated, "A leader in the nature study movement was Liberty Hyde Bailey of Cornell, who in 1896, prepared a bulletin titled *How a Squash Plant Gets Out of the Soil"* (p. 9).

A.B. Graham was another individual who played a major part in promoting agricultural education, country life, and youth leadership development. He is credited with being one of the individuals who developed the agricultural club movement for rural boys and girls which eventually lead to the 4-H clubs in most counties. McCormick and McCormick (1984) wrote that, "Like many educational leaders of the 1890s and early 1900s Graham attempted to increase the teacher's role in decision making, but he tried to do this while enhancing parent and student participation until schools became community centers" (p. 171).

Many individuals played important roles in agricultural education around the turn of the 20th century. However, no one brought as broad of experience to the issue as Liberty Hyde Bailey. Bailey was a farm boy, naturalist, educator, agricultural dean, and champion of the country life movement. This research study will identify the contributions Bailey made to agriculture, horticulture, agricultural education, and the country life for all citizens of the United States.

Purpose and Objectives

The purpose of this historical research study was to investigate the influence Liberty Hyde Bailey had on the field of agricultural education. Objectives which guided the study included:

1. Describe Bailey's history in horticulture and higher education in agriculture.

2. Describe Bailey's emphasis on nature-study for elementary school students.

3. Describe Bailey's leadership as Chairman of the *Commission on Country Life*.

4. Describe Bailey's work in agricultural and extension education.

Methods

This investigation was an historical research study. It utilized historical research methods including library and archival searches. Research was conducted at two land-grant university libraries and using on-line resources including museums and libraries. Primary sources were utilized wherever possible. Primary sources included books, papers, and speeches given by Liberty Hyde Bailey. Secondary sources included research studies of Bailey and the Commission on Country Life, and information available from the Liberty Hyde Bailey Museum and Cornell University Library. Whenever possible the researcher tried to verify information from more than one source. All references were subjected to both internal and external criticism. The researcher analyzed each document to determine its authorship and authenticity. The researcher internally criticized each document to evaluate its relation to the objectives of the study. Multiple sources were used to triangulate the information and establish the credibility of the results.

Results

Liberty Hyde Bailey

Liberty Hyde Bailey was born into a farm family in South Haven, Michigan on March 15, 1858. Bailey's father had moved to Michigan from Vermont in 1841 looking for a frontier filled with forests, prairies, and fertile farm land (Dorf, 1956). When Liberty was only a boy of 5 years of age, his mother Sarah died of diphtheria. This tragic event played an important part in his formative years.

Dorf (1956) writing a biography of Bailey wrote,

> Since young Liberty was too old to be confined to the house and yard and too young for anything more than a few light chores, the family left him largely to his own devices. He wandered through orchard, darted in and out of the new barn, which the men were sheathing with hemlock boards, and watched the tadpoles in the little swamp. Back of the

> barn was a field that his father early had cut from the forest for use as a pasture. It contained hummocks, each about three to four feet high, each an observation point from which a young explorer could view the changing landscape (p. 6-7).

Bailey grew up being influenced by the nature around his South Haven farm. He also loved to read anything he could get his hands on. Two of his favorite books were Charles Darwins *On the Origin of Species* and Asa Gray's *Field, Forest, and Garden Botany* (website). Bailey's observations of nature and his prolific reading habit led to a love of birds. When he was just 15 years old he wrote his first manuscript titled *"Birds"* which he presented before the Michigan Pomological Society and published in the Annual Report of the Society in 1873. As a result of his presentation, he was elected to serve as the ornithologist and entomologist for the South Haven Pomological Society.

In 1877 Bailey enrolled in Michigan State Agricultural College. At MAC, he became the protégé of Dr. William Beal, professor of botany and horticulture. Bailey graduated with a Bachelor's of Science degree in August 1882. After a stint as a reporter for an Illinois newspaper, he accepted a position as an assistant to Asa Grey at Harvard University. After working at Harvard, he was asked to chair the new department of horticulture and landscape gardening at his alma mater, Michigan State Agricultural College.

Bailey began teaching at MAC in 1885. He would only stay at the college for three years. In 1888 he was enticed to become the Chair of practical and experimental horticulture at Cornell University in New York. Bailey established himself as a dedicated teacher, researcher, and author at Cornell. In 1903, as a result of his quality teaching and leadership, he was named Dean of the College of Agriculture, a position in which he would remain in until 1913.

Father of American Horticulture

Bailey arrived on the American agriculture scene at a unique time in history. Agriculture was expanding rapidly after the Civil War with new innovations, production practices, and management techniques. Bailey was the first to view the use of fruits, vegetables, ornamental and nursery plants as important contributions to agriculture. He also viewed horticulture as a science and not just gardening, as many of the botanists of the day did.

Throughout his academic career, Bailey knew the importance of research and writing. He wrote is first book titled *Talks Afield: About Plants and the Science of Plants* in 1885 while teaching at Michigan Agricultural College. This was followed in 1886 by *Field Notes on Apple Culture* and many more in the years to come. A sample of his early works in the horticulture field include: *The Horticulturalist's Rule Book, Annals of Horticulture, The Nursery Book, Principles of Fruit Growing, Principles of Vegetable Gardening, The Pruning Book, Garden Making, Principles of Agriculture, and Lessons with Plants,* a book to show how teachers can teach using plants in their classrooms.

Dorf (1956) reported that "From 1889 to 1896 more than half the bulletins published by the Cornell University Experiment Station were written by Bailey (p. 74). In 1903, Bailey published his first major work, the *Cyclopedia of American Horticulture*, a 4 volume work that he edited.

Bailey's university courses, his lectures and presentations to agricultural groups around the country, his horticultural research, and his tireless publishing on agricultural and horticultural topics truly entitle him to the title of Father of American Horticulture. In a biography published in 1994, Banks described Bailey's importance to the history of horticulture when he wrote,

> "On November 5, 1990, the American Society for Horticultural Science initiated a Hall of Fame designed to "honor distinguished persons who have made monumental and unique contributions to horticulture." Only two scientists were inducted at the initiation—Gregor Mendel, the Austrian monk who solved the riddle of heredity, and Liberty Hyde Bailey" (p. 3)

Prolific Writer

While Liberty Hyde Bailey began writing as a youth, he continued to write as a college student at Michigan Agricultural College, as a newspaper reporter in Illinois, and finally as a college professor and dean at Cornell University. In the beginning his writing focused on his love of nature, agriculture, and horticulture. As was described above, he wrote numerous books on various subjects related to plants, gardening, horticulture, agriculture, and education. Bailey's writings were organized into several series of books. These series included:

Rural Life Series
Garden Craft Series
Open Country Series
Rural Science Series
Rural Text-Book Series

Table 1 below includes examples of the series books that were written by Liberty Hyde Bailey. Bailey also published what he called the Background Books. These books went beyond Bailey's horticultural topics and introduced the world to his environmental philosophy, society, politics, and ethics. The Background books included:

The Holy Earth (1915)
Wind and Weather (1916)
Universal Service (1918)
What is Democracy (1918)
The Seven Stars (1923)

Table 1

Liberty Hyde Bailey Book Series Examples

Rural Life Series		
The Outlook to Nature (1905)	The Nature-Study Idea (1903) and the Farmer (1908)	The State The Country-Life Movement (1911)

Rural Science Series (Bailey, 1909)	
Bacteria in Relation to Country Life Bush-Fruits Farm Poultry Feeding of Animals Fertilizers Forage Crops Garden Making How to Choose a Farm Irrigation and Drainage Mile and Its Products Plant Breeding Principles of Vegetable-Gardening Rural Wealth and Welfare	The Care of Animals The Farmer's Business Handbook The Farmstead The Fertility of the Land The Forcing Book The Horse The Nursery Book The Practical Garden Book The Principles of Fruit Growing The Principles of Agriculture The Pruning Book The Soil The Spraying of Plants

Bailey's environmental philosophy has proven so relevant to today's society that it was recently republished. Bailey (2008) describes his view of the holy earth when he wrote, "One does not act rightly toward one's fellows if one does not know how to act rightly toward the earth" (p. 2). Bailey goes on to describe his love of the earth by stating, "Every man in his heart knows that there is goodness and wholeness in the rain, in the wind, the soil, the sea, the glory of sunrise, in the trees, and in the sustenance that we derive from the planet" (p. 7). Describing the importance of agriculture, Bailey wrote that "A good part of agriculture is to learn how to adapt one's work to nature, to fit the crop-scheme to the climate and to the soil and the facilities. To live in right relation with his natural conditions is one of the first lessons that a wise farmer or any other wise man learns" (p. 9).

The Liberty Hyde Bailey Museum (n.d.) recognizes the author when they wrote:

> Liberty Hyde Bailey was a prodigious 20th century author, whose writing spanned eighty-one years. Bailey's name appears over 700 titles ranging from botany, horticultural, encyclopedias, poems, conservation, agriculture, democracy, education and spirituality all

of which still inform us today. More than any other person Bailey was responsible for a new American literature of horticulture.

It is clear from the volume of informational bulletins, books, poems, philosophical, and environmental articles that Bailey wrote, that he was one of the most influential agricultural educators of the 19th and 20th centuries.

The Nature Study Movement

Bailey grew up wondering around his father's Michigan farm spending countless hours observing nature. He learned to love plants, animals, trees, and bugs. As a result he became an ornithologist who's first paper was titled *Birds* (Dorf, 1956). As a result of his upbringing, one of Bailey's first major undertakings was to promote nature study for elementary students in the United States.

Bailey had already established himself as an agricultural and horticultural expert throughout New York. His idea of promoting nature study among elementary teachers and students would make Bailey a household name. Dorf (1956) wrote, "The leadership which Bailey provided in the development of the nature-study movement was to make his name as well known among elementary school teachers as among professors of agriculture" (p. 109).

Bailey worked with colleagues in the College of Agriculture at Cornell University to develop a series of Leaflets for elementary teachers that explained the nature-study movement and provided ideas for teachers to use in nature study activities. The L.H. Bailey museum (Using Bailey in the Classroom: Nature Study, n.d.) describes how Bailey developed the nature-study idea:

> Growing-up on a Michigan farm during the end of the 19th century, Liberty Hyde Bailey had a first-hand experience of nature's ability to teach scientific observation and instill a personal appreciation and an ethic of care for the landscape. Rooted in this background, Bailey along with associates at Cornell University became key figures in the founding of the Nature-Study Movement. Its aim brought children out of the classroom and into the outdoors for mini nature lessons through informal observation. Still in use today, it professes no standardization or science but only for the student to "establish a living sympathy with everything that is."

In the first leaflet Bailey (1897) wrote:

> Nature-study, as a process, is seeing the things that one looks at, and the drawing of proper conclusions from what one sees. Its purpose is to educate the child in terms of his environment, to the end that his life may be fuller and richer. (p. 11)

Bailey went on to provide more details about the nature-study idea. He wrote that, "It is informal...It trains the eye and the mind to see and to comprehend the common things of life..."

(Bailey, 1897, p. 11). He also provided some idea of what could be considered nature-study when he stated, "The proper objects of nature-study are the things that one oftenest meets. Stones, flowers, twigs, birds, insects, are good and common subjects...Plants are more easily had...although animals and minerals should by no means be excluded" (p. 11).

He also shared the reason for proposing the introduction of nature-study into the elementary curriculum. Bailey said that,

> One difficulty with our present school methods is the necessary formality of the courses and the hours...The best way to teach nature-study is, with no hard and fast course laid out, to bring in some object that may be at hand and to set the pupils to looking at it. (p. 12)

The interest in Bailey's nature-study idea continued to grow throughout the late 1890s and into the new century. Bailey continued to emphasize that nature-study should be included in all elementary schools. Every school should have a nature-study area and a garden where pupils could engage in nature-study. Writing in his book *The Outlook to Nature* (Bailey, 1915), he stated that, "I should put one acre of land as the lowest limit for a country school" (p. 127). His emphasis on using school gardens is evident in his stating, "The school-garden will do much to place the school in proper relation to its natural problems and will be an intermediate stage between the schoolhouse and the larger environment of the neighborhood" (p. 128).

Elementary school teachers were eagerly adopting the nature-study idea for introducing the natural world to their students. In 1903, Bailey finally compiled a comprehensive book to explain the nature-study movement and assist interested teachers in incorporating it into their schools. Bailey also introduced the idea of teaching nature-study though agriculture. Bailey wrote, "Children in the home and school should be interested in horticulture and agriculture as a means of introduction to nature. Farming introduces the human element into nature and thereby makes it more vivid in the child's mind" (Bailey, 1911a, p. 90).

Bailey went on to describe the importance of using agriculture for nature-study when he stated,

> All good agriculture work in the grades [elementary grades] must be nature-study. All agricultural subjects must be taught by the nature-study method, which is: to see accurately; to reason correctly from what is seen; to establish a bond of sympathy with the object or phenomenon that is studies. (p. 100).

The nature-study movement was a definite success for Bailey and the College of Agriculture at Cornell University. Dorf (1956) reports that, "By 1903 nearly three thousand grade-school teachers were receiving nature-study guidance by correspondence; nearly thirty thousand children were raising plants in school gardens" (p. 112). Bailey described the importance of the nature-study movement (Dorf, 1956) for the College of Agriculture when he wrote,

> It is trying to help the farmer and it begins with the most teachable point - the child. The district school cannot teach agriculture any more than it can teach law or engineering or any other profession or trade, but it can interest the child in nature and in rural problems and thereby fasten its sympathies to the country. The child will teach the parent." (p. 113)

The nature-study movement made Bailey a promoter of the environment, nature, and agricultural education, not only in colleges and universities, but for younger students as well. It would also introduce Bailey as a leader who was dedicated to the education and quality of life of all country folk.

Country Life Commission

Having worked in agricultural education since 1885, Bailey was well known throughout the country. In 1908, Bailey's work in education and agriculture would come to the attention of President Theodore Roosevelt. Agriculture and rural communities were suffering. Large numbers of workers were leaving farming for factory work in the cities. There was a growing concern that if the decline in rural towns continued it would result in the disaster for farming and agricultural production. To counteract this problem, President Roosevelt created the Commission on Country Life. In a letter to Bailey, Roosevelt (Commission on Country Life, 1911) wrote,

> No nation has ever achieved permanent greatness unless this greatness was based on the well-being of the great farmer class, the men who live on the soil; for it is upon their welfare, material and moral, that the welfare of the rest of the nation ultimately rests. (p. 41)
>
> How can life on the farm be kept on the highest level, and where it is not already on that level, be so improved, dignified and brightened as to awaken and keep alive the pride and loyalty of the farmer's boys and girls...How can a compelling desire to live on the farm be aroused in the children that are born on the farm? (p. 43-44)

Other noted professionals invited to serve on the Commission on Country Life included Henry Wallace of Iowa, President Kenyon Butterfield of the Massachusetts Agricultural College, and Gifford Pinchot, head of the U.S. Forest Service. Bailey was asked to chair the commission. Bailey and the other members of the commission proceeded to hold hearings around the country to listen to the problems and concerns of country citizens. They also mailed out questionnaires to rural residents to collect their opinions on a number of issues. One question in particular asked, "Are the schools in your neighborhood training boys and girls satisfactorily for life on the farm?" (Commission on Country Life, 1911, p. 51). It was reported that, "About 550,000 copies of the circular questions were sent to names supplied by the United States Department of Agriculture, state experiment stations, farmers' societies, women's clubs, to rural free deliverymen, country physicians and ministers, and others. To these inquiries about 115,000 persons have now replied..." (p. 54).

In its final report, the Commission (Commission on Country Life, 1911) expressed their feelings that there was a need for a redirection in rural education.

> The subject of paramount importance in our correspondence and in the hearings is education...Everywhere there is a demand that education have relation to living, that the schools should express the daily life, and that in the rural districts they should educate by means of agriculture and country life subjects. It is recognized that all difficulties resolve themselves in the end into a question of education. The schools are held to be largely responsible for ineffective farming, lack of ideals, and the drift to town. (p. 121).

In relation to the growing trend of teaching agriculture in schools the Commission wrote,

> The feeling that agriculture must color the work of rural public schools is beginning to express itself in the interest in nature-study, in the introduction of classes in agriculture in high schools and elsewhere, and in the establishment of separate or special schools to teach farm and home subjects. (p. 123)

The report also delved into the need for federal government support of new educational initiatives when it stated, “It will be increasingly necessary for the national and state governments to cooperate to bring about the results that are needed in agricultural and other industrial education” (p. 125). The commission also noted the growing interest in extension education across the country. It was written in the report that, “This extension work includes such efforts as...demonstration on farms, nature-study and other work in schools, boys’ and girls’ clubs of many kinds...” (p. 126).

As a result of their surveys and hearings, the commission officially recommended that “To accomplish these ends, we suggest the establishment of a nation-wide extension work” (p. 127). In the concluding statement of the Commission’s report, Bailey wrote,

> The great need everywhere is new and young leadership, and the Commission desires to make an appeal to all young men and women who love the open country to consider this field when determining their careers. We need young people of quality, energy, capacity, aspiration and conviction, who will live in the open country as permanent residents on farms, or as teachers, or in other useful fields, and who...will still have unselfish interest in the welfare of their communities. (149-150)

L. H. Bailey and Agricultural and Extension Education

Throughout his academic career and service on the Commission on Country Life, Liberty Hyde Bailey always promoted the idea of nature-study and agricultural education to improve country life. Writing in his own book titled *“The Country-Life Movement in the United States,”* Bailey (1911b) wrote,

> Agriculture is now a school subject. It is recognized to be such by state syllabi, in the minds of the people, and in the minds of most school men. It is finding its way into high schools and other schools here and there...It is now our part to define the subject, organize it, and actually to place it in the schools. We must understand that the introduction of agriculture into the schools is not a concession to farming or to farmers. It is a school subject by right. (p. 62-63).

Bailey believed that no one needed to apologize for including agricultural education into the American school system. He thought it was a good idea to extend the agricultural education that was being taught in colleges of agriculture to all citizens of rural America. Bailey (1911b) wrote,

> We are now attempting to extend this democratic education by means of agriculture to all ages of our people, and there is promise that we shall go farther in this process than any people has yet gone...and with a voice in the affairs of government, should give to the people of the United States the best country life that has yet been produced. (p. 65)

Writing in 1911, six years before the passage of the Smith-Hughes Vocational Education Act, Bailey stated, "Agriculture work is proceeding in nearly all the states under the auspices of the United States Department of Agriculture...and there is agitation for the passage of a national bill to further secondary and special agriculture-education in the states" (p. 70).

Bailey even expressed his concerns about the preparation of future agriculture teachers. Writing in his book *The State and the Farmer,* Bailey (1908) wrote, "...regular administrative departments of public instruction should handle the work of all fundamental elementary and secondary education. They will need to call on the agricultural colleges for help, especially in the training of teachers..." (p. 107). Bailey was always concerned with the public's perceptions of farm life. As a Dean of the College of Agriculture at Cornell University he surveyed students about their perceptions of farm life. In his book *The Training of Farmers* (Bailey, 1910) described the problem by writing,

> ...farm life is not made attractive for the boys. Many of them have very little education, and their life is to them merely hard drudgery from early morning to late at night, with only a bare living as a return...With the increase of agricultural education and betterment of conditions in the country, I believe this will change. The young men will come to see the brighter side of farm life, and the attractions and advantages in staying on the farm. (p. 98)

Bailey also shared that he thought that agriculture should be incorporated into all education not just taught as a stand-alone vocational subject. Bailey indicated that,

> When these objects, phenomena and activities are agricultural (as they are in a rural community), then agriculture becomes a means of education, but it is not agriculture in the sense of a specialty leading directly to the occupation of farming. That is to say, in such

cases agriculture (which is the sum of the community life) becomes the real backbone and motive of the school. Other subjects grow out of it and are picked up with it as the school life proceeds. (p. 151).

Conclusion

Liberty Hyde Bailey was truly a pioneer of agricultural education in America. From 1885 when he enrolled in Michigan Agricultural College to his retirement as Dean of the College of Agriculture at Cornell University, he spent is entire life working in horticulture, agricultural production, agricultural and extension education (Peters, 2006), nature-study, and the country life movement. His development and promotion of nature-study leaflets and books for elementary teachers and students was the forerunner of agricultural education in elementary and secondary schools. It introduced thousands of students to the importance of nature and lead many to study nature, the environment, and agricultural education in secondary schools.

Bailey was recognized for his work in horticulture and rural areas when President Roosevelt asked him to chair the Commission on Country Life in 1908. His pioneering work with this important commission is still being discussed and debated over 100 years after its inception (Peters & Morgan, 2004).

A biography of Bailey on the Liberty Hyde Bailey Museum website (n.d.) provides the following description of this magnificent individual:

> "Liberty Hyde Bailey was an American polymath. His work during the 20th century impacted so many areas of study that it is difficult to assign Bailey a singular historical role. A naturalist at heart, Bailey's childhood passion for learning the living world around him brought acclaim for his visionary work in Botany, Education, Environmentalism and Horticulture."

Recommendation

Based on the results and conclusions of this study, the researcher recommends that the writings of Liberty Hyde Bailey be infused into elementary, secondary, and postsecondary instruction in education, horticulture, agriculture, and agricultural education. Bailey's philosophy on environmental stewardship should be studied by every student in colleges of agriculture at land-grant colleges. While Bailey's writings have long been recognized in the horticultural field, he has not been as well known in other areas of agriculture. Bailey's book *The Holy Earth* (Bailey, 2008) has recently been republished; other books by the scholar should be added to the reading libraries of secondary agricultural education programs and agricultural courses a land-grant universities. Bailey's idea of nature-study for elementary students should also be reconsidered. In this era of reduced budgets and lack of quality educational facilities, Bailey's theory of using nature to stimulate children's imagination should be revised.

Liberty Hyde Bailey was one of the most important writers, educators, and scholars in the history of agriculture in the United States. While he is remembered as the father of modern horticulture, his life consisted of much more than just plants. He loved all parts of nature and the country life he so embraced. He should be remembered along with other noted individuals, as one of the pioneers of agricultural education in the United States.

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The History of Future Farmers Around the World

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Abstract

The establishment of the Future Farmers of America in 1928 and its subsequent growth in size and scope was noticed around the world. Agricultural education professionals from dozens of other countries wanted to know about the organization and how it helped motivate young rural boys to study vocational agriculture and choose agriculture as a career field. Over the course of several decades, many countries started their own "future farmer" organizations. The most successful was the Future Farmers of Japan which is a large and vibrant organization to this day. As the FFA grew, so did its involvement in international activities. The FFA has worked with many other countries to offer exchange programs, study tours, and travel seminars for state FFA officers, award winners, and national FFA officer teams. The FFA has also offered Work Experience Abroad, World Experience in Agriculture, and the World AgriScience Studies Programs. This historical research study investigated future farmers organizations in other countries, the history of FFA international activities, and study tours and travel seminars for award winners and FFA officers.

Introduction

The Future Farmers of America organization has been involved in international activities since it was established in 1928 (Tenney, 1977). Even before the FFA was founded, American agricultural education professionals were traveling to remote corners of the world to offer advice and recommendations on agricultural education and youth development to other countries (Allen, 1939; Dickinson, 1947). As the Future Farmers of America grew in size and scope, agricultural educators from around the world took notice of the impact the organization was having with rural agricultural youth in the United States.

Government officials, agricultural educators, and international development organizations began contacting the Future Farmers of America to find out details about FFA programs, activities, and events. So many countries were contacting the FFA that the organization developed a brochure titled "The Future Farmers of America: What it is, What it does" (Future Farmers of America, n.d.) that was printed in English, Spanish, Portuguese, and German. Educators around the world were realizing how future farmers clubs could be used to organize and motivate youth to study agricultural education and enter the field of agriculture.

Over the period of several decades, numerous other countries established "Future Farmer" organizations for their youth. In many countries the name "Future Farmers of..." was used. In other countries different names were used for youth agricultural education clubs. No matter what final name was selected, similar symbols, rituals, skill development events, and leadership development activities were included in these organizations. This study investigated the Future Farmers of America's long history in international agricultural education activities, including the establishment of Future Farmers clubs in other countries around the world.

Theoretical Framework

Agricultural education professionals from the United States have been working in other countries for decades. Sherman Dickinson was the Chief of Party in Brazil Cooperative Agricultural Program in the late 1940s. Writing in *The Agricultural Education Magazine*, Dickinson (1947) stated,

> Our program in agricultural education is attempting to cooperate with the Brazilian Ministry of Agriculture in developing plans whereby the agricultural situation may be improved. It has been agreed that this may be best accomplished by means of increased educational opportunities for rural peoples, emphasizing training in practical agriculture. (p. 237).

The Future Farmers of America wasn't the only organization of interest for other countries. The 4-H youth clubs were also involved internationally since their development in the early 1900s. Smith and Kirkpatrick (1990) reported that "Long before the International Farm Youth Exchange (IFYE) program was initiated in 1948, the 4-H movement in America had won the interest and respect of several foreign nations" (p. 150). The authors also reported that, "As early as the 1920s and 1930s, Canada, England and a few other countries set out to develop similar youth groups" (p. 150). Over the next decades, 4-H clubs were established around the world. Smith and Kirkpatrick wrote that,

> By the late 1940s, South Korea had established a 4-H type program with some 3,729 clubs and 142,500 members. And in 1949, Austria launched a program similar to 4-H as part of the Marshall Plan. By 1953, 23 countries in Asia, Europe and Latin America had 4-H type clubs. (p. 150).

Reck (1951) described the beginning of 4-H clubs in Denmark by stating, "Denmark had been working with rural young people since 1913, when agricultural societies organized farm boys into groups to receive technical instruction" (p. 221). Denmark made arrangements to host a USDA extension specialist to assist in establishing 4-H clubs. Meetings were held throughout 1923-24 and "club work actively started in the spring of 1924" (p. 221). Rank reported that, "They adopted the four-leaf clover and the four *H's*, the letters in this case standing for *Hoved, Hjerte, Haand,* and *Helbred*, the Danish words for head, heart, hand and health" (p. 221).

The issue of educating rural youth in developing countries is one that is not new in international development. Finley and Price (1994) wrote that "rural young people is another group that had received too little attention in agricultural extension programs. Millions of young people living in rural areas are a significant and untapped resource" (p. 238). The authors went on to write that, “Rural youth has a widespread need for practical training in agriculture...special efforts are needed in agricultural education, extension education, and training to include a higher proportion of rural young women” (p. 238).

When the Soviet Union occupied the Baltic State of Lithuania in 1940, they closed the long established Lithuanian Chamber of Agriculture and its affiliate Lithuanian Young Farmers Circles Union. The Lithuanian Chamber of Agriculture was originally founded in 1926 (Lithuanian Chamber of Agriculture, n.d.). The mission of the LCA is to be the main supporter of the viability of rural society and raise a strong, motivated and independent person, able to develop a competitive agriculture and to maintain safe and attractive living environment. According to Edwards, Thuemmel, and Kisieliene (2000), “In February 1989...a conference of young farmers was held at which time it was decided to ‘restore’ Young Farmers’ Circles in Lithuania” (p. 18)

Throughout the late 1980s and early 1990s, there was a strong emphasis on incorporating international agriculture concepts into secondary agricultural education curricula in the United States. In 1989, Martin wrote about the global perspective for agricultural education. He suggested that agriculture students should get involved in the Work Experience Abroad program, teachers should be involved in travel/work experience overseas, and that agriculture teachers should develop an exchange system with a school in another country.

In another article, Martin (1993) wrote a rationale for internationalizing agricultural education. His selected activities to internationalize agricultural education programs included a recommendation that FFA should “help establish/enhance youth organizations in other countries” (p. 21). He also suggested that the FFA develop youth leadership camps in other countries around the world. Martin concluded by stating, “There is a tremendous international frontier waiting for development of programs modeled after agricultural education/FFA as we know it in the U.S.A.” (p. 22).

Writing about the need for rural youth development around the world, Lindley (1989) stated, “Youth activities and competitions at the national, regional, and international level are almost non-existent in the developing countries. Support and promotion of international youth exchanges among developing countries would provide opportunities for leadership development for rural youth” (p. 13)

Lindley gave several examples of youth components in rural development programs including:

> The organization and guidance of rural youth for leadership development, skill training, service and production purposes. This includes the formation of youth clubs such as 4-H in the USA, Tani Tasuna (future farmers groups) in Indonesia, Anak Bukid (farm youth clubs) in the Philippines, rural youth clubs in South Korea, 4-S in Swaziland, 4-K in Kenya through the agricultural extension services.” (p. 14)

Agricultural education professionals in the United States, have been involved in international activities for almost a century. They have worked in distant countries to develop their agricultural education systems. They have worked to infuse leadership development activities for rural youth in poor, developing countries, and they have worked to incorporate international agricultural concepts into domestic agricultural education curricula. The establishment of future farmers clubs in other countries is just one way that American agricultural education has worked to improve agricultural education and youth leadership development around the world.

Purpose and Objectives

The purpose of this historical research study was to document the history of future farmers organizations around the world. Specific objectives which directed the study included:

1. Document the interest in, and establishment of, future farmers youth organizations in other countries.

2. Describe the history of international activities within the National FFA Organization.

3. Describe the history of the international travel seminars for National FFA Officers, state FFA officers, and national award winners.

Methods

This study was a historical research investigation. The researcher utilized historical research methods to address the purpose and objectives of the study. Research was conducted at the National FFA Archives at Indiana University ~ Purdue University, Indianapolis, at land-grant university libraries, and departments of agricultural education libraries. Whenever possible, primary sources were utilized. Primary sources included magazine articles, journal articles, meeting notes, and personal communications in the form of original source letters available at the National FFA Archives. Secondary sources of information included books, convention proceedings, and periodical articles.

In every case, the researcher exposed the historical documents to internal and external criticism to determine their value in addressing the objectives of the study. The researcher also attempted to triangulate information from several sources, both personal notes, minutes, and secondary reports of activities. One limitation of this study was the inability of the researcher to determine the current status of future farmers youth organizations in other counties. This objective, which would provide valuable information, was unfortunately outside the scope of this study.

Results

Shortly after the FFA was organized, agricultural educators, FFA advisors, and members began traveling the world to promote youth development through Future Farmers clubs. In a summary report on International Programs (Tenney, 1977), it was written that,

> Some pioneering work was done in many countries, including Albania, Greece, Egypt, India, Korea, Thailand, Taiwan, Japan, Philippines, South Viet Nam, Honduras, Canada, South Australia, Peru, Columbia, Brazil, and Mexico. (p. 119)

The National FFA Archives contains hundreds of letters from government officials, educational professionals, and community organizations from around the world requesting information about the FFA. The following is a sample of some of the countries from which letters were received:

- Bavaria (Germany)
- Brazil
- Ceylon (Sri Lanka)
- Cyprus
- Denmark
- France
- Germany
- India
- Ireland
- Israel
- Malaya
- Morocco
- Philippines
- Sweden
- Trinidad ~ Tobago
- Uruguay

Future Farmers of Greece

In 1935, Adams reported that the Future Farmers of Greece was currently being organized in the Mediterranean country. The American Near East Foundation was working with the Greek government to develop a youth organization. Adams wrote that,

> Consequently, the first 'Future Farmers of Greece,' organization had its beginning. A national chapter was written up by the supervisors of the Near East Foundation work, and presented to the Greek courts for approval in accordance with Greek law. By the end of 1933, two chapters had been organized and some experience gained in developing rounded out long-time programs of work. (p. 190)

Adams reported, "In 1934, five new clubs were organized making a total of seven chapters, with an enrollment of 140 boys" (p. 190). The FFG chapters "organized its yearly programs along four lines - recreation, agriculture, cultural improvement and health sanitation" (p. 190).

At the 11th Annual National FFA Convention in October 1938, Dr. H. B. Allen (1939), Director of Education for the Near East Foundation, delivered an address titled "Future Farmers in Other Lands." Allen stated, "I bring you greetings and best wishes from the Future Farmers of Greece, the Future Farmers of Bulgaria, and the Progressive Farmers of Albania" (p. 236). Allen expressed his thanks to the Future Farmers when he stated, "In developing your fine organization during the past 11 years, you, and others before you, have built much better than you knew; the influence of your high ideals and sound principles is much wider than you realize" (p. 236).

Future Farmers of Japan

Immediately following World War II, America was actively involved with rebuilding the country of Japan. Efforts were being made to improve the educational institutions across Japan. In order to improve agricultural education programs, the Future Farmers of Japan was created in 1950. Tenney (1977) stated,

> George Lewis, former national president of the FFA, made a report at the 1951 FFA

> convention on his visit with the Future Farmers of Japan. It was reported that Ivan Nelson, a former teacher of vocational agriculture attached to General MacArthur's staff in the Army of Occupation, had been influential in the development of the Future Farmers of Japan. (p. 119 & 120).

Meaders (1985) reported that the FFJ, "...continues as a strong youth organization for boys and girls who are students of vocational agriculture. Its three goals of leadership, social character, and scientific character have provided a focus for promoting agricultural education" (p. 11).

Future Farmers of Canada

Immediately following World War II, agricultural education was expanding rapidly in Canada as in the United States. The Future Farmers of Canada organization was created in January 1947. One of the first chapters of the FFC was the Creston Valley chapter from Creston, British Columbia. The National FFA Archives contains copies of the FFC Creed and Bylaws. Figure 1 below contains the Creed of the Future Farmers of Canada.

Creed of the
Future Farmers of Canada

I believe in the future of farming and that life on a farm is both honorable and satisfying.

I believe that success in farming comes through a scientific attitude, efficiency, hard work and determination.

I believe in being a good citizen...honest and fair in all my dealings.

I believe in accepting responsibilities and doing my part in my home, school and community.

I believe that serving my country, helping others, and doing my best in my vocation will lead to a happier, fuller life.

Figure 1. Creed of the Future Farmers of Canada

The Future Farmers of Canada adopted a crest as its emblem. The crest consisted of a tree, a plow, a maple leaf, and the sun. The tree symbolized growth, the plow labour in agriculture, the maple leaf represented Canadian heritage, and the rising sun represented the future. The FFC included three degrees; Farmhand (bronze), Chapter Farmer (silver), and Provincial Farmer (gold). According to Tenney (1977), "The Future Farmers of Canada sent representatives to the national FFA conventions in 1952 and 1953" (p. 120) and in 1954 the Canadian Ambassador to the United States was a speaker at the convention.

Future Farmers in Southeast Asia and the Pacific

The Future Farmers of the Philippines was established in 1953. Many of the components of the

FFP were adopted from the Future Farmers of America. In a letter to the Supervisor of Agricultural Education in the Philippines (Tenney, A.W., 1950-1957, Tenney to A.G. Matela, March 7, 1949) Tenney wrote, "This is to advise that you have our permission to use the materials in our Official Manual and other items which may be appropriate for you to use in the Philippines. We can see no objection to your using these since your organization will be the Future Farmers of the Philippines."

FFP officers include the President, Vice President, Secretary, Treasurer, Press Relations Officer [Reporter], Sergeant-at-Arms [Sentinel], and Advisor. The emblem of the FFP is shown in Figure 1 below. It includes eight symbols including rising sun, plow, owl, crop, and flag which are similar to symbols on the FFA emblem. It also includes the words Future Farmers of the Philippines, FFP, Vocational Agriculture and 1953, the year FFP was founded. The degrees of membership in the FFP are Greenhand (bronze), Chapter Farmer (silver), District Farmer (gold pin), Filipino Farmer (gold key). The organization also had the Master Filipino Farmer of the Year, Honorary Chapter Farmers, Honorary Filipino Farmers, and Collegiate FFP members.

Figure 2 below contains the emblem of the Future Farmers of the Philippines. Table 1 lists the emblem symbol, the office it represents and the description of the symbol's meaning.

Figure 2 Future Farmers of the Philippines Emblem

Table 1

Future Farmer of the Philippines' Emblem Symbols and Their Meaning (FFP, 1959)

Emblem Symbol	Associated Office	Description
Rising Sun	President	Progress, skills, enlightenment and the token of a new era in agriculture, brotherhood, and cooperation.
Plow	Vice President	labor, industry and tillage of the soil as well as agriculture which is the basic industry of the Filipino people.
Rice and other crops	Secretary	Wealth and economic stability of the nation
Picture of Jose P. Rizal	Treasurer	National unity because as a patriot and as a farmer he kept accurate records of his business and his activities to guide his countrymen.
Filipino flag	Press Relation Officer (Reporter)	Loyalty and unity of purpose
Head of a Carabao	Sergeant-at-Arms	Strength of the nation and the national scope of the organization.
Owl	Advisor	Knowledge and time-honored wisdom
Book with Torch	--------	Learning and the records of achievements of the nation

The *Future Farmers of Australia* was probably established in the early 1950s. In October 1950 Tenney (Tenney, A.W., 1950-1957, Tenney to A. R. Ninnes, October 24, 1950) wrote to the Advisory Teacher of Agriculture at the South Australia Department of Agriculture, stating, "It would not be a difficult undertaking to organize the Future Farmers of Australia. The first step would be to study the official manual of our organization and revise it so that it would meet your needs." In a subsequent letter (Tenney, A.W., 1950-1957, Tenney to A.R. Ninnes, July 10, 1953), Tenney wrote, "We are very glad to learn of the development and growth of the Future Farmers of Australia. It is significant that you are holding a State Convention the first week of September" [1953]. In late 1955, a high school principal in American Samoa requested permission to establish an FFA chapter. Tenney (Tenney, A.W., 1950-1957, Tenney to M.J. Senter, December 30, 1955) wrote that,

> ...the Future Farmers of America organization is composed of high school students who are studying vocational agriculture in the public schools of the United States. For that reason, the students enrolled in high school in Samoa will not be eligible to take part in contests sponsored for and by the Future Farmers of America.

Tenney explained that,

> The Congress of the United States extended our program a few years ago that made possible a working relationship with Hawaii [not yet a state] and Puerto Rico. We are not in a position to assist you officially until the authorization is given by the Congress to extend the program to Samoa.

Tenney even suggested that, "If you wish to organize the Future Farmers of Samoa, we shall be very glad to provide complimentary copies of appropriate literature for you to use."

At the same time interest was expressed by vocational agriculture teachers on the island of Guam to establish Future Farmers chapters. In 1956, Tenney (Tenney, A.W., 1950-1957, Tenney to H.P. Adelbai, December 19, 1956) wrote that "I am interested to learn in your letter of November 29, that you want to form a chapter of the Future Farmers of America on Guam. I regret to advise that at the present time the vocational agriculture department in Guam is not qualified to have an FFA chapter that can affiliate with the national organization." This was because at that time the National Vocational Education Act did not include Guam.

Future Farmers in Africa and the Middle East

The National FFA Archives includes letters referencing the *Future Farmers of Liberia* (Tenney, A.W., 1950-1957, Tenney to F.B. Sands, March 14, 1955), the *Young Farmers of South Rhodesia* (Tenney, A.W., 1950-1957, Tenney to D. E. Baker, May 19, 1952), and the *Future Farmers of Israel* (Tenney, A.W., 1950-1957, Tenney to M. Aloni, October 26, 1955). Letters indicate that a chapter of the Future Farmers of Israel was established at Givat Ada. Letters were also found from officials in Iraq in reference to future plans to create "an appropriate youth organization in the field of agriculture" (Tenney, A.W., 1950-1957, Tenney to J. H. Lintner, June 5, 1957). Other documents were found that referred to the Future Farmers of Egypt but no additional information about this organization was located.

Future Farmers in Central and South America

Several future farmers organizations were established in Central and South America. The Future Farmers of Panama was established in 1955. The official name of the organization is Asociacion Nacional de Futuros Agricultores de Panama. In 1960 E.J. Johnson, Program Planning Specialist in the U.S. Agricultural Education Branch, visited Peru to help officials develop the Future Farmers of Peru. The FFP even received permission from the FFA to have the official FFA manual translated into Spanish for the use of its members (Tenney, A.W., 1950-1957, Tenney to J. G. Coombs, April 7, 1955).

The agenda for the Committee on International Educational Activities for the Future Farmers of America (1967) meeting included references to the Future Farmers of Mexico, Future Farmers of Colombia, the Future Farmers of Peru, and the Future Farmers of Costa Rica. The committee recommended to "develop guidelines to outline how the FFA would be used to supplement agricultural education programs in other countries, and recommended conducting a "World FFA Seminar" in 1970 (Future Farmers of America, 1967).

International Programs

In 1947, the National FFA Officers invited Lord Inverchapel, Ambassador from Great Britain to address the national convention (Tenney, 1977). Accompanying him on his trip to Kansas City were six members of the National Federation of Young Farmers Clubs of Great Britain. At the same time six FFA members traveled to Britain for a tour. This led to the development of an international exchange program between the two organizations.

It was reported in the *FFA at 25* booklet (Farrar, 1956),

> One of the convention activities was the approval of a plan for establishing an annual exchange program between the FFA and the Young Farmers Clubs of Great Britain. Four Future Farmers made the trip to Britain in 1949 and four British Young Farmers came to this country. (p. 41)

This exchange program continued for many years. In the history book *Blue Jackets Gold Standards* (National FFA Organization, 2003), it was stated that, “Two 18-year-olds represented FFA in the organization’s British Exchange Program in 1953. David Boyne, Marlette, Michigan, and L. Philip Brouillette...Richford, Vermont, spent four summer months that year in Great Britain visiting in homes of young farmers” (p. 26).

In 1963, the FFA contracted with the Peace Corps to sponsor agricultural development projects in West Pakistan. A.W. Tenney traveled to West Pakistan in 1965 to observe the projects and meet the FFA members who volunteered to spend two years working in the country (Tenney, 1965). Building on the FFA’s success with exchange programs, the FFA Work Experience Program was developed in 1969. This program would later be called *Work Experience Abroad,* and *World Experience in Agriculture*. Other international activities in which the FFA participated included the *Congress/Budestag Exchange Program* in West Germany, and the *World AgriScience Studies Program* (“Making the Grade Across the Ocean,” 1988).

Throughout the 1960s and 1970s FFA involvement in international agricultural education continued to grow. Joe Martinez, 1968-69 National FFA Vice President, journeyed to Cali, Columbia to represent FFA at the 1969 National Convention of the Future Farmers of Columbia. Martinez’s (1969) speech included the following passage,

> It was interesting to me to note that your liberator, Simon Bolivar, whom you regard as the Father of your nation is symbolic of the Treasurer’s post in the FAC, just as George Washington, the Father of our nation is symbolic of the FFA Treasurer. Your reference to Bolivar and the respect you show your country and its leaders is indicative to me that the FAC like the FFA seeks to encourage patriotism for country and fellow man.

In 1973, Lennie Gamage, former National FFA Officer, and Director of FFA International Programs, traveled to Australia to deliver the keynote speech titled “FFAustralia” to the 1973 convention of the Future Farmers of Australia. In 1974, H. Nevil Hunsicker traveled to Medellin, Columbia to deliver a speech titled “The Role of Vocational Agriculture and Future Farmers Programs in Rural Development” to the First General Meeting of the Committee on

Interamericano de Educacion Agricola.. On the same trip Hunsicker gave another speech titled "The Role of Student Organizations in Vocational Agricultural Education" to the 5th National Convention of Futuros Agriculturoes de Columbia.

International Travel Seminars

Throughout the 1960s and 1970s, the FFA began offering international study tours to Central and Eastern Europe, Australia and New Zealand, Central and Northern Europe, and South America. In the early 1970s, Lennie Gamage, offered study tours to New Zealand, Thailand, the Philippines, Iran, Japan and Korea. The first World Conference in Agricultural Education for Youth and Adult Leaders was held in conjunction with the 1976 National FFA Convention. One of the major activities of the conference was the First International Agricultural Olympics "consisting of individual competitive activities in soil and plant judging, agricultural mechanics, tractor operation and maintenance, and livestock judging" (Tenney, 1977, p. 124).

In 1978-79, the national FFA organization created the Proficiency Travel Seminar for the finalists and winners of the national FFA Proficiency Awards. The first seminar took place in March 1979. Countries visited over the years included England, France, Belgium, Luxembourg, West Germany, Liechtenstein, Austria, Hungary, Italy, Switzerland, Czechoslovakia (later the Czech Republic and Slovakia), Poland, Sweden, Finland, Denmark, the Netherlands, and Ireland. In the late 1980s, the FFA developed the Stars on Tour program (Mattics, 1988). It included the finalists for the Star Farmer of America and Star Agribusinessman of America. These two travel seminars were eventually combined to include both the star finalists and the proficiency finalists. In 1999, the FFA established the International Leadership Seminar for State Officers. This trip introduces State FFA Officers to international agricultural production and leadership development opportunities in Europe.

Eventually, state FFA associations and local chapters began participating in international programs. In the early 1990s, several chapters from across the country participated in the Russian exchange program with agricultural schools in the Russian Federation (former Soviet Union) (Zillinger, 1995). Six Pennsylvania FFA members from the Williamsburg chapter participated in a six-month Poland Exchange Program in 1994 (Bruce, 1995).

Throughout the decades, the National FFA Officers also got a chance to experience international agricultural education. The National Officer Good Will Tour to visit FFA Foundation Sponsors began in 1947. In the 1980s this trip was expanded into the International Experience Tour for National Officers and included a trip to Japan sponsored by Mitsui & Company, a major Japanese trading company. The 1989 National Officers tour traveled to Japan, Thailand, and China. "The officers also met with members of the Future Farmers of Japan and the Future Farmers of Thailand ("West Meets East," 1989, p. 12).

Conclusions and Recommendations

The establishment of the Future Farmers of America in 1928 and its subsequent growth in size and scope was noticed around the world. Agricultural education professionals from dozens of other countries wanted to know about the organization and how it helped motivate young rural boys to study vocational agriculture and choose agriculture as a career field. Over the course of several decades, many countries started their own “future farmer” organizations. The most successful was the Future Farmers of Japan which is a large and vibrant organization to this day. As the FFA grew, so did its involvement in international activities.

Based on the results of this historical research study, it can be concluded that the Future Farmers of America organization played a vital role in helping to establish similar “future farmer” youth organizations in numerous countries around the world.

The FFA has worked with many other countries to offer exchange programs, study tours, and travel seminars for state FFA officers, award winners, and national FFA officer teams. The FFA has also offered Work Experience Abroad, World Experience in Agriculture, and the World AgriScience Studies Programs. This research found that international agricultural education activities have been a major component in the 82 year history of the Future Farmers of America and the National FFA Organization. FFA leaders, staff, national officers, advisors, and members have traveled the world to offer assistance, gain valuable international work experience, or study agricultural production, policy, and culture in numerous countries in every corner of the globe.

Based on these conclusions, the researcher recommends that a comprehensive assessment of world wide agricultural education programs should be conducted. This should include a up-to-date documentation of agricultural youth organizations such as future farmers and young farmers clubs. The National FFA Organization should reconstitute the Committee on International Educational Activities. It should work to consolidate all information about agricultural education/FFA involvement in international agricultural activities and make regular reports to the National Association for Agricultural Education (NAAE), American Association for Agricultural Education (AAAE), the National Association of Supervisors of Agricultural Education (NASAE), and at National Ag Ed Summit meetings. The National Council for Agricultural Education should work with FFA International Activities officials to organize and lead a revised emphasis on international agricultural education and future farmer organizations for the youth of the world.

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Making the Jump: The Meaning Minority Students Ascribe to College Major Choice

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Abstract

The purpose of this study was to understand the reasons students of an ethnicity other than White, made the decision to pursue a career in agricultural education. A phenomenological approach was utilized to understand the thought processes of minority students when choosing whether or not to major in agricultural education at the collegiate level. From the findings, it was noted that minority students have external and internal value orientations toward college major choice. The findings also revealed several barriers to selecting agricultural education as a college major. The themes that emerged from provided insight into how minority students select their academic career major in agricultural education.

Introduction/Theoretical Framework

The population of the United States continues to grow and expand into a diverse cultural mosaic (Census, 2008). In 2008, the United States Census Bureau (USCB) issued a report detailing population predictions by ethnicity from 2010 to 2050. The USCB reported the White population to have the lowest increase at 1.3% of 2.48 million people over a 40-year time-period. The USCB further described that the largest predicted population increase to be the Hispanic population with a 62.5% increase translating to 83 million people. The Asian population was predicted to increase 32.2% or by 19.3 million people. Finally, the African American population was predicted increase by 28.8% or by 10.7 million people.

Public schools in the United States (US) are expected to mirror this dramatic change in the ethnic composition as well (Diller & Moule, 2005). However, the ethnic diversity of teachers within US schools is not reflective of the student population. In 2009, 6.9%, or nearly 234,000 teachers in were African America. Yet African American students comprised 15.7% of the total enrollment in secondary schools (Coopersmith, 2009; Keigher, 2009). To further exacerbate this problem, the population of African American teachers has decreased over the past ten years, and is expected to continue to decline (National Center for Educational Statistics, 1991). Other ethnic groups mirror this problem. For example, the total Hispanic student enrollment in public and private secondary schools in 2009 was 23.8%, while the total population of Hispanic teachers was 7.1%. Asian students comprised 4.4% of the enrollment in schools while Asian teachers represented 1.2% of all teachers in secondary schools. Conversely, the White student population enrolled in secondary schools represented 58.2% in 2009, which is down from 69.6%. White teachers, on the other hand, represented 83.3% of the teacher population in secondary schools (Coopersmith, 2009; Keigher, 2009).

The lack of minority teacher representation exists within agricultural education as well. In a study of the 2005 preservice agriculture teacher population, 93.4% (n = 198) were reported to be White non-Hispanic, followed by 2.4% Hispanic (n = 5), 1.4% (n = 3) African American and 0.9% (n = 2) Asian (Rocca & Washburn, 2008). It stands to reason that this trend will continue due to the fact that 95% of all teacher education students regardless of discipline area come from rural and suburban areas; which subsequently represent a majority of the White non-Hispanic population (Dilworth, 1989). Current literature reporting the ethnic graduation rate of teachers among agriculture education departments further supports the prediction that an overwhelming majority of the ethnic composition of agriculture teachers will continue to be White (Kantrovich, 2007; Rocca & Washburn, 2008).

While it can be argued that White teachers can teach non-White students, and vice versa, research has indicated that the representation of minority cultures in education promotes social change and improves the life circumstances of minority students (Joint Center for Political Studies, 1989). For example, African-American educators have been noted to be the largest group of professionals to provide leadership within the African-American community (Franklin, 1990). Minority students characterized as at risk benefit the most from relationships with minority teachers (Southern Education Foundation, 1990). Furthermore, research indicates that children of color need role models of color (Martinez, 1991; King, 1993). For example, when controlling for student and teacher ability, students of color scored higher on an economic literacy test with the presence of an African-American role model in the classroom (King, 1993b).

Research in school-based agricultural education, provides further evidence pointing to low minority enrollment in agriculture classrooms. First, minority agriculturalists have been identified as key role models in helping minority students overcome stereotypes about agricultural sciences (Larke & Barr, 1987). It could be that low minority enrollments in agricultural education are connected with an absence of minority role models in agricultural professions in general. Further, research in secondary agricultural education programs has indicated that students of various races scored differently in the areas of 'need for achievement', 'need for affiliation', and 'need for power' (Turner & Herren, 1997). It could be that minority students perceive that their needs are not being met in agricultural classrooms. Other factors, such as negative perceptions of agricultural sciences, perception of job availability for minorities in agriculture, lack of knowledge regarding the opportunities available, negative perceptions regarding advancement (Jones & Bowen, 1998; Shipp, 1999; Jones & Larke, 2001) and the FFA-NFA merger in 1965 (Bowen, 2002) have all been noted as a contribution to a deficiency of minorities in agricultural education.

School-based agricultural education programs form a recruitment channel for enrollment in agricultural education at the collegiate level. Specifically within the minority recruitment literature, school-based agricultural education programs in urban settings with high minority enrollments have also been affiliated with high numbers of minority students that successfully transition to college (Esters & Bowen, 2005). Research has also called for a need to focus recruitment and retention efforts for minority students in rural school-based agricultural education programs as an avenue to increase minority enrollment in agricultural education at the postsecondary level (Jones & Bowen, 1998). Given that most school-based agricultural education programs are in rural and suburban areas with a low population of minorities in the first place, research has noted that a number of other strategies must be employed to increase minority enrollment in post-secondary agricultural education (Oliver & Etcheverry, 1987; King, 1993; Esters & Bowen, 2005).

Colleges of Agriculture and related sciences across the nation are acknowledging the absence of minority students by implementing strategies to increase awareness, engagement, and understanding of the opportunities available for minorities at the postsecondary level. Youth organizations, such as Minorities in Agriculture, Natural Resources, and Related Sciences (MANRRS), are described as successful routes to increase participation, provide recruitment possibilities and gain success in recruiting and retaining minority students at the post-secondary level (Talbert, Larke, & Jones, 1999). However, research on minorities in agriculture and/or agricultural education at the postsecondary level that attempts to glean a deeper understanding of the minority student perspective is limited. Parent education level, parent income level, father's employer, substantive early exposure to college, and a knowledge of career opportunities have been noted to help explain why minority students enter an agricultural career path (Talbert & Larke, 1995; Turner & Herren, 1997; Jones & Bowen, 1998; Terry, 1999; Jones & Larke, 2001; Esters & Bowen, 2004; Esters & Bowen, 2005, Anderson & Kim, 2009). Agricultural education as a discipline experiences a "double-hit" so to speak in terms of minority recruitment due to the barriers associated with recruiting minorities in to agriculture as well as the barriers associated with recruiting minorities into teaching. Research describing the factors related to an absence of minority teachers in general include: 1) *The decline in the number of college students declaring teacher education majors; 2) The decline in minority college students; 3) Widening career options for minorities, especially females; and 4) The institutionalization of teacher competency tests* (Irvine, 1988).

As evidenced by the aforementioned literature, agricultural education is faced with a great challenge associated with recruiting minority students and offering them the appropriate incentives to retain them in the teaching profession (King, 1993a). While literature points toward some specific barriers to minority recruitment, the majority of that literature is descriptive-quantitative in nature, and does not attempt to gain a deeper perspective of the reasons *why* minority students select particular career paths over others. Given the multitude of barriers associated with minority recruitment, why would minority students pursue a career in agricultural education? A deeper understanding from the perspective of the minority student as they make a choice to enter a particular major in college is warranted.

Self-Determination Theory

Ryan and Deci (2000b) define self-determination theory (SDT) as a macro-theory of human motivation concerned with the development and functioning of personality within social contexts. In other words, the theory focuses on the degree to which human behaviors are selected based on internal inducements (i.e. intrinsic motivation), external inducements (i.e. extrinsic motivation), or the absence of an inducement (i.e. amotivation). Individuals make their selections by determining how engaging in a task will fulfill three basic psychological needs of *autonomy* (self-rule), *competence* (cognitive growth), and *relatedness* (emotional bonding). Thus, a minority student might choose to major in agricultural education based upon a feeling that the particular major would meet their individual needs for self-rule, cognitive growth, or emotional bonding.

Furthermore, Deci and Ryan (1985) introduced a subtheory within SDT, the *organismic integration theory* (OIT) specifically detailing the different forms of extrinsic motivation and the contextual factors that either promote or hinder internalization and integration. In this subtheory, the four types of extrinsic motivation are (a) external, (b) introjected, (c) indentified, and (d) integrated regulation (Vallerand & Bissonette, 1992). *External regulation* occurs when behavior is regulated with outside inducements, typically with rewards or constraints. *Introjected regulation* occurs when behavior is internally regulated and the individual is self-imposing rewards or constraints. *Identified regulation* occurs when a behavior is valued by the individual and is perceived as self-chosen. Finally, *integrated regulation* occurs when the behavior is performed because it fits within the individual's self-concept. Thus, if a minority student were identified as extrinsically motivated to select a particular major, they might do so because of outside rewards or constraints, self-imposed rewards or constraints, values that are self-selected, or due to a match with self-concept.

Although the theory uses traditional empirical methods for exploring personality development and behavioral self-regulation (Ryan, Kuhl, & Deci, 1997), self-determination was implemented conceptually in this study to frame participants' motives for either selecting to major in agricultural education, or not. Through the course of the study, the researchers sought to understand reasons why minority students were self-determined to pursue a particular career.

Purpose and Objectives

The purpose, or central question, of this phenomenological study was, "What is the central reason(s) that motivates ethnic minority students to select agricultural education as their academic major in college?" Additionally, the following sub-questions, or objectives, were developed to further guide the study and analysis of the data collected. The sub questions were:

- Why do ethnic minority students select teaching agriculture at the secondary level as their profession?
- What hurdles limit ethnic minority students' career aspiration to teach agriculture at the secondary level?

Methods and Procedures

In this study, the self-determination theory was utilized. The researchers evaluated the theory through the steps of a phenomenology. The procedures for phenomenology, as illustrated by Moustakas (1994), consist of identifying a phenomenon to study, bracketing out one's experiences or biases, and collecting data from several persons who have experienced the phenomenon. Exploring minority students' lived experiences taps into a personal experience not previously studied or shared within agricultural education research. Because this research was qualitative in nature, it followed the basic assumptions of qualitative research (Creswell, 2007) including: (1) reality is subjective and has multiple views from multiple participants, (2) the distance between the researcher and the phenomenon being researched is minimized, (3) researchers are value-laden and must acknowledge the biases associated with their values, (4) the language is rhetorical in nature and reflective of the human role in the research, and (5) the research uses inductive logic and emergent themes. In a phenomenology, the researcher seeks to describe the meaning for several individuals' lived experiences of a concept or phenomenon (Creswell, 2007). Phenomenology is an attempt to approach a lived experience and future vision of an experience with a sense of “newness” in order to elicit rich and descriptive data into a firm interpretation (2007). In this study, the participants shared a lived experience. Each were an ethnic minority student, pursuing a career in the predominantly White agricultural education profession.

Sample

A purposive sample of 10 ethnic minority college undergraduates (seven females and three males) volunteered to participate in this phenomenological study. MANRRS advisors across the nation who planned to attend the conference were contacted and asked to nominate students who fit the purpose of the study. Polkinghorne (1989) suggests that a true phenomenological study consist of interviews from 5 to 25 individuals who have all experienced the phenomenon. The ethnicities of the participants were African American (five students) and Hispanic (five students). Each of the participants was an undergraduate student within the United States. A majority of the participants (7 out of 10) indicated that they were from a rural or suburban school. Elder (1992) defines a rural school as a school that represents at least 75% enrollment of students that reside from a rural home determined by the US Census Bureau. A suburban school ranges from 25% to 74% enrollment of students that reside from a rural home determined by the USCB (1992).

Procedures

After approval from the university’s Institutional Review Board and the advisor of the National organization of Minorities in Agriculture, Natural Resources and Related Sciences (MANRRS), undergraduate students attending the MANRRS conference were nominated by their organization sponsor to participate in an one-hour, nine-question, semi-structured focus group. After obtaining informed consent at the conference, 10 agricultural education students participated in the focus group meeting. The interview took place during the first day of the MANRRS conference at a designated area appointed by the advisor of the National MANRRS Organization (March 27, 2009). The interviews were audio-recorded and transcribed verbatim. A homogeneous type of sampling was utilized. Miles and Huberman (1994) explained this form of sampling that focuses, reduces, simplifies, and facilitates group interviewing.

A semi-structured interview protocol was prepared to assess minority student’s passion for following a degree path in agricultural education or the reason for not following an agricultural education degree path. Two researchers moderated the question and interview session. All of the students’ names were coded and a reflective journal was kept throughout the process in order to bring any research biases to light. The journal helped in organizing thoughts and strategies as well. A follow-up email asking for verification to responses and additional information was sent to each participating subject to validate the findings.

Data Analysis

Moustakas’ (1994) phenomenological method was employed in analyzing the transcripts of the participants. In this method, eight systematic steps in the data analysis procedures and guidelines were set for assembling the textual and structural descriptions. The six systematic steps are:

1. Describe the personal experience with the phenomenon under study
2. Develop a list of significant statements
3. Take the statements and group into larger units of information called themes
4. Written description of what the participants experienced with the phenomenon
5. Written description of how the experience happened
6. Written composite description of the phenomenon incorporating steps 4 and 5

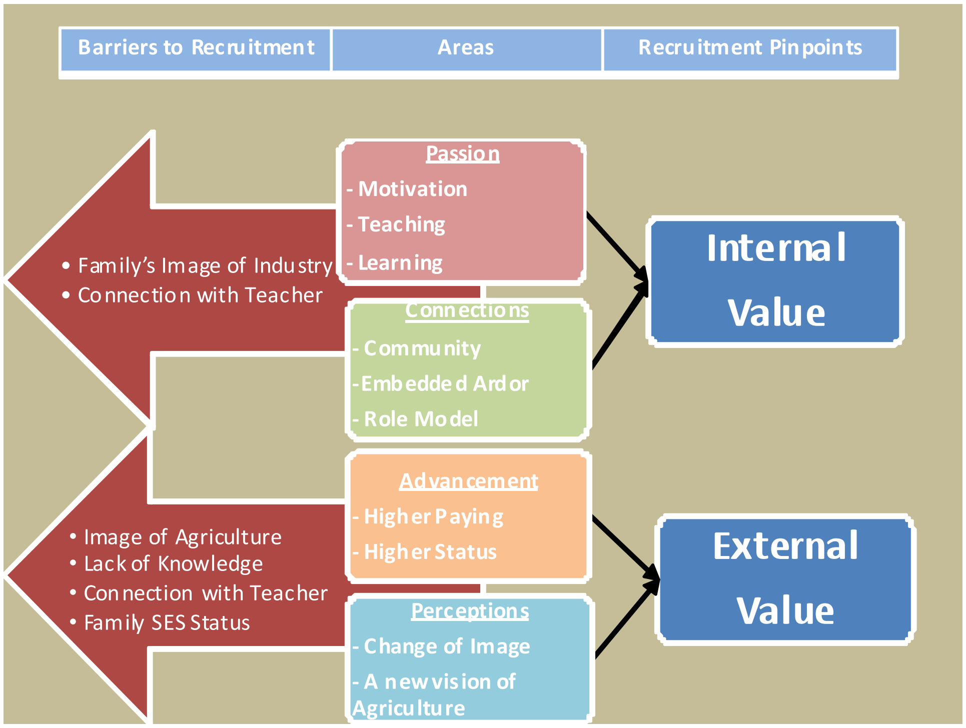
Trustworthiness

The process of validating the findings followed the format set by Creswell and Miller (2000). The researchers used follow-up interviews with the participants, and diverse methods of questioning, from two different researchers to triangulate the responses. An outside source was utilized to review the transcription and coding to validate the data, and the researchers engaged in a three-hour peer debriefing process after the interviews as well as several 1-hour peer debriefing meetings during the coding of the interviews and the write-up of the study. The researcher provided all respondents with the findings and asked for a confirmation/approval of the results as member checks. A detailed and thorough process of coding took place through separation of comments, highlighting key remarks, and writing of common themes. The researchers also attempted to bracket their own experiences as they coded the interviews (Denzin & Lincoln, 2000). One researcher was a White female with limited experience recruiting and teaching minority students, one researcher was a White male with limited experience teaching minority students but extensive research in minority issues, and one researcher was an African American male. Finally, an audit trail was created of all recorded transcriptions, sketched ideas, developed notes, summarized field notes, and identified codes. These audits kept a consistent flow of research and discussion limiting the amount of error in the findings.

Results and Findings

The major themes that emerged from this study were that minority students seemed to select agricultural education due to internal and external values. However, barriers must be overcome before minority students choose agricultural education as a college major. As outlined from the major themes identified in this study, Figure 1 illustrates a visual representation for recruiting minority students into agricultural education.

Figure 1. Visual Findings for Recruiting (Minority Students) Into Agricultural Education



Internal Value

Internal value emerged from the coding as a major thematic area and was defined by the researchers as the inherent worth of an act in a decision coming to fruition. In this study, participants were motivated to choose agricultural education due in part to the internal value they placed on the profession and the internal worth they could glean in the future. Participants selected agricultural education for internal reasons and were driven by the fun or challenge associated with the profession rather than external accolades, recognition, or money. In this study, the researchers found two areas that represented the theme of internal value: passion and connection.

Passion.

Whether students had graduated from a secondary agricultural education program or had entered agricultural education uninformed about the profession, students of different ethnicities expressed a passion for making a positive difference through teaching and philanthropic activities. The participants who specifically indicated that they wanted to become teachers, described that they had a passion for motivating others, a passion for teaching, and a passion for learning. This passion was reflected by several quotes:

"I love students and I love learning myself."

"I enjoy learning and the only way to continue learning is by teaching."

"It is really important for me to teach, it's just my passion."

"…I want to be there to just push them and help them get up and walk."

"…but then again, I want to love what I am doing."

"…a passion to help people with what they need and so on."

Connection.

In addition to passion, the participants explained an internal value of connection as a major reason for selecting agricultural education. The participants connected with agricultural education and other individuals within agricultural education who represented a similar devotion to agricultural education. This connection was based on relationships, and was very familial in nature. A family member motivated the participants specifically, they were motivated to choose agricultural education by someone they felt closely connected with in the profession, or they choose to stay connected to the profession and members of the profession that were a key part of their personal networks. Participants chose agricultural education because wanted to give back to their home community, or they wanted to serve as a role model and influence others in the same way they were influenced. The sub-theme of connection were illustrated through the following quotes:

> "I never saw myself or immersing myself in agriculture, but because of her (secondary agriculture teacher), I see that."
>
> "Six years after I graduated from high school, I still have that connection with him (secondary agriculture teacher)…he influenced me to appreciate agriculture and the diversity of agriculture."
>
> "It's worth it if you're giving back to something that put so much into you."
>
> "I could influence others or the world to a better environment, wait a minute, I can still teach and teach agriculture? Why didn't I think of this in the first place?"
>
> "I just could feel the connection because I feel comfortable speaking Spanish with my teacher, not in English."
>
> "I would love to talk to those students and steer them in the right direction."
>
> "My high school teacher convinced me to go into agriculture."
>
> "We look at teachers as a role model. As a person of respect, not saying that other cultures don't, but when my agriculture teacher says that agriculture is a good thing, check it out. What did I do? I checked it out because it is a good thing. He understood what the culture was."

External Value

The second major thematic area that emerged from the coding was External Value. External value was referred to as the regulation or act of advancement in a social setting. External value was identified as a thematic area where minority students were motivated toward a particular major, specifically because of the perceived professional advancement they could achieve within that major. Specifically, participants with an External Value orientation were motivated into agricultural education by the possibility of advancement and the perceptions they had for agricultural education and related careers.

Advancement.

Externally, minority students were influenced by the advancement options following their initial career selection in agricultural education. The participants noted that they were persuaded by individuals to select agricultural education as a major because the degree could serve as a stepping-stone for advancement in pay or status. The participants also noted that by majoring in agricultural education, they could make themselves unique among others because a major in agricultural education was seen as diversified. Through the conference interviews and follow-up interviews, the following quotes represented the theme of advancement:

> "My goal is to eventually receive my PhD and teach at Cal Poly."

> "I don't want to do it for the rest of my life. I want to be a professor, maybe a dean at a college."

> "I could actually see myself teaching at Virginia State University and teaching there."

> "I see myself in the agricultural education field for a good five years and ultimately getting my masters in administration and becoming a principal."

Perceptions.

The majority of the participants in the study indicated that at first, they were either not aware of the spectrum of opportunities in agriculture or they believed that a shadow covered agriculture with a negative connotation. They noted that they selected agricultural education as a major only after someone provided them with a better understanding of the industry of agriculture as a whole. Through this deeper understanding, they began to value a major in agricultural education. The participants indicated that once they understood that a degree in agricultural education could open a door to more options and opportunities than what they originally speculated as "just farming" or "just teaching", they had an external value toward agricultural education as a major. Thus, for these participants, the value of a degree in agricultural education meant a shifting of perceptions. The following direct quotations represent the "perceptions" sub-theme as follows:

> "The fact that it is everything. It is food, clothes, and everything we need come from Ag. So you don't have to be just a farmer to be in Ag. You can practically work anywhere and be in Ag."

> "See, a lot of people don't understand that a degree in agriculture can, actually, do so many different things."

> "They (minority students) get exposed to what agriculture science and technology is. After the exposure, they begin thinking about a higher education."

> "There are so many opportunities for me in agriculture."

Barriers

The third major theme that emerged from the interviews in this study was the notion of barriers. The participants noted that they faced a number of barriers throughout their lives that prohibited some of them and would prohibit others from choosing agricultural education as a major. These barriers were categorized under two major sub-themes as they related to motivation. Participants experienced both internal and external value barriers when deciding to major in agricultural education.

Internal value barriers.

As stated earlier in the findings, the primary internal values experienced by participants who selected agricultural education were passion and connection. Through the interview process, the researchers uncovered barriers that existed in reducing the value of one's internal reason for selecting agricultural education as a major. One Internal Value barrier theme that emerged was overcoming the family's image of the industry. Family members were described earlier in the findings as being a part of the connection that students felt for agricultural education. Family was also described to be a barrier. Specifically, participants were influenced heavily by what their families did for a living or by what they perceived was worthy in a profession or area of work. Thus, the participants explained that they chose agricultural education because of their family, but their family would have also influenced them away from agricultural education, had the situation been different. The participants noted that family plays a large role for other minorities who don't select agricultural education as a major. The following quotes through personal interviews, conference interviews, and follow-up interviews illustrated the Internal Value barriers:

> "If my family support was not present, I would probably taken over my father's business in Mexico and receive my degree in accounting."

> "My brother steered me toward agriculture even though I did have that negative image."

> "So joining FFA and agriculture, my family is extremely proud because my great grandparents worked in the fields and that is what got them where we are today."

> "That is because since we were young, agriculture is something not encouraged or linked to positive motivation, so most students don't see the need of why to promote agriculture, which is a huge part of agriculture education."

"As far as law school is concerned, both of my parents want this and they been teaching this since the cradle."

"She convinced me to go into Ag and she pretty much convinced my parents. They were like, Ag, what is that? Agriculture Education, what is that?"

External value barriers.

The External Value Barriers theme emerged in the findings as the way participants and those they interact with perceived agriculture. The participants' negative perceptions of agriculture, lack of knowledge about agriculture, and the family's socio-economic status were described as barriers to considering an agricultural education career (see Figure 1). Thus, while perceptions were noted earlier in the findings to be a key part of the external value barriers toward selecting agricultural education, on the other side, negative perceptions of agriculture were a key part of the external value barriers for agricultural education as a major. The participants discussed some of the following as External Value barriers:

"You are not thinking in high school about how agriculture touches every aspect of life."

"I believe that a lot of Latinos/Hispanics still have a negative perception about agriculture. Most of our ancestors and to this day family members still work in the fields from sun up to sun down with minimal pay. Agriculture is sometimes related to illiteracy, extreme working conditions and very little reward."

"A lot of people have that mindset, maybe not negative, but they think about farms and stuff like that. You have to get them (minority students) past that so they understand it is something different. Even when I came to college at my freshmen orientation class, I still thought of agriculture as being farming."

"Then my family, my mother, they all wanted to know, what is a city boy trying to do in agriculture? They thought I was learning about farms and all that stuff.

Participants noted that they had developed negative images of agriculture initially due to a lack of knowledge in or ignorance about the opportunities within agriculture professions. When asked to explain the images of agriculture that the participants had prior to selecting their academic major, the following perceptions were described:

"Farming"

"…a lack of diversity"

"Which means it takes you back to slavery; it takes you back to manual labor; and that is the first thing you think of."

Conclusions/Recommendations/Implications

Agricultural education as a profession must strive to close the gap of minority isolation in the high school and university classrooms. The statistical data noting the absence of ethnic minorities in agricultural education and related disciplines illustrates this need (Census, 2006). It was concluded from the results of this study that to recruit minority students to agricultural education, the core values that ethnic minorities possess regarding major choice, as they are conceptualized both externally and internally, must be addressed.

Intrinsic motivation is defined by the self-determination theory as doing an activity for its inherent satisfaction. Students that are intrinsically motivated engage in an act out of curiosity or exploration as in a college major only for the intellectual understanding (Ryan & Deci, 2000b). From the results of this study, internal value was defined as the inherent worth that a student placed on their choice coming to fruition. It was concluded that internal value that a minority student placed on choosing a major in agricultural education was connected to the student's personal views and attachments. Thus, the passion they felt toward working in a particular profession or the connections made to them by individuals in the profession served as sub-themes to the overarching theme of internal value. This is consistent with motivation theory in that passion is developed and nurtured because of perceived autonomy support and competence (Mageau, Vallerand, Charest, Salvy, Lacaille, Bouffard, & Koestner, 2009), and connections are representative of relatedness. Agricultural educators must provide diverse opportunities that allow minority students to believe they can be successful in the profession, and that allow them to connect or relate to individuals on a personal level.

Extrinsic motivation is an activity done in order to attain some separable outcome that leads to avoiding failure or reaching a point of success (Ryan & Deci, 2000a). From the results of this study, it was concluded that having an external value toward agricultural education was with the textbook definition of extrinsic motivation. Furthermore, it was concluded that students with an external value orientation toward agricultural education as a major understood the opportunities for advancement and the perceived thoughts others may have toward their work in the profession. Thus, they selected their major based upon perceptions of how they might advance in the profession. For some of the participants, secondary teaching was seen as a means to an end for becoming an administrator or a professor, rather than being viewed as a terminal career. This is clearly representative of identified regulation because the participants chose this career option as a way to reach a goal (Ryan & Deci, 2000a). This finding implies that to recruit minority students into agricultural education, the diversity of career options within the discipline and opportunities for advancement should be communicated. Ethnic minorities, when selecting agricultural education as a career path, might not do so because they want to teach for 30 years and retire from a secondary school. They might be motivated by thinking about teaching for a few years and then working toward an advanced degree.

It was further concluded that the barriers to minority recruitment consisted of, but were not limited to, family's image of the agriculture industry, personal perceptions of agriculture, and a lack of understanding of availability. These barriers are similar to the findings from Dyer and Breja (2003) which described barriers to recruitment in agricultural education for all student populations. The positive connection the secondary agriculture teacher or agricultural education professional had with the student was critical in overcoming these barriers. Agricultural educators must implement better strategies that allow minority students to see the available opportunities in agriculture, such as career exploration activities and internship experiences, so that they know agriculture is a viable career option in which they can experience growth and success (Esters & Bowen, 2003; Esters, 2008; Anderson & Kim, 2009).

Currently, 1890 land grant institutions are utilizing this method of increasing the external and internal value and overcoming barriers with a better success rate than 1862 land grant institutions (Alston & Westbrook, 2006). This success may be inherent to the type of institution because of the higher minority faculty rate and student population. However, 1862 land grant institutions can create this welcoming environment and overcome the barriers that currently exist by working to diversify the faculty and student population. In addition, teacher education programs must immerse rural pre-service teachers in situations that build understanding (Talbert & Edwin, 2008) and breakdown stereotypical barriers. In order to support the literature, it is recommended that agricultural education put-forth extra efforts in expanding into school districts with diverse populations. This would allow minority students that are not in rural schools to understand the vast amount of opportunities that exist in the agriculture profession. Prior to the expansion, agricultural education, teacher preparation programs must educate and immerse pre-service teachers in an atmosphere that provides them with the necessary tools to teach in a multicultural classroom.

From the visual finding (see Figure 1), it is recommended that to recruit an agricultural education minority student, internal and external values must be reached and recruitment barriers should be addressed. From the findings, it is posited that barriers hinder students in reaching an internal and external value for teaching agriculture. As noted in previous literature, perceptions regarding agriculture create barriers that minority students must overcome before they can identify the internal and external value of pursuing the academic major (Leatheberry & Wellman, 1988; Dobbins et.al., 2002). These barriers must be acknowledged as early as possible to provide adequate time for a student to process the career and academic major decisions. Also, the implication of this finding suggests that there is a need for agriculture educators to become immersed in various cultures by making personal connections with the students, the students' parents, and their communities. This connection would aid in understanding the internal values that regulate students of different cultures and the impact these cultures have on the agricultural industry (Warren & Alston, 2005).

Based upon the findings, this study offers practical consideration for additional phenomenological research in minority recruitment. This study, while valuable, provided merely a surface level glimpse into the minority experience and minority thinking about agricultural education. It is recommended that more in-depth, prolonged qualitative research be conducted to explore the phenomenon of the minority experience in agricultural education, agricultural sciences, and related disciplines. It is recommended that further quantitative research be conducted to investigate the difference in self-motivation of rural and urban as well as white and non-white school-based agriculture students for selecting particular college majors. Finally, a mixed methods study should be conducted using the Academic Motivation Scale (Vallerand et al., 1992) with a similar focus group to determine if the measures of intrinsic and extrinsic motivation match the motives identified by participant interviews as reasons for the selection of a particular college major.

This study provided a lens into the perspective of the minority student when making a decision about college major choice. Minority students desire to enroll in a class and major in a profession in which they can relate and one with a teacher that understands their culture, regardless of that teacher's particular culture. Regardless of whether or not a program for school –based agricultural education exists in an area with a high proportion of minority students, postsecondary agricultural educators should extend their service arms to minority students and serve as a link to college through urban collaborative projects and academic preparation workshops, and thereby form the connection to and foster the passion for agricultural education in the minds of ethnic minority students.

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An Unknown Perspective: A Phenomenology of the Non-Retained Student

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The purpose of this qualitative study was to obtain the perspective of the non-retained student regarding the college experience. A body of literature in agricultural education has examined student retention from the perspective degree completers, however little is known about college experience through the lens of the non-retained student. Thus, a need existed for an in-depth examination of the perspective of those who have actually experienced attrition. This investigation was guided by the Self-Determination Theory of motivation, as applied in the context of the non-retained student. Four themes were identified in the findings including: ownership of the college experience, positive perception of the college, relationships and sense of community, and development of future goals. The findings yielded further understanding concerning student motivation as it relates to non-retention. Insights from the study provided recommendations for college faculty and staff to revise advising, and support services to incorporate the needs of students who might be at risk for attrition.

Introduction

Retention rates have been a concern for universities for the greater part of the last century (Mohr, Eiche, & Sedlacek, 1998). Universities are facing increasing financial strain, and efforts in student retention continue to grow (Recruitment and Retention in Higher Education, 2006). Yet, the impact of non-retention is felt beyond university systems. The Institute for Higher Education Policy (2005) identified unique benefits that both individuals and their communities enjoy following the completion of a college degree.

A college degree is valuable beyond the monetary benefit to the universities that students attend. Carr and Roessner (2002) termed the private financial benefit due to education as the "education premium." College degrees have shown benefit to both individuals and communities (Institute for Higher Education Policy, 2005). The public and private social benefits of a college-educated populous include reduction in crime, increased quality of life, social cohesion, improvement in health, improved decision making, and increased personal status. Likewise, the economic benefits of a college-educated population include increased tax revenues, greater productivity, higher workforce flexibility, decreased reliance on government financial support, higher salaries and benefits, improved working conditions, and higher mobility (Institute for Higher Education Policy, 2005). Furthermore, communities have been encouraged to provide adequate postsecondary education in order to increase their attractiveness to current and potential citizens (Hatton, 1997).

The education premium, while of documented value, comes at a cost. "The price of college has consistently risen faster than inflation, [but] the more important trend is that the cost of college has fundamentally shifted from the state to the student" (Fairweather, 2006, p. 3). While the financial cost of higher education has increased and continues to rise, the potential loss that students may experience from not completing a degree outweigh the financial costs. Thus, it is important to examine the factors that contribute to student persistence in college.

Titus (2006) outlined specific variables that contribute to student persistence in college. Student experiential variables, specifically college academic performance, declaring a major, living on campus, and being involved in the college environment, were found to affect persistence. In other work, mentoring has been shown to increase retention rates and grade point averages for first-year, low achieving students (Salintrini, 2005). While many student-related variables were significantly correlated to persistence in college, variables specific to the particular college were found to impact student persistence in broader ways. This work posited that there is a positive correlation between an institutional focus on student retention and the extent of university reliance on student tuition (Titus, 2006). In addition, the study suggested that there is a negative correlation between student retention and institutional expenditures on administration (Titus, 2006).

Research within the field of agricultural education has primarily focused on college success for retained students. One study identified that current college admission criteria (high school GPA and GEFT score) had limited value in predicting student retention (Garton, Dyer, King, & Ball, 2000). Other research indicated that a relationship exists between the number of prior college credits a student had earned and retention (Smith & Garton, 2008). Further research (Killingsworth, Smith, Maxwell, Ball, & Garton, 2009) identified trends in prior college credit and increased academic performance and retention to the sophomore year, as well as degree completion rates. Additionally, investigations in agricultural education have attempted to identify consistent predictors for student retention. One study found that participation in agricultural youth organizations was a significant predictor of retention, while participation in on-campus Freshman Interest Groups was not a significant predictor of retention (Ball, Garton, & Dyer, 2001). Two other studies yielded conflicting findings in regard to the influence of high school agricultural enrollment on student retention and success. One found that high school agriculture enrollment was one of the best predictors of student retention into the sophomore year (Dyer, Breja, & Haase-Wittler, 2002), while another study did not yield similar significant results (Smith, Garton, & Kitchel, 2007). Despite conflicting results, both studies provided deeper understanding of predictors of student success as it relates to the completion of a college degree.

Non-retained students, specifically, have been the focus of multiple investigations in other fields of educational research. One such investigation found that non-retained college seniors credited dissatisfaction with academic guidance, access to school-related information, and quality of education for their attrition prior to degree completion (Mohr, Eiche, & Sedlacek, 1998). Additionally, former students exhibited feelings of institutional alienation (Mohr, Eiche, & Sedlacek, 1998). Yet another study described the need to connect expectations for potentially non-retained students with realistic goals for achievement following degree completion (Fielding, Belfield, & Thomas, 1998).

Within agricultural education, there has been a lack of research that focused only on non-retained students. Many studies have compared *ex post facto* data for non-retained to retained students. Among the results, one study indicated that students credited heavy involvement in experiences outside the classroom (clubs and activities) as encouraging persistence (Cole & Fanno, 1999). Another study suggested that students felt involvement in outside activities decreased performance in coursework and served to increase the chance of attrition (Kitchel, 2008). However, further comparison yielded little difference in engagement in activities between the retained and non-retained students (Kitchel, 2008).

While it is helpful to understand the commonalities among degree completers within a college of agriculture, perhaps deeper insight could be obtained from the perspective of some uncommon students—specifically those who are not retained in a college. The broader student persistence literature cites variables related to educational quality as the reason for attrition. Yet, the College of Agriculture, Food and Natural Resources (CAFNR) at the University of Missouri espouses educational quality, a teaching focused mission, and being student centered as its hallmark. Thus, either the college is not meeting its own standards or students in the college, who are not retained to the sophomore year, leave for other reasons. This study seeks to describe the phenomenon experienced by those non-retained students.

Theoretical Framework

Most of the theory concerning postsecondary student retention tends to take a social integration stance. These theories argue that academic success and retention are the result of a connection between the student and the culture of the institution (Tinto, 1987). Later theories suggest that a feeling of connection to a college and the collegiate experience is the responsibility of the student as well as the academic and social portions of the college's community (Tinto, 1993). For this study, it was reasoned that this interaction would be inadequate, damaged, or missing altogether, for the non-retained student.

Beyond Tinto's work, Terrenzini and his peers (Pascarella & Terrenzini, 2005; Terrenzini & Reason, 2005) developed more elaborate theory concerning the experience of students in the college environment. Their efforts yielded a model that conceptualized that the college experience, along with pre-college characteristics and experience, contributes to the student experience in college and impact later outcomes. This model, again, approached the college student experience from the perspective of retained students.

Because this study sought to gain a deeper understanding of the individual experience of a non-retained student, the theoretical framework that guided the study was Self-Determination Theory (Deci & Ryan, 2002). This theory posits that, early in life, individuals are motivated primarily by physical needs, based on instinct. Through time, individuals can sort through external factors to then self-determine their own internal value of those factors. Developmentally, college students are able to sort through their own personal values pertaining to a number of external factors. Thus, college students make decisions pertaining to the college they are attending and the degree they are seeking based on these factors.

Behavior is driven by motivational factors, which can be viewed on the continuum between intrinsic and extrinsic influence. Behavior that falls between the two extremes originates as extrinsic, but shifts inward as the motivation is becomes self-determined and internalized. Consequently, social factors influence motivation in three primary domains: global, contextual, and situational. Many different life contexts exist, however Deci and Ryan (2002) stated that research suggests three areas of highest importance with young adults: education, leisure, and interpersonal relationships (see Figure 1). With education, like all factors at the contextual level, the level of internal motivation (IM), external motivation (EM), or amotivation (AM) is influenced by contextual determinants and leads to contextual consequences.

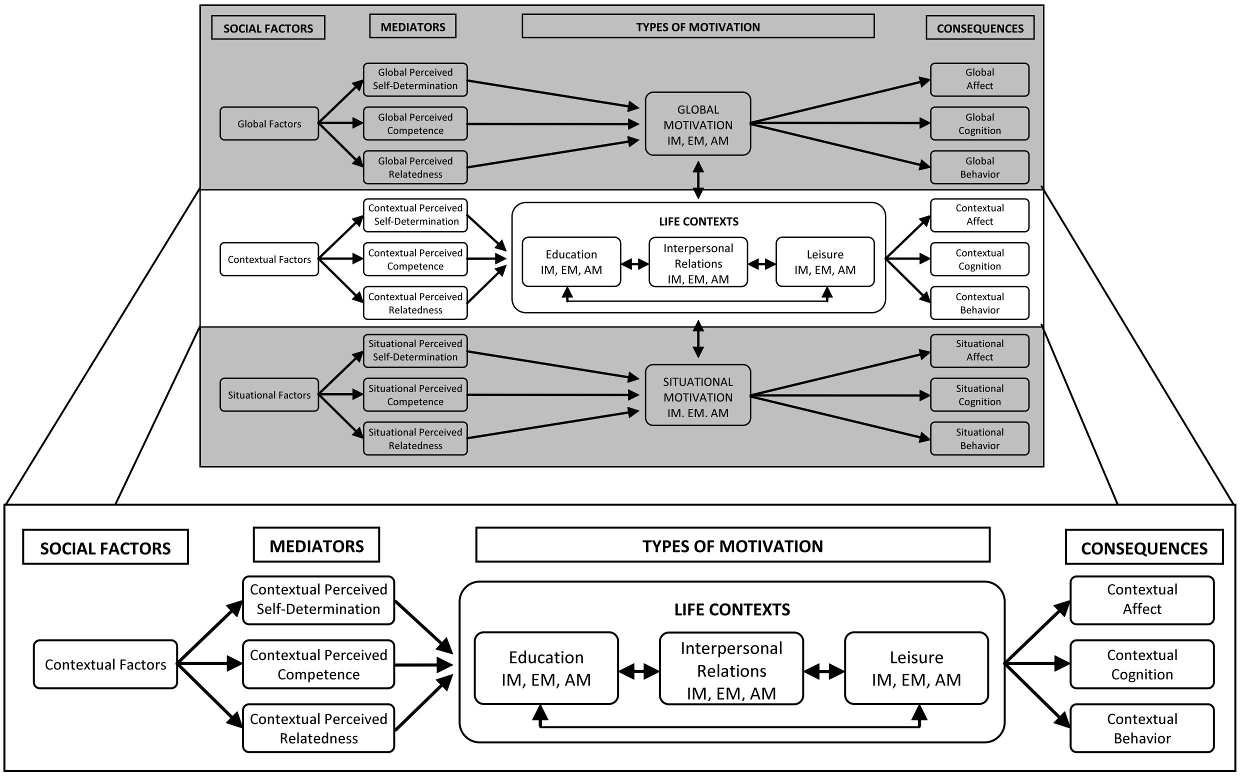

Figure 1. The Contextual Level of the Hierarchical Model of Intrinsic and Extrinsic Motivation (adapted from Deci & Ryan, 2002).

For the purpose of this study, education is considered a contextual factor. College students will determine or place value on their educational experience based upon how much, value they place on the college experience (contextual perceived self-determination), their desire to be competent (contextual perceived competence), and how much they value a sense of college community (contextual perceived relatedness). These values then determine their level of motivation toward education, interpersonal relations, and leisure. Finally, the amount of motivation college students have in a particular area will then impact particular outcomes such as how they feel about the college experience (contextual affect), how much they learn (contextual cognition), and behavioral choices such as whether or not they persist toward degree completion (contextual behavior). The primary contextual behavior of concern is the choice to persist in the college.

Purpose/Central Question

The purpose of this phenomenological study was to describe the phenomenon of non-retention for 2008 freshmen in the College of Agriculture, Food and Natural Resources (CAFNR) at the University of Missouri. As suggested by Creswell (2007), two primary questions needed to be approached in regards to the experience: 1) "What have you experienced in terms of the phenomenon?" and 2) "What contexts or situations have typically influenced or affected your experiences of the phenomenon?" For the purpose of this study the central question was: "How do non-retained students describe the college experience?" Sub-questions guided the development of the open-ended interview format, and included consideration of why students left and their perception of strengths and weaknesses of the college program. Specific categories included overall feelings toward the experience in the college, advising, coursework, outside activities, supports and resources utilized, current enrollment, and predictors of retention.

Methods/Procedures

In order to better understand the essence of non-retention a phenomenological research design was employed. Creswell (2007) suggests this method "in order to develop a deeper understanding about the features of the phenomenon" (p. 60). Specifically, this study sought to describe the phenomenon experienced by students that were not retained into the sophomore year in the College of Agriculture, Food and Natural Resources (CAFNR) at the University of Missouri.

In conducting this study the researchers were guided by the approach outlined by Moustakas (1994). The researchers first clearly identified the shared phenomenon of interest. Through the process of bracketing, the researchers then discussed their current understanding of the phenomena and acknowledged any biases or preconceived notions that they held. This important process is undertaken to ensure that the researchers are open and receptive to the data collection process and the themes that arise through the process of data analysis (Colaizzi, 1978; Creswell, 2007). Finally, detailed descriptions of each non-retained students' experiences, perspectives, and motivation were developed. Similarities that consistently appeared developed into themes that described the essence of the phenomenon of non-retention.

Sampling

Upon receipt of exempt status from the University Institutional Review Board a list of all students who were not retained into the sophomore year (2008-09 school year) was obtained from the CAFNR academic programs office. This list ($N = 42$) served as the population for this study. Using the last known primary contact phone number, the research team made at least two attempts to contact each participant. These attempts were made at various times throughout the day in an effort to maximize student accessibility (work, school, etc).

This multiple contact strategy resulted in a total of nine students (five female [56%], four male [44%]) agreeing to participate in the study. Participants were similar in gender to the total population of non-retained students: 25 female (60%) and 17 male (40%). Of the 15 majors in the college, six were represented by the participant group (3 = Animal Science; 2 = Biochemistry; 1 = Agricultural Education; 1 = Parks, Recreation and Tourism; 1 = Fisheries and Wildlife; and 1 = Undecided Agriculture). Finally, four of the participants (44%) were retained at the University of Missouri under a degree outside of CAFNR, while five (56%) were not retained in the university.

Data Collection

When conducting a phenomenological study it is suggested that the sample be comprised of between 5 and 25 individuals (Polkinghorne, 1989). Interviews of the nine participants ranged in length according to student response. A semi-structured interview protocol was developed, and interviews were recorded digitally for transcription. During the interviews, notes were taken detailing both interview and subject characteristics (tone, pace, and interest). Following each interview, researcher reflection was documented in order to capture further perspective of the interview.

Data Analysis

Following transcription, coding was conducted according to Moustakas' (1994) design. Transcripts of the interviews were reviewed and a list of significant statements was developed and grouped into "meaning units" or themes. A textural description of the non-retained experience was then developed to identify "what" the subjects experienced. Likewise, a structural description was developed to indicate "how" the non-retained phenomenon occurred. Finally, a composite description was developed, combining both textural and structural descriptions. This produced a description of the true essence of the non-retained phenomenon as viewed by the researcher. It should be noted that this effort is limited to describing the phenomenon as experienced by a specific group of postsecondary students, and the results of the study should not be interpreted beyond the participants of the study.

Trustworthiness.

Credibility and trustworthiness were addressed in multiple ways (Creswell, 2007). Detailed field notes were taken by interviewers in order to provide detail not captured by audio recordings. Following the interview process, transcriptions included pauses and filler words in order to fully capture the essence of interviewees' perspective. Additionally, rich and thick descriptions were developed after repeated readings of the interview transcripts to allow the reader to make decisions regarding transferability. Finally, the researchers attempted to triangulate the data through peer debrief and reflective journals among the research team.

The researchers using paper, pencils, and highlighter markers coded the data, and the codes were further organized into representative themes. Three researchers coded each interview independently and confirmed findings for intercoder agreement of codes and themes (Creswell, 2007). To further ensure the credibility of the results, researchers utilized several strategies to validate the findings of the study (Creswell & Miller, 2000). An audit trail was maintained, including all labeled codes and developed themes. Peer review, a process where someone outside of the research team evaluated preliminary findings, was utilized to provide an external check of the research process. Finally, researcher bias was bracketed prior to data collection, which supports both credibility and confirmability of findings (Lincoln & Guba, 1985).

Bracketing.

As discussed earlier, the process of bracketing allowed the researchers to identify and acknowledge any preconceived notions or biases they may hold about the topic of study (Creswell, 2007). All three researchers had similar paths through education. Two are currently working toward a PhD in Agricultural Education; the remaining researcher is currently a member of the CAFNR faculty. With multiple years of experience teaching high school, all three researchers share similar perspectives of high school preparation and value of postsecondary education. It is assumed that there will be differing viewpoints within the interview subjects, with the possibility that non-retained students may have negative viewpoints toward the college that they chose to leave.

It should be noted that personal college experience greatly shaped the perspectives of the researchers for this study. In an attempt to be as open as possible to the potential views of participants, personal experience has been acknowledged and considered. In an effort to obtain data that is consistent with subject perspective and not excessively impacted by researcher bias, all transcriptions, field notes, and reflections were viewed as sources of data that were obtained from individuals with exclusive experiences.

The researchers share a similar past in research emphasis, as well. With multiple projects concerning the retention of students in CAFNR, each researcher has developed personal viewpoints toward the topic of student retention. With this in mind, a specific effort was made to acknowledge these perspectives and recognize that experiences of non-retained students may yield new insight that conflict with the experiences of retained students. Efforts included discussion of potential areas of under-examination in past research and development of an open-ended interview format that allowed for diverse input from respondents.

Results/Findings

Non-retained students identified four major themes regarding their experience. The themes included: ownership of the college experience, positive perception of the college, relationships and community, and development of future goals. All four themes provided a connection between the social factors, mediators, life context of education. As a result, their experience produced motivation that led to consequential behavior—leaving the college. The first theme directly relates to student perceived self-determination.

Ownership of the College Experience

The experience of non-retention, as viewed by these participants, was a matter of individual choice. All interviewed students consistently perceived that they had total control of their college path. Many of the students in this study had very low GPAs, and either were placed on academic probation by the college or would have been placed on probation. Despite potential academic actions from the college, students expressed personal ownership of the choice to leave the college. In short, these students knew they might have been or were being asked to leave the college due to poor academic performance, yet they still maintained that they made the choice to leave. While these students felt like their justification for leaving the college was unique from other college students, only four reasons were cited: personal choice, lack of desired major, campus proximity to home, and high tuition costs.

Each participant shared specific factors that contributed to the decision to leave the college, but maintained that they individually made the choice and were satisfied with it. One student clearly stated, “I just chose to study another subject.” Another student described, “I chose about a semester ago that I was not gonna come back—not due to anything that happened there, it’s just that I found another program that’s closer to home, a little bit cheaper, and easier so that’s what I chose to do.”

In addition to viewing attrition as a self-determined choice, a few non-retained students isolated themselves from university staff while arriving at that decision. One student expressed, “I kind of didn’t want to hear it. I didn’t want to be persuaded because I was afraid that I really might have bought into what they were saying, you know, and I just did not want to stay.” However, the majority of participants expressed that help was needed to weigh the options and make informed decisions. A selected passage clearly displays the true essence of the struggle: “I was always overwhelmed with it and never really searched for help other than that, or resources other than that…It seemed so big to me. I didn’t know where to start looking.”

While most students expressed struggling through the process of defining their academic path, they consistently articulated that the responsibility fell primarily on their shoulders. When asked for factors that impacted their success, one individual stated “I think [it] depends a lot more on the student than the actual program or the advisor or the professors. I don’t know if that’s really the fault of the college if the student decides to switch.” Clearly, while input from others was valued by students throughout the non-retained experience, they continued to feel a personal ownership of their decisions and control of the experience.

Positive Perception of the College

Every student interviewed described positive experiences in the college. Likewise, student suggestions for improvement detailed targets for individual classes and staff members, but none for the college itself. Like most others, one participant spoke of the college fondly: “I guess it’s like a family. They do try to keep all their students involved.”

Specific areas that received high praise included faculty from most departments, high-quality educational experiences, and beneficial student support for career services, availability of scholarships, and personal advising. Consequently, multiple students made reference to the amount of support that was available to CAFNR students as compared to other colleges in the University of Missouri. Despite their own decision to leave, non-retained students conveyed that the college excelled in providing support to students. When asked about the experience with her advisor in another college, one student responded “the advisor that I have now, compared to her, it’s definitely different and you can tell and it’s a lot better when you have an advisor that will take the time to help, but yeah I had a great advisor.”

Relationships and Community

Another consistent theme was student need for relationships and establishing a sense of community. Both inside (faculty, advisors, staff, and peers) and outside (family and friends) the university, students displayed a great need for interaction and the impact it had on their experience. When speaking of college staff, one student stated “every time I would go to one of the fairs in the summers they would just, you know, recognize me and it was nice. They definitely strived to have a very personal relationship with their students.” Non-retained students developed supporting relationships with both faculty and personal contacts. Likewise, the participants noted that classroom teaching and advising contributed to creating relationships between students and university faculty. It is important to note that this college does not employ professional academic advisors; rather, advising is a part of the teaching expectations for faculty members.

Generally, interviews yielded the suggestion that quality advising contributed to student success in the college. When asked what would encourage a student to stay in the college, one student responded "I think just, just the professors expressing their personality. This past semester, my ecology teachers actually scheduled a meeting with them to where we could get to know them more personally, and I thought that that was a really good idea." It is no coincidence that high praise was almost always reported concerning faculty advisors—a source of great effort and pride within the college.

Students not only expressed a desire for a healthy relationship with their advisor, but most students suggested that the college made a particularly effective effort compared to faculty in other colleges at the university. One student shared, "I felt like she really put the time in, I mean like the advisor that I have now compared to her, it's definitely different and you can tell and it's a lot better when you have an advisor that will take the time to help." However, not all students had the same advising experience: "I was going through a lot of things first semester and I didn't really feel like she cared that much." The student went on to explain how that lack of relationship contributed toward their overall experience. Thus, in both directions, the importance of the advising relationship was connected to the experience of the non-retained student.

One relationship of great concern to non-retained students was with their close friends and family. One student noted, "As far as being successful at the university, I think a lot of factors depend on the support network you have, not just from professors and, you know, the academic side—all of that's extremely helpful, but also from your friends and your family." This student shared similar sentiment as others interviewed—that strong support is very beneficial to college success. When initially asked for their perspective on the college experience, one student even cited this interaction as the principle reason for leaving:

> It was a little ways from home for me, and I think I got really homesick and I don't know, I was in a relationship at that time, too. All my friends were from hometown…not very many kids from my high school graduated and went to Mizzou…and so it was just really me there by myself and I didn't like it so that's primarily why I came back. I wanted to be out of there. I wanted to be in hometown with all my friends, [and] my girlfriend.

However, not all non-retained students expressed exclusively positive experiences within the college community. One student stated, "I definitely felt a little bit out of place because I've never owned a Carhartt jacket…and I felt like in some of my classes that [I] was one of the few who didn't." This sentiment of a rural-dominated, conservative student population was shared by many. While students believed that many were served well, they felt like the predominant student-type was catered to and they didn't feel like they were represented in that group. Another student summed it up when they stated, "I really really liked it, but…I feel like it was more ag-based than anything…It didn't have exactly what I was looking for."

Development of Future Goals

Direction was a topic discussed during most of the interviews. Whether discussing other students' search for the ideal educational path or their own, the participants detailed the value of available college resources (staff, services, and materials). Likewise, many expressed great appreciation for faculty advising in the college. However, despite the efforts by the college to aide in the transition into college life, many described a strain from larger classes and demanding coursework that further compounded the process of defining clear direction.

Most students communicated, in some form, a specific need for direction. One student stated, “College students are pretty wishy-washy sometimes, as far as what they want. And that’s a tough one right there.” Two students cited the lack of preferred major as the primary reason for leaving. Another student cited that they simply “changed [their] mind,” resulting in three different majors during the first two years of study.

Multiple students had a perspective of the college experience that included a time period for defining their future intentions, and that it was a natural growth experience. One student casually approached the topic, saying “I came in because I didn’t know what I was going to do and I found out. I found what I would be interested in doing and so I switched…it was just, I found out what I wanted to do.” Another student described their personal journey:

> College students change their major a million times so it’s not necessarily out of spite or anything [that] I’ve changed. I was Biology before I came, then I changed from Biology to Biochemistry, then I changed to Psychology, then I changed to Fisheries and Wildlife, and now I’m Art History and I think I’m going stay here, but it takes a while to really find your niche.

Conclusions/Recommendations/Implications

Based on the findings from this study, it was concluded that, in part, students were not retained to the sophomore year based upon something that the college was doing wrong, but rather based on a personal choice that they made. Thus, students self-determined a new direction in their educational path of their own accord (Deci & Ryan, 2002). This suggests that students experience some level of self-determination within the context of educational persistence. It also implies that some efforts within the college are providing adequate opportunity for students to internalize the decision-making process. However, increased efforts toward enhancing student awareness of positive contextual factors available in the college experience may be warranted. Further research in the area is needed to evaluate the effectiveness of such efforts.

Despite each of the participants’ individual experiences, it was concluded from the study that all indicated that they felt the college and university did everything that could be done to help ensure that they were supported during their college career. This conclusion is inconsistent with the broader college student literature that suggests student attrition is due to the quality of education and advising (Mohr, Eiche, & Sedlacek, 1998). Students expressed that while they ultimately chose to leave the college, they felt that they had a positive experience that they would not have changed. Ultimately, the decision to attend the university, and later to leave, was theirs to decide. This seems to indicate that while offices of academic programs in this particular college should not rest on their laurels, they can take pride in the fact that students, even those who were not retained, felt that the college provided adequate, if not exceptional, support to students.

It was further concluded that a personal relationship with a faculty advisor was a key to the experience of the non-retained student. While some participants indicated adequate and even superior advising relationships in the college, some students would have liked a better or more productive relationship with their faculty advisor. When asked about their experience with their advisor responses ranged from very positive to very negative, with some indicating they were not even sure who their advisor was. This is extremely alarming for a college that prides itself in being student friendly. Whether positive or negative, the relationship with the advisor was concluded as a critical link in the retention experience in this study. Research indicates that mentoring increases retention rates and grade point averages for first-year, low achieving students (Salintrini, 2005). It is recommended that student affairs offices provide opportunities for faculty professional development, specifically focused on advising and mentoring of students. Specific topics of discussion should include tips and tactics for advising students who are new to the university system and, in many cases, still deciding what their future career will be. Additionally, efforts should be made to create uniformity across academic majors and departments to ensure that all students, regardless of major, receive quality, individually-focused advising.

It was also concluded that while all non-retained students generally held positive perspectives regarding the support that they received from the college, many indicated that they felt like they might not have fit the mold of the typical [college] student. As shown by the student comments in the findings of this manuscript, some students feel that there is a stereotypical agriculture student and that because of their background or the way they dressed, they did not fit into the stereotype and therefore did not participate in some of the opportunities that the college offered. Research has suggested that academic success and retention are the result of a connection between the student and the institution community (Tinto, 1987 & 1993). It is recommended that efforts be made across the college to ensure that programs are inclusive and students, regardless of background, are welcomed and feel comfortable.

Finally, it was concluded that for a student to be successful they must have some direction or a sense of what career they want to pursue upon graduation. This seems to suggest that perhaps the best way for colleges to improve retention rates is to focus on helping students explore careers and majors in much greater detail before they enroll as a student. Likewise, this suggests that focus should be paid to the impact current efforts have on adjusting students' self-determined motivation (Deci & Ryan, 2002). It is recommended that the college develop much stronger relationships with high school guidance counselors. Additionally, teachers and counselors at the middle and high school levels should be encouraged to provide students with more opportunities for career exploration. Non-retained students repeatedly indicated that they changed majors or left the university because they simply did not know what they wanted to do. Universities must do more to partner with schools earlier in the student's career so they have a greater sense of direction and focus once they arrive on campus.

While it is important that teachers and counselors at the secondary level take an active role in preparing students for the post-secondary education, universities should implement or expand programs that help students transition to the university. A relationship has been shown between the number of prior college credits a student has earned and retention (Smith & Garton, 2008; Killingsworth, Smith, Maxwell, Ball, & Garton, 2009). This might suggest that these students were better prepared for the transition to the university because they already had experience in college level course work. As a result, special attention should be paid to helping students learn to navigate the universities course selection and registration process. Additional efforts should be made reduce class sizes during the early stages of a student's college career. Finally, greater care should be taken in identifying students who are at risk and provided them with support and counseling.

This study only begins to uncover the surface of a group with the potential to provide valuable insight into issues of student retention and successful degree completing. While limited in the number and length of interview, the themes identified were consistent among all participants and begin to paint a picture of the college experience from the point of view of a non-retained student. Further research is needed to gain a deeper understanding of the phenomenon in this environment. Likewise, studies at other universities may provide new insight and understanding.

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College of Agriculture Academic Advising in a Downturn Economy: Are Adjustments Needed?

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Abstract

Effective academic advising is a component of student retention. With ever increasing pressure from university administrators for academic advisors to improve retention rates of undergraduate students, it is increasingly important that advisors have the necessary tools for success. The purpose of this descriptive study was to assess similarities and differences between two entering college freshmen classes, one from a year of economic stability and one from a year of economic downturn, for factors identified with non-retention. The sample included 207 entering college freshmen from 2007 and 2008. The College Student Inventory was administered during summer orientations. Data related to scholarship recipient status and retention were also gathered. Results indicated there were no statistically significant differences between the two groups based on demographic variables. However there were differences based on academic strengths, scholarship recipient status and attitudinal characteristics related to college attendance. Considering the differences in the U.S. economy for the two years, there was no evidence to support a conclusion that the economy significantly impacted the two entering freshmen classes differently. The researchers recommended research toward a revised model of academic advising incorporating information about student habits, needs, and academic abilities.

Introduction & Theoretical Framework

The National Research Agenda for Agricultural Education and Communications (2007) included a research priority to "improve the success of students enrolled in agricultural and life sciences academic and technical programs" (p. 7). Land grant universities and especially colleges of agriculture have consistently been concerned with recruiting and retention. In a period of economic downturn, state supported schools especially must deal with budget cuts and budget shortfalls. Such financial circumstances may lead to tuition increases as a way to bolster a university's budget needs. However, tuition increases often require approval from state legislatures, which results in a lag in catch-up funding. Crockett (2009) reported a 70 percent increase in federal student loans between 1998 and 2008, while the same period showed a 536% increase in private sector education loans. These budget situations put even more importance on effective recruiting and retention.

The exponential growth of information technology and a continued decline in manufacturing have been instrumental in promoting the belief throughout the United States that a college education is key to future career and economic success (Becker, 1996; Cohen, 1998; Pascarella and Terenzini, 2005). However, as early as 1975, Tinto noted increasing numbers of students who disengaged and/or withdrew from the college education experience due to lack of compatibility between the students' expectations and the institutional environment.

Stern (1970) discovered the ideas and perceptions about college in general and certain schools in particular held by potential college students were not accurate reflections of college life. Stern developed the idea of the *Freshman Myth*, reporting that students tended toward extremely high expectations about all aspects of the college they initially entered and these expectations were significantly more positive than the experiences the same students reported after attending the school. Keup (2007) also examined the *Freshman Myth* concept and concluded that Sterns (1970) findings still held true. However, Keup additionally noted some departures from previous research; "not fulfilling certain expectations may actually enhance adjustment to college in other areas" (p. 27). Other researchers (Aitken, 1982; Pascarella and Terenzini, 1991, Pascarella and Terenzini, 2005) have continued to corroborate the Tinto model.

Many colleges and universities have instituted freshman orientation programs to help incoming students transition to the university experience. These may consist of a 2-3 day session just prior to school starting in the fall or may involve numerous sessions throughout the summer during which students and parents attend various informational and training sessions. Pascarella, Terenzini, and Wolfle (1986) characterized these programs as a form of anticipatory socialization, "a process or set of experiences through which individuals come to anticipate correctly the values, norms and behaviors they will encounter in a new social setting" (p. 156). These formalized socialization efforts should lead to increased commitment and decreased likelihood of non-retention (Pascarella, Terenzini, and Wolfle, 1986). These authors concluded, however, that "orientation had only a small direct influence on persistence, but…had relatively substantial and significant positive effects on both social integration during college… and subsequent commitment to the institution attended" (Pascarella, Terenzini, and Wolfle, 1986, p. 169).

Other researchers (Beal and Noel, 1980; Green and Miller, 1998) reported a relationship between freshmen orientation sessions, improved student grade point averages, re-enrollment and academic program completion. Still others have examined the variables that predicted college retention. Garton, Ball, and Dyer (2002) reported high school core GPA was a predictor of first-year cumulative college GPA, while the other traditional admissions criteria of ACT score and high school class rank were not. Crockett (2009) noted the importance of effective academic advising to college retention, especially in periods of economic downturn, to both maintain enrollment and to connect with students who may have to take time off from school for economic reasons.

Bean (2005) categorized the numerous factors affecting student retention into nine themes: 1) student's background; 2) money and finance; 3) grades and academic performance; 4) social factors; 5) bureaucratic factors; 6) external environment; 7) psychological and attitudinal factors; 8) institutional fit and commitment; and 9) intentions. The Noel-Levitz Retention Management System in place at many universities uses the College Student Inventory (CSI) to "identify dropout-prone students as they walk on campus and put in their path a prevention plan before the student experiences the feelings of being lost, confused, overwhelmed, underprepared and uncertain" (Stratil, n.d., p. 1). The CSI incorporates the nine themes identified by Bean (2005) into three categories: academic motivation, general coping skills, and receptivity to support services.

Stratil identified five objectives for the Retention Management System: 1) Assess students' individual academic and personal needs; 2) Recognize students' specific strengths and coping mechanisms so that successful intervention techniques in areas of need can be implemented; 3) Identify students who are at risk for academic and/or personal difficulties and who may even drop out; 4) Understand students' attitudes and motivational patterns so that intervention is more successful; 5) Enable advisors to have effective and rewarding personal contact with students early in the first term (Stratil, n.d., p. 2). The purveyors of the Retention Management system purport that the system, when used effectively, will increase retention rates especially between the first and second years of college.

The Noel-Levitz Retention Management System has been in place at Montana State University since 2001. The CSI has been administered to all incoming freshmen at each of the four summer orientations at the University. Data have been used to identify students who may be at risk for non-retention and to provide those students necessary resources. The follow-up was accomplished through the Dean of Students' Office (Erika Swanson, personal communication, Nov. 18, 2009). Even though individual students were identified for assistance through use of the CSI data, little had been done to provide insight for academic advisors who work closely with students toward the students' academic goals. One of the identifying areas was money and finance, however there had been no documented effort to identify those students who indicated on the CSI a concern with financing college. Such information could be greatly beneficial to academic advisors in providing not only individual but group advising sessions. Furthermore, there was a need to examine the impacts of national economic conditions on student academic needs, personal and professional needs and student career goals.

Purpose and Objectives

The purpose of this study was to assess similarities and differences between two entering college freshmen classes, one from a year of economic stability and one from a year of economic downturn, for factors identified with non-retention. To accomplish that purpose, the researchers developed and analyzed the following specific objectives.

1. Determine the degree of similarity for selected demographic characteristics between entering college freshman in a college of agriculture for the years 2007 (economic stability) and 2008 (economic downturn).
2. Determine if statistically significant differences existed between 2007 and 2008 entering freshman classes within a college of agriculture at a land grant university based on academic performance.
3. Determine if statistically significant differences existed between the 2007 and 2008 entering freshman classes within a college of agriculture at a land grant university based on self-perceived personal and professional needs of respondents.

Methods and Procedures

Population and Sample

The target population included all incoming freshmen students at Montana State University in 2007 and 2008. The purposive sample for this study was the incoming freshmen students who had declared a major within the college of agriculture (COA) at or before the summer-based freshman orientation sessions (2007 n=94 and 2008 n=113). This research was a part of a larger, ongoing research project to assess student retention and attrition factors at Montana State University.

Instrument

The College Student Inventory (CSI), consisted of Likert-type scale questions ranging from 1-7 (1 being not at all true and 7 being completely true). Noel-Levitz (2001), developer of the CSI, reported the instrument yielded a Cronbach's alpha reliability coefficient of 0.79. All orientation attendees completed the CSI as a mandatory part of the orientation process, thus the response rate was 100%. The researchers obtained the CSI data for the sample from the University Dean of Students' Office. Additionally, through the college of agriculture Dean's Office, the researchers gained access to the fall and spring grade point averages, college of agriculture scholarship recipient status and retention to the fall 2008 and 2009 semester, respectively, for the sample.

Data Analysis

The CSI data were analyzed to determine if statistically significant differences existed between the four orientation groups, the two different years, and orientation sessions one through four between the 2007 and 2008 subgroups. The student academic, scholarship and retention data were similarly analyzed for statistically significant differences. The researchers used chi-square analyses, independent samples t-tests, and one-way ANOVA with a Tukey post hoc test within SPSS V17 to analyze data.

Assumptions and Limitations

The researchers assumed the following for this study:

- All of the students answered the CSI honestly and to the best of their ability.
- Respondents were actually first time students of the new incoming freshman class with a declared major in the college of agriculture.
- Every student had an equal opportunity to apply for a college scholarship during their freshman college year.

The researchers recognized the following limitations for this research:

- This sample was from a single college within a single university.
- According to some economic analysts, the United States recession had already begun in 2007 and had not reached its peak in 2009. However, based on Crockett (2009), the researchers considered the 2007 entering freshman class to have entered college in a time of economic stability and the 2008 entering freshmen class to have entered college in a time of economic downturn.

Findings

Objective 1: Determine the similarity for selected demographic characteristics between entering college freshman in a college of agriculture for the years 2007 and 2008.

Incoming freshmen students reported gender, ethnicity, plans to work during college and the degree sought. The results were summarized in Table 1. There were slight percentage differences for gender and for ethnicity by year. In the plans to work category, over 60% of respondents each year indicated they intended to work between one and 20 hours per week. Interestingly, for each year, approximately two percent reported plans to work between 30 and 40-plus hours per week. Within the highest degree sought category, there were minimal percentage differences between the two years.

Table 1
Demographic data results for the 2007 and 2008 COA incoming freshmen

Variable	2007	2008	χ^2	p
Gender			0.020	0.888
Female	53.2%	52.2%		
Male	46.8%	47.8%		
Ethnicity			1.96	0.0743
Black/African-American	0.0%	0.0%		
American Indian or Alaskan Native	1.1%	0.9%		
Asian or Pacific Islander	1.1%	1.8%		
White/Caucasian	95.7%	92.9%		
Hispanic or Latino	0.0%	1.8%		
Prefer not to respond	2.1%	2.7%		
Plans to Work			6.715	0.243
0 hrs/wk	18.1%	24.8%		
1-10 hrs/wk	38.3%	31.0%		
11-20 hrs/wk	35.1%	32.0%		
21-30 hrs/wk	6.4%	9.0%		
31-40 hrs/wk	2.1%	0.0%		
40+ hrs/wk	0.0%	1.8%		
Degree Sought			1.294	0.73
Bachelors	50.0%	47.3%		
Masters	24.5%	23.2%		
Professional	25.5%	29.5%		

* $p<0.05$

Objective 2: Determine if statistically significant differences existed between 2007 and 2008 entering freshman classes within a college of agriculture at a land grant university based on academic performance.

Table 2 highlighted the self reported academic abilities of the 2007 and 2008 college of agriculture entering freshmen. In the year-by-year comparison, a statistically significant difference ($p = 0.029$) was noted for high school grades. The largest difference occurred in the number of students reporting B-C high school grade averages, with the 2008 group reporting 18.6% to the 2007 group's 8.5%. In the general knowledge category, students were asked to respond to the prompt "*compared to the average high school graduating senior in this country, I consider my general academic knowledge to be in the:*" followed by the ranges as shown in Table 2. The responses between years were comparable; no statistically significant differences were returned. Likewise, students responded to the statement, "*in relation to the general population of our society, I consider my academic ability to be:*" followed by the responses shown in Table 2. Once again, the responses between the two subgroups were comparable, with the most notable exception being the average response choice with 21.3% of the 2007 group and 31.9% of the 2008 group. Even so, the chi-square analysis revealed no statistical significance for the category.

Table 2
Self-perceived academic strengths and weaknesses of entering COA freshmen by class year

Variable	2007	2008	χ^2	p
High School Grades			12.473	0.029*
A	27.7%	23.0%		
A-B	44.7%	38.1%		
B	16.0%	15.9%		
B-C	8.5%	18.6%		
C	0.0%	4.4%		
C-D	3.2%	0.0%		
General Knowledge			1.356	0.852
80-100%	27.7%	24.1%		
60-80%	36.2%	35.7%		
40-60%	35.1%	37.5%		
20-40%	1.1%	1.8%		
0-20%	0.0%	0.9%		
Academic Ability			6.973	0.223
Extremely High	5.3%	4.4%		
Above Average	71.2%	62.9%		
Average	21.3%	31.9%		
Below Average	2.1%	0.9%		
Considerably Below Average	0.0%	0.0%		

*$p<0.05$

The researchers also collected data from the College of Agriculture Associate Dean to ascertain the numbers of students from the 2007 and 2008 classes, respectively, who had received scholarships during their first year in college (Table 3). At the researcher's particular university, scholarship applications were due on February 1 of each year and scholarships were awarded at a banquet each April. As noted in Table 3, the numbers of students receiving scholarships each year was comparable. However, because the 2008 entering freshmen class was larger (N=113)

Table 3

Comparison of 2007 and 2008 COA entering freshmen by scholarship recipient status

Variable	2007	*n*	2008	*n*	χ^2	*p*
Scholarship						
June	52.4%	11	23.3%	7	4.564	0.033*
1st July	35.3%	6	23.5%	8	0.788	0.375
2nd July	29.4%	5	16.7%	2	0.624	0.430
August	7.9%	3	18.9%	7	1.972	0.160
Total	26.6%	25	21.2%	24	0.815	0.367

Note. The percentages were based on the number of students attending each orientation session. The total was based on the total number of entering freshmen students in the COA for the year.
* $p<0.05$

than the 2007 entering freshman class (N=94), the percentage of scholarship recipients for 2008 was lower. Although the chi-square analysis revealed no statistically significant difference between the totals by year, there was a statistically significant difference ($p = 0.033$) when comparing the June orientations attendees from 2007 and 2008. Curiously, the scholarship recipient status decreased from the first to the last orientation session for the 2007 year, but held fairly steady across all orientation sessions for the 2008 year.

Table 4 highlighted the data analysis for the comparison of students retained to the second year, fall semester. While no statistically significant difference existed between the 2007 and 2008 years, trends were noted for both years. For each successive orientation session in 2007, fewer students were retained in the college of agriculture. From three of four 2007 orientation sessions, students had changed to a major outside the college of agriculture by the following fall semester. More alarmingly, in 2008, large percentages of students from each orientation session were no longer attending the university by the fall 2009 semester. For clarification, non-retained students may not have dropped out of school; at Montana State University there was no means by which to follow-up and determine if non-retained students had transferred to a different institution.

Table 4

Comparison of 2007 and 2008 COA entering freshmen by retention status

	2007			2008				
Variable	COA	Other	Non	COA	Other	Non	χ^2	*p*
Retention							0.693	0.707
June	81.0%	14.3%	4.8%	60.0%	0.0%	40.0%		
1st July	61.0%	27.8%	11.1%	64.7%	8.8%	26.5%		
2nd July	58.0%	0.0%	41.2%	58.3%	8.3%	33.3%		
August	36.8%	13.2%	50.0%	56.8%	21.6%	21.6%		

Note. COA = College of agriculture; Other = Transferred to other college within University; Non = Non-Retained Students

Objective 3: Determine if statistically significant differences existed between the 2007 and 2008 entering freshman classes within a college of agriculture at a land grant university based on self-perceived personal and professional needs of respondents.

The College Student Inventory instrument contained 90 Likert-type scaled questions to measure a variety of attitudes toward college. A comparison of the 2007 and 2008 entering classes revealed statistically significant differences in three areas; due to space constraints, only those statistically significant items were included in Table 5. The 2008 class, as a whole, reported less concern ($p = 0.036$) over finances than the 2007 class. In contrast, the 2007 entering students indicated a higher need ($p = 0.021$) to find scholarships. For a response related to college being worth the time, money and effort, the 2008 class, as a whole, was less convinced ($p = 0.005$). The 2008 group also reported a higher mean for difficulty in learning new vocabulary ($p = 0.008$). Even though there were statistically significant differences, it was important to note the means in relation to the range of available responses: 1 = not at all true, 7 = completely true. Thus, for the financial problems response, the 2008 combined responses were near the midpoint of the scale and for both the attitude toward university life response and the vocabulary response, both groups were on the *not at all true* side of the scale.

Table 5
Comparison of 2007 and 2008 COA entering freshmen by selected personal and attitudinal characteristics

Variable	2007	2008	*t*	*p*
Financial				
I don't have any financial problems that will interfere with my schoolwork.	3.4787	4.0885	-2.105	0.036*
I would like to talk to someone about getting a scholarship.	5.7128	5.1239	2.320	0.021*
Attitude Towards University or Academic Life				
I often wonder if college education is really worth all the time, money, and effort that I'm being asked to spend on it.	2.5745	3.2920	-2.813	0.005*
Academic				
Learning new vocabulary words is a slow and difficult process for me.	2.5532	3.1416	-2.68	0.008*

Note. scale ratings ranged from 1 = not at all true to 7 = completely true
*p<0.05

To determine whether differences existed among students based on orientation attended, the researchers grouped the 2007 and 2008 entering freshmen classes by the orientation sessions. Table 6 highlighted those variables that returned statistical significance. Overall, the students who attended the first (June) orientation had more positive attitudes about their high school teachers. Specifically, those attending the first orientation session reported significantly more positive responses than attendees at the other three orientation sessions ($p = 0.022$; $p = 0.021$; $p = 0.003$) to the statement, "*I liked my teachers, and feel they did a good job*". The June attendees also returned higher responses than both the second July (third session) ($p = 0.028$) and the August (last session) ($p = 0.047$) attendees for the statement, "*The teachers I had in school respected me as a person and treated me fairly*." In contrast, the first orientation attendees returned less positive responses than the third orientations attendees ($p = 0.012$) to the statement, "*Most of the teachers I had in school were opinionated and inflexible*."

Table 6
Comparison of 2007 and 2008 COA orientation groups by selected attitudinal characteristics

Variable	Session Ranked Higher	Session Ranked Lower	Mean Difference	*SD*	*p*
Student Teacher Relationship					
Most of the teachers I had in school were too opinionated and inflexible.	2nd July	June	1.01555	0.3281	0.012*
The teachers I had in school respected me as person and treated me fairly.	June	2nd July	0.87221	0.31114	0.028*
	June	August	0.63451	0.24281	0.047*
I liked my teachers, and I feel they did a good job.	June	1st July	0.78658	0.27271	0.022*
	June	2nd July	0.93644	0.32184	0.021*
	June	August	0.87529	0.25116	0.003*

*p<0.05

Conclusions, Recommendations, and Implications

Based on the research findings, the researchers made the following conclusions and recommendations. Findings for objective 1 revealed no statistically significant differences between the 2007 entering freshmen and the 2008 entering freshman in the college of agriculture at Montana State University. This particular finding was a foundation for the remaining objectives; if the two classes were statistically different in demographic variables, there was no way to assess the degree of similarity or difference for the remaining objectives. The percentage of respondents reporting ethnicity as White/Caucasian was higher than the University's reported White/Caucasian student percentage (84.5%) and the State's reported White/Caucasian population (90.4%). By comparison, the American Indian/Alaskan Native ethnicity reported in this study was lower than what was reported by the University (2.9%) and by the state (7.4%) (Montana State University, 2009 & U.S. Census Bureau, 2009). Thus, the college has diversity challenges that must be addressed. The researchers recommend the college-level administration work closely with university administration, the Native American Studies program, and the State's high schools to develop a strategic and systematic plan for recruiting Native American/Alaskan Native students, the second most populous ethnicity group in the state.

Over 60% of students in the 2007 and the 2008 groups reported they were planning to work 1-20 hours per week while attending school. This information has implications for academic advisors as they advise these incoming students and help them plan fall and spring coursework. At the present, such CSI demographic information is unavailable to academic advisors or staff to help aid students in making wise class choices.

Objective 2 sought to determine differences between 2007 and 2008 entering freshman classes based on academic performance. Significance was found between the orientation groups when they self reported their high school grades. The 2008 group in general reported lower grades than the 2007 group. This fact coupled with the fact that over 60% of the students planned to work 1-20 hours per week has implications for effective advising as well as implications for the university, the college and the departments in assisting students find employment that relates to and extends the students' academic programs.

Due to declining economic conditions, the college of agriculture was not able to provide as many scholarships to 2008 students ($111,000) as to 2007 students ($196,000) (Misti Richardson, personal communication, Dec. 18, 2009). Additionally, there was an enrollment increase in the college of agriculture between 2007 and 2008. Together, these factors may account for the significance found between the 2007 and 2008 groups related to scholarships received. Additional longitudinal research is needed to determine the implications of larger enrollments coupled with fewer scholarships. This is especially important in periods of economic downturn, such as the current condition of the U.S economy.

Of great concern is the large percentage of students who were not retained within the College of agriculture and the University. The general trend of lowered retention rates for each successive summer orientation requires further research and analysis. It is critical for the college of agriculture and university administrators to utilize the College Student Inventory data to develop a proactive means of monitoring student success prior to the student leaving the university either voluntarily or involuntarily, as discussed by Pascarella, Terenzini, and Wolfle (1986). The findings related to retention coupled with the findings related to the scholarship status and the percentage of students who planned to work have implications for a revised model of academic advising whereby faculty and staff have access to additional information about student habits, needs, and academic abilities in order to enhance the effectiveness of advising. Additional research is needed to determine if there is truly a correlation between scholarship received and retention status as was indicated in the finding for the August 2008 orientation, or if there were other variables involved that were not a part of the CSI.

Related to objective 3, the researchers found significant differences between the 2007 and 2008 groups for attitudes toward college. The 2007 incoming freshmen were more concerned with securing financial support for their college education, while the 2008 incoming freshmen reported less concern about financial problems that would interfere with their academics. That finding does not seem to correspond with the finding that over 60% of the students reported plans to work 1-20 hours per week. Considering the differences in the U.S. economy for the two years, there was no evidence to support a conclusion that the economy significantly impacted the two entering freshmen classes differently. Yet again, the implication for an advising model in which the academic advisor has access to the student's CSI results could lead to increased student retention and less student frustration related to the *Freshman Myth* (Stern 1970).

Examination of the College Student Inventory statement regarding respondents' negative thoughts or feelings towards their choice and future as a university student revealed the 2008 incoming freshmen rated the question significantly higher than did the 2007 incoming freshmen. In need of further research was the question as to whether the economy caused students to enroll at the university because there were diminished employment opportunities for high school graduates, as hypothesized by Crockett (2009). The comparison of two years' data was not enough to draw such a conclusion. A similar concern relates to retention of these students at the point adequate employment opportunities do occur, thereby negatively affecting student retention and college growth patterns. Additional research is recommended for these concerns.

The 2008 entering freshman class also reported a higher degree of difficulty with learning new vocabulary. Important to reiterate was the fact that even with significance, both the 2007 and 2008 groups were nearer the *not at all true* end of the scale. Also of note was the fact that not significant between the two groups were questions about math and science ability. Taken by itself, this finding cannot lead to a conclusion. However, in combination with the 2008 group's reporting of lower grades, more negative feelings about attending school, and lower retention, there is adequate evidence to conclude the 2008 group was different enough that additional efforts should be made to ensure these young men and women are able to reach their career goals. The implication is, once again, for a revised advising model, as previously discussed.

The June orientation session attendees reported more positive feelings towards their high school teachers than the other session attendees in both years. There is a need to examine further the students who select the earliest freshmen orientation sessions to determine their impetus for the selection. Combined with the finding that these particular students earned scholarships at higher rates than students in other sessions, there is a need for additional research to determine if this orientation group continues to earn scholarships, whether they become the student organization leaders and power brokers within the college setting and whether there are other long-term advantages to attending the earlier orientation sessions.

The researchers recommend this study be repeated every year at least through economic recovery to gain the necessary longitudinal data that would reveal whether trends exist between economic stability, college enrollment and college retention. Additionally the research should be expanded throughout the U.S. in order to provide the theoretical framework necessary to develop the strategic and systematic advising model that will effectively provide for the needs of students and academic advisors alike. Such research will assist in answering the question, "What teaching, advising, and mentoring strategies most effectively and efficiently yield desired student outcomes with particular groups of students" (The National Research Agenda for Agricultural Education and Communications 2007, p. 7). Faculty members in Departments of Agricultural Education have a unique opportunity to be the leaders in this social science research that is critical to retention efforts in Colleges of Agriculture throughout the United States.

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Student Perceptions of Academic Advising Needs & Faculty Advisor Performance in a College of Agriculture

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Abstract

Student satisfaction, retention, and attrition are issues of concern for all institutions of higher education. Often, one component of efforts to address such issues involves an emphasis on student-faculty interaction. Such interaction may the form of faculty advising, which is recognized as a powerful tool for increasing student satisfaction and retention. However, in order to enhance the academic advising offered, institutions must first assess students' advising needs and current faculty advisor performance. As a result, this study sought to investigate undergraduate student academic advising needs and faculty advisor performance in the College of Agriculture, Food and Natural Resources at the University of Missouri (N = 1619). A total of 726 students (44.84%) completed the instrument in Spring 2008. Overall, students indicated high importance for many academic advising characteristics. The Availability/Accessibility construct, yielded the highest summated mean rating, indicating students desire an advisor who is easily available to assist them with individual needs. The Knowledge/Helpfulness construct yielded the lowest summated mean importance rating. With regard to faculty advisor performance, students were generally satisfied with the advising received. The constructs of Availability/Accessibility and Personable/Approachable received the highest performance ratings. Ten advising items were identified as Category I discrepancies using a modified Borich needs assessment model.

Introduction

According to the publication entitled, *A test of leadership: Charting the future of U.S. higher education* (U.S. Department of Education, 2006), lawmakers and educators alike should be recognized for their efforts to increase the number of young people seeking a college education. However, "too little attention has been paid to helping them graduate" (U.S. Department of Education, p. 13). Indeed, many higher education institutions continually struggle to address issues of student satisfaction and retention.

To adequately satisfy and retain students in institutions of higher education, proactive measures must be taken. Research has indicated a link between student involvement and student satisfaction (Tinto, 1985). Specifically, Astin (1984) and Pascarella (1985) suggested that regular, meaningful interaction with faculty members may positively impact student motivation and involvement. Frost (1991) expanded on the positive benefits of such involvement, stating "involved students are more likely to be academically and socially integrated into a college community" (p. 2). Such integration is likely to increase students' success in college (Tinto, 1987).

Academic advising provides an opportunity for meaningful interaction with faculty. In fact, in some cases, academic advising may provide the *only* structured opportunity for a relationship between a student and an institutional representative (Frost, 1991). Mohr, Eiche, and

Sedlacek (1998) found senior students with meaningful relationships with faculty and advisors were more likely to finish their degree program than those who were referred to student services. A student satisfaction assessment conducted by Pennsylvania's State System of Higher Education in 1996, which sought to develop a model for predicting attrition, found five factors that accounted for the most variance in reenrollment (Bailey, Bauman & Lata, 1998). Those factors included: major, overall experience, campus community, faculty, and advising. Finally, Richard Light (2001) stated "students who get the most out of college, grow the most academically, and who are the happiest organize their time to include activities with faculty members" (p.10).

According to Gordon (1992), academic advising is a "dynamic process that can have a significant impact on both student and institution" (p. 47). Frost (1991) indicated that quality academic advising programs provide an opportunity for systematic academic planning and enhance retention through student involvement. Metzner (1989) found similar findings, reporting that academic advising can increase students' satisfaction with college and reduce institutional attrition. Hunter and White (2004) reiterated the importance of academic advising to both institutions and enrolled students in their article, *Could fixing academic advising fix higher education?,* stating:

> Our belief is that effective advising is now more important and relevant than ever. …Resources from federal and state government as well as private granting agencies are drying up. The outlook for students is equally worrisome. Some states are pulling scholarships from students who take longer than four years to graduate. The job market is not as good…and tuition costs are climbing for students and their families. As the cost of higher education increases, so do expectations of students and families. …In terms of maximizing resources, building a sound advising system is an investment in effective goal clarification by students and more efficient process to program or degree completion (p. 21).

Cox and Orehovec (2007) explained that when students engage with faculty, they feel valued and important. As one student explained, "You become more than just a number. ...You're no longer just another one, you're an individual, you have a name..." (Cox & Orehovec, p. 355). Berdahl (1995) stated that "students completing a bachelor's degree often report that their initial apprehension upon entering the new world of a university was reduced considerably by the person or persons who helped them get started" (p. 10). Conversely, according to Gardiner (1998), "the poor quality of academic advising they receive must surely have a powerful retardant effect on our students' development" (p. 81).

The question remains, what is successful advising? What do students need, or desire, in an advisor-advisee relationship? Studies have revealed four factors most often cited as important to students (Crockett, 1982; Frost, 1991; Gordon, Habley & Associates, 2000; Ender, Winston & Miller, 1982; Winston, Grites, Miller & Ender, 1984), including accessibility, specific and accurate information, advice and counsel, and a personalized relationship (Crockett; Cuseo, 2008). Belcheir (2000) found when students were asked about the greatest problem in the current advising system at Boise State University, the top two responses could be categorized into "lack of knowledge or help when conferring with the advisor" and "accessibility of advisors and time"

(p. 5). Similarly, according to Creamer and Scott (2000) the ability to provide accurate guidance in a timely manner is one of the most important characteristics students desire in an academic advisor.

Wilbur (2003) explained, "academic advising, when done right, offers students and faculty an additional opportunity to connect in meaningful ways" (p. 201). But, how can we be sure academic advising is being "done right" at our institutions? How can quality academic advising be assured? According to Boers (2001), the only way educators can meet students' expectations is if the exact nature of the expectations are known. The same can be said for academic advising expectations. In order for academic advisors, faculty or others, to meet expectations of their advisees, they must first know advisees' expectations and seek to understand how the expectations are formed (Propp & Rhodes, 2006).

However, knowing advisees' expectations and preferences is not enough. As Wilbur (2003) suggests, evaluation is key. Wilbur continues, "every strong advising program identified by NACADA or other national organizations has integrated an effective system to monitor quality" (p. 214). The purpose of advisor evaluation is to improve effectiveness (Creamer & Scott, 2000). To date, much of the data collected through research regarding advisor performance or effectiveness indicates that faculty advisors are satisfactorily meeting the needs of most students, though there remain areas where improvement could be made (Habley, 2003).

Theoretical Framework

For this particular study, two frameworks were utilized. Specifically, the frameworks selected included Terenzini and Reason's (2005) model for studying college impact and Tinto's (1975) theory of social integration. Each framework recognizes the complexity of the college experience and the multitude of factors that contribute to the success and/or failure of college students. Each also reinforces the important role academic advising plays in a student's college experience.

Terenzini and Reason's (2005) model for studying college impact was developed based on the work of Pascarella and Terenzini (1991, 2005) and Terenzini and Reason. The framework takes into consideration a multitude of forces which help to shape students' first year of college and, ultimately, identifies three primary components of variables involved in the study of college impact. The three components include: pre-college characteristics and experience, the college experience, and outcomes. The initial framework was adapted to meet the needs of studying college student development and success from an agricultural perspective. The specific aspect of the college impact model that incorporated academic advising focuses on the institutional environment of the college experience.

Terenzini and Reason's (2005) model contains many components based upon the work of Tinto (1975, 1993) as evidenced by the many factors and variables in their studies of college impact and the college experience. Not surprisingly then, Tinto's studies of academic persistence and causes of attrition (1975) also suggested interactions with faculty, peer groups and extracurricular activities are quite important to students success. Tinto referred to such interactions as "mechanisms of social integration" (p. 107). Therefore, Tinto's (1975) theory of social integration served as a framework for this study. Social integration refers to the level of congruence between an individual and the social system they are a part of (Braxton, Sullivan & Johnson, 1997). Tinto's (1993) theory also suggested the contact a student has with faculty and staff is extremely important. According to Tinto (1993), while such "interaction by itself does not guarantee persistence; the absence of interaction almost always enhances the likelihood of departure" (p. 117).

Purpose/Objectives

The purpose of this study was two-fold. First, this study sought to assess the importance of academic advising characteristics as perceived by undergraduate students in a college of agriculture at a select Midwest university. Secondly, the study examined faculty advisors performance with regard to the academic advising characteristics. Specifically, the following objectives were developed to guide the study:

1. Describe the demographic characteristics of undergraduate students in the college of agriculture (sex, academic level, undergraduate degree program).
2. Describe the importance of academic advising characteristics as perceived by undergraduate students.
3. Describe faculty advisors' performance on academic advising characteristics as perceived by undergraduate students.
4. Prioritize the academic advising characteristics, according to undergraduate students, in need of enhancement by using a modified Borich needs assessment model.

Methods/Procedures

This study utilized survey research methods. The target population consisted of undergraduate students enrolled in 11 of the 15 academic degree programs within the College of Agriculture, Food and Natural Resources at the University of Missouri during the spring 2008 semester (N = 1,619). Because of differences in program structure and advising processes, four academic degree programs were not included in the population. The frame for this study was obtained from the College's Academic Programs Office and was scrutinized for errors, omissions, and duplicates to address potential frame error and ensure accuracy.

One source was utilized for the collection of data. An online instrument, the Faculty Advising Instrument, was distributed via email to all currently enrolled students using Hosted Survey™, a web-hosted software application. Using a double-matrix format, respondents were asked to rate the level of importance and faculty advisor performance for 34 items relating to faculty advising using two separate 5-point Likert scales. Each of the 34 items aligned with one of four academic advising constructs (Availability/Accessibility, Knowledge/Helpfulness, Personable/Approachable, and Counseling/Mentoring), as identified by Cuseo (2008).

A panel of experts, which consisted of 11 university faculty members representing higher education institutions across the United States, reviewed the instrument for face, content, and construct validity. Panel members were selected based upon faculty advising experience and expertise and/or extensive knowledge about faculty advising within colleges of agriculture. A pilot test was conducted with December 2007 graduates of the College to determine the instrument's reliability. The resulting Cronbach's alpha coefficients for the four constructs ranged from .82 to .94. As a result, the instrument was deemed reliable.

Miller and Smith (1983) stated, "data gathered from self-selected respondents may represent the opinions of the entire sample or population" (p. 45). To address the issue of non-response, several steps were taken. Multiple contacts were used, according to a modified version of the Dillman (2007) *Tailored Design Method*, emails were personalized, and a link to the instrument was included with each reminder email. A total of 726 students completed all components of the instrument yielding a 45% response rate.

To ensure the accepting sample was representative of the population, respondents were compared to the entire student enrollment on selected demographic variables including sex, ethnicity, academic level and undergraduate degree program. Frequencies and percentages for the accepting sample were then compared with frequencies and percentages for the population. Differences between the two which were less than or equal to 10% were considered acceptable.

Results/Findings

Research objective one sought to analyze the demographic characteristics of undergraduate students. A total of 401 (55.23%) respondents were female, while the remaining 325 (44.77%) were male. With regard to students' academic level, the greatest percentage of respondents, 31.54% (229 of 726), were seniors. Both freshmen and sophomores accounted for 20.66% of the total respondents, with 150 from each academic level completing the Faculty Advising Instrument. Juniors accounted for 27.13% (197 of 726). Animal Science (n = 176), Biochemistry (n = 107), and Hotel and Restaurant Management (n = 105) were the three degree program areas with the greatest number of students responding.

Research objective two (describe the importance of academic advising characteristics as perceived by undergraduate students) and research objective three (describe faculty advisors' performance on academic advising characteristics as perceived by undergraduate students) each utilized a five point Likert scale. For added clarity in reporting means and standard deviations, each of the 34 academic advising characteristics have been grouped by construct and then ranked based on the mean importance rating.

Of the six academic advising characteristics included in the Availability/Accessibility construct, three were found to have mean importance ratings of 4.50 or greater (see Table 1). These items included *available when I need assistance*, *responds to my requests in a timely fashion*, and *on time for advising appointments with me*. The item with the lowest mean importance within the Availability/Accessibility construct was *provides an effective process for scheduling advising appointments*.

All six academic advising characteristics included in the Availability/Accessibility construct were found to have mean performance ratings of 4.24 or greater (see Table 1). One item, *on time for advising appointments with me* received a mean performance rating that exceeded 4.50 (M = 4.58; SD = .78).

Table 1

Perceived Importance of and Faculty Performance on Advising Characteristics within the Availability/Accessibility Construct (n = 730*)*

Construct Item	Perceived Importance		Faculty Advisor Performance	
	M	*SD*	*M*	*SD*
Available when I need assistance	4.59	.61	4.25	1.02
Responds to my requests in a timely fashion (email, phone calls, etc)	4.58	.59	4.39	.96
On time for advising appointments/meetings with me	4.51	.72	4.58	.78
Maintains an open line of communication	4.49	.68	4.24	1.07
Provides sufficient time for advising appointments	4.43	.69	4.41	.90
Provides an effective process for scheduling advising appointments	4.22	.80	4.24	.99
Summated Score	4.47	.52	4.36	.78

Note. Perceived Importance Scale: 1.00 – 1.50 = Not Important, 1.51 – 2.50 = Of Little Importance, 2.51 – 3.50 = Somewhat Important, 3.51 – 4.50 = Important, 4.51 – 5.00 = Very Important. Performance Scale: 1.00 – 1.50 = Poor, 1.51 – 2.50 = Fair, 2.51 – 3.50 = Satisfactory, 3.51 – 4.50 = Good, 4.51 – 5.00 = Excellent.

Fourteen academic advising characteristics were included in the Knowledge/Helpfulness construct, of which three items had mean importance ratings of 4.50 or greater (see Table 2). The three items included *communicates degree requirements*, *encourages academic success*, and *aware of my academic progress*. Six items within the Knowledge/Helpfulness construct reported mean importance ratings less than 4.00.

With regard to faculty advising performance on the 14 items included in the Knowledge/Helpfulness construct, four academic advising characteristics received performance ratings of 4.00 or better (see Table 2). The four items included *encourages academic success* (*M* = 4.38; *SD* = .97), *communicates degree requirements* (*M* = 4.21; *SD* = 1.13), *knowledgeable about general education courses* (*M* = 4.12; *SD* = 1.12), and *assists in selecting/changing my academic major* (*M* = 4.03; *SD* = 1.14). Two items within this construct reported mean performance ratings of less than 3.50. The five items receiving the lowest performance ratings included *provides information about educational opportunities beyond my Bachelor's degree* (*M* = 3.69; *SD* = 1.26), *suggests academic resources* (*M* = 3.51; *SD* = 1.24), *provides information about obtaining financial assistance* (*M* = 3.50; *SD* = 1.27), *provides information about using web-based student information system* (*M* = 3.47; *SD* = 1.25), and *provides information regarding study skills* (*M* = 3.37; *SD* = 1.26).

Table 2
Perceived Importance of and Faculty Performance on Advising Characteristics within the Knowledge/Helpfulness Construct (n = 730)

Construct Item	Perceived Importance		Faculty Advisor Performance	
	M	*SD*	*M*	*SD*
Communicates degree requirements	4.73	.57	4.21	1.13
Encourages academic success	4.56	.70	4.38	.97
Aware of my academic progress	4.54	.67	3.93	1.14
Assists in identifying potential areas of employment after college	4.41	.82	3.77	1.23
Knowledgeable about general education courses	4.39	.74	4.12	1.12
Helps clarify life goals	4.18	.90	3.77	1.24
Provides information about educational opportunities beyond my Bachelor's degree	4.11	.93	3.69	1.26
Provides information about obtaining financial assistance	4.02	1.04	3.50	1.27
Assists in selecting/changing my academic major	3.95	1.19	4.03	1.14
Encourages involvement in co-curricular student activities	3.86	1.11	3.97	1.18
Provides information about using web-based student information system	3.50	1.06	3.47	1.25
Helps obtain employment on campus	3.46	1.29	3.72	1.26
Suggests academic resources	3.43	1.07	3.51	1.24
Provides information regarding study skills	3.37	1.15	3.37	1.26
Summated Score	4.04	.55	3.92	.91

Note. Perceived Importance Scale: 1.00 – 1.50 = Not Important, 1.51 – 2.50 = Of Little Importance, 2.51 – 3.50 = Somewhat Important, 3.51 – 4.50 = Important, 4.51 – 5.00 = Very Important. Performance Scale: 1.00 – 1.50 = Poor, 1.51 – 2.50 = Fair, 2.51 – 3.50 = Satisfactory, 3.51 – 4.50 = Good, 4.51 – 5.00 = Excellent.

The Personable/Approachable construct consisted of six academic advising characteristics. Of the six items, two had mean importance ratings of 4.50 or greater, while only one item had a mean importance rating of less than 4.00 (see Table 3). The two items which yielded mean importance ratings over 4.50 included *easy to talk with*, and *respects my decisions*. The item, *acknowledges me in social settings* yielded a mean importance rating of 3.78.

Four of the six items included in the Personable/Approachable construct reported mean performance ratings that exceeded 4.20 (see Table 3). The two items receiving the lowest mean performance ratings in this construct were *acknowledges me in social settings* (*M* =4.18; *SD* = 1.14), and *familiar with my academic background* (*M* = 3.87; *SD* = 1.13).

Table 3

Perceived Importance of and Faculty Performance on Advising Characteristics within the Personable/Approachable Construct (n = 730*)*

	Perceived Importance		Faculty Advisor Performance	
Construct Item	*M*	*SD*	*M*	*SD*
Easy to talk with	4.59	.64	4.40	.98
Respects my decisions	4.50	.68	4.39	.84
Provides a caring, open atmosphere	4.38	.77	4.29	.99
Seems to enjoy advising	4.32	.82	4.37	.97
Familiar with my academic background	4.29	.74	3.96	1.13
Acknowledges me in social settings	3.78	1.08	4.18	1.14
Summated Score	4.31	.56	4.29	.82

Note. Perceived Importance Scale: 1.00 – 1.50 = Not Important, 1.51 – 2.50 = Of Little Importance, 2.51 – 3.50 = Somewhat Important, 3.51 – 4.50 = Important, 4.51 – 5.00 = Very Important. Performance Scale: 1.00 – 1.50 = Poor, 1.51 – 2.50 = Fair, 2.51 – 3.50 = Satisfactory, 3.51 – 4.50 = Good, 4.51 – 5.00 = Excellent.

Eight academic advising characteristics were included in the Counseling/Mentoring construct. One item, *helps select courses that match my interests,* resulted in a mean importance rating which exceeded 4.50 (see Table 4). Conversely, only one item, *willing to discuss personal problems,* generated a mean importance rating less than 4.00.

With regard to the eight academic advising characteristics within the Counseling/Mentoring construct, four items received mean performance ratings which were greater than 4.00 (see Table 4). *Encourages me to assume an active role in planning my academic program* (*M* = 4.25; *SD* = 1.00), *helps select courses that match my interests* (*M* = 4.20; *SD* = 1.09), *expresses concern for my personal development* (*M* = 4.10; *SD* = 1.10), and *stimulates my interest in an academic discipline* (*M* = 4.03; *SD* = 1.04) were the highest ranking items in this construct. The four remaining items reported mean performance ratings between 3.72 and 3.92.

Table 4

Perceived Importance of and Faculty Performance Advising Characteristics within the Counseling/Mentoring Construct (n = 730)

Construct Item	Perceived Importance		Faculty Advisor Performance	
	M	*SD*	*M*	*SD*
Helps select courses that match my interests	4.53	.66	4.20	1.09
Encourages me to assume an active role in planning my academic program	4.35	.79	4.25	1.00
Encourages me to explore career areas of interest	4.24	.85	3.92	1.20
Expresses concern for my personal development	4.16	.94	4.10	1.10
Helps me identify obstacles to overcome before I reach my educational goals	4.14	.87	3.88	1.13
Stimulates my interest in an academic discipline	4.08	.91	4.03	1.04
Suggests strategies to cope with academic challenges	4.07	.97	3.73	1.25
Willing to discuss personal problems	3.14	1.27	3.72	1.20
Summated Score	4.09	.63	4.05	.91

Note. Perceived Importance Scale: 1.00 – 1.50 = Not Important, 1.51 – 2.50 = Of Little Importance, 2.51 – 3.50 = Somewhat Important, 3.51 – 4.50 = Important, 4.51 – 5.00 = Very Important. Performance Scale: 1.00 – 1.50 = Poor, 1.51 – 2.50 = Fair, 2.51 – 3.50 = Satisfactory, 3.51 – 4.50 = Good, 4.51 – 5.00 = Excellent.

Summated mean importance ratings for each of the four academic advising constructs are also reported in the preceding tables. The greatest summated mean importance rating was reported for the Availability/Accessibility construct (M = 4.47; SD = .52), with the lowest summated mean importance rating reported for the Knowledge/Helpfulness construct (M = 4.04; SD = .55).

Research objective four sought to prioritize the academic advising characteristics, according to students' perceptions, in need of improvement using a modified Borich needs assessment model. Such a model uses discrepancy scores to simultaneously measure two constructs (Borich, 1980). For this objective, a discrepancy score was calculated for each of the 34 academic advising characteristics by subtracting the raw performance rating from the raw importance rating for each respondent. Once discrepancy scores were calculated, a weighted discrepancy score was figured by multiplying each discrepancy score by its corresponding academic advising characteristic's mean importance rating. Finally, a mean weighted discrepancy score (MWDS) was calculated by totaling the weighted discrepancy scores for each academic advising characteristic and dividing the sum by the total number of respondents (n = 730). To prioritize the academic advising characteristics and potentially identify those in need of enhancement by faculty advisors, three categories were created using naturally occurring breaks to group the mean weighted discrepancy scores (see Table 5).

Category I consisted of all MWDS greater than 2.25 and was considered a large discrepancy. A total of ten academic advising characteristics were grouped in Category I. Category II included 17 items with MWDS ranging from 1.03 to 2.16. The remaining seven items, with MWDS less than 1.00, were placed into Category III.

Table 5
Students' Perceptions of the Advising/Advisor Characteristics Using Mean Weighted Discrepancy Scores (n = 730)

Category	Advising/Advisor Characteristic	MWDS
I	Assists in identifying potential areas of employment after college	4.46
	Provides information about obtaining financial assistance	4.04
	Aware of my academic progress	3.11
	Provides information about educational opportunities beyond my Bachelor's degree	2.95
	Suggests strategies to cope with academic challenges	2.83
	Communicates degree requirements	2.71
	Assists in selecting/changing my undergraduate degree program	2.69
	Helps clarify life goals	2.61
	Helps obtain employment on campus	2.57
	Helps me identify obstacles to overcome before I reach my educational goals	2.48
II	Encourages me to explore career areas of interest	2.16
	Helps select courses that match my interests	1.97
	Provides information regarding study skills	1.91
	Available when I need assistance	1.89
	Familiar with my academic background	1.81
	Stimulates my interest in an academic discipline	1.79
	Knowledgeable about general education courses	1.67
	Maintains an open line of communication	1.43
	Provides information about using web-based student information system	1.38
	Encourages academic success	1.31
	Suggests academic resources	1.28
	Responds to my requests in a timely fashion	1.26
	Expresses concern for my personal development	1.16
	Easy to talk with	1.13
	Respects my decisions	1.10
	Encourages involvement in co-curricular student activities	1.07
	Willing to discuss personal problems	1.03
III	Encourages me to assume an active role in planning my academic program	0.89
	Provides a caring, open atmosphere	0.76
	Provides sufficient time for advising appointments	0.50
	Provides an effective process for scheduling appointments	0.32
	Seems to enjoy advising	0.15
	On time for advising appointments with me	0.05
	Acknowledges me in social settings	-0.02

Conclusions/ Implications/Recommendations

With a 45% response rate, it can be concluded academic advising is an issue of importance to many students. A total of 26 academic advising characteristics were rated between important and very important by students in this study, with all 34 characteristics rated at least somewhat important. Based on these findings, one could presume the instrument included academic advising characteristics relevant to students' needs. Since the instrument was developed based upon existing literature and academic advising instruments, this should be expected.

With regard to the four academic advising constructs, students rated Availability/Accessibility and Personable/Approachable as the most important. Based on these ratings, it could be suggested that faculty advisors make a conscious effort to convey their availability and take time to meet students' needs. Although faculty advisors must juggle many priorities and obligations, making students feel valued and cared for is essential. These findings also suggest students appreciate an open door policy and friendly atmosphere. Perhaps faculty advisors should be reminded of the quote by Maya Angelou when she said: "I've learned that people will forget what you said, people will forget what you did, but people will never forget how you made them feel" (Maya Angelou quotes, n.d.).

Interestingly, the lowest rated item was *willing to discuss personal problems*, which may be considered similar in nature to the constructs which students rated the highest. Could this finding indicate students desire to maintain a professional relationship with their faculty advisor? This could be a reflection that many students will seek personal advice from friends and family. Items relating to professional needs, including educational opportunities and career related knowledge were rated higher.

Students selected *communicates degree requirements* as the most important academic advising characteristic. This indicates that although students desire an advisor who is available and approachable, it is still critical they are familiar with degree requirements and able to assist students in meeting the graduation requirements. Myers and Dyer (2003) found faculty advisors in colleges of agriculture identified their three most important roles as dealing with degree requirements, career counseling, and course scheduling. Conversely, the least important advising roles identified by Myers and Dyer were assisting with student organizations, helping students prepare for activities/competitions, and addressing personal issues. It seems as though the perceptions faculty advisors in that particular study are comparable with the importance ratings of students in this study; however, how would the respective faculty advisors compare?

Students rated faculty performance on each advising construct as satisfactory or better, indicating overall satisfaction. Advisor performance on the Availability/Accessibility and Personable/Approachable constructs was rated higher than performance on the Knowledge/Helpfulness and Counseling/Mentoring constructs. Each of the mean performance ratings within the Availability/Accessibility construct exceeded 4.20. Based on such ratings, one could presume that students, on average, are indeed satisfied with their faculty advisor's punctuality, response time, and the amount of time allotted for appointments. Students' ratings of faculty advisors within the Personable/Approachable construct suggest that students are generally comfortable seeking assistance from their faculty advisor and feel respected and supported. This contradicts Belcheir's (1998) study in which some students reported feeling like "just another face" to their advisor.

Performance ratings for the Knowledge/Helpfulness construct indicated that faculty advisors are encouraging academic success, communicating degree requirements, and providing information about general education courses. However, items relating to employment (both on-campus and after graduation), financial assistance, academic resources and study skills improvement are lacking in comparison. Could this be because faculty advisors are more informed about technical, degree specific requirements and less familiar with more general campus-related topics? Or, could this indicate that many advisors tend to embrace a more prescriptive approach to advising students? Upcraft and Stephens (2000) indicated that many college students struggle to finance their college education. If faculty advisors are not able to effectively assist in this area by suggesting financial resources or assisting in obtaining an on-campus job, where will students get the help they need?

Performance ratings for the Counseling/Mentoring construct suggest students are relatively pleased with their involvement in planning their academic program and their advisor's performance in selecting courses that align to their interests. However, the two lowest performance ratings in this construct were for *suggests strategies to cope with academic challenges* and *willing to discuss personal problems*. Such ratings indicate that advisors could improve advising performance by becoming more knowledgeable about strategies and services available to assist students experiencing academic challenges and by demonstrating a concern for students' personal issues as well as academic issues. McCollum (1998) reiterated the importance of acknowledging students' emotional needs through advising.

The modified Borich needs assessment model classified the ten academic advising characteristics with greatest discrepancy scores into Category I. This categorization indicates that faculty advising in the College could be enhanced. According to students, the top rated academic advising characteristic in need of enhancement is *assists in identifying potential areas of employment after college*. Additional items that surfaced as potential areas for enhancement include: *provides information about obtaining financial aid*, *aware of my academic progress*, *provides information about educational opportunities beyond my Bachelor's degree*, and *suggests strategies to cope with academic challenges*. Upon close analyses of the items in Category I, it may be suggested that faculty in the College are provided with professional development related to their roles as faculty advisors. As Wilbur (2003) indicated, few faculty members feel prepared for their role as advisors and research indicates formal training for faculty advisors is quite limited (Dyer & Myers, 2005; Habley, 1997; Peiter-Hortsmeier, 2006). Specifically, special attention should be placed upon the role faculty advisors can play as a liasion/referral agent (Cuseo, 2008). In this role, which is a component of the Knowledge/Helpfulness construct, faculty advisors serve as students' connection to academic support and student development resources (Cuseo).

As a result of this study, the following recommendations, in practice and research, were made. Although the findings of this study indicated that, in general, faculty advisors were doing quite well, numerous opportunities for faculty professional development exist. Such an investment of time and resources may yield big dividends, in terms of student satisfaction, increased retention and improved graduation rates.

The American Association for Agricultural Education (AAAE) recognized the value of research in this area in its *National Research Agenda* (Osborne, n.d.). According to the document, research should be conducted that aims to “improve the success of students enrolled in agricultural and life sciences academic and technical programs,” “enhance the effectiveness of agricultural and life sciences faculty,” and “assess the effectiveness of educational programs in agricultural and life sciences” (p. 7). Each of these areas relates to faculty advising. Therefore, several recommendations are also being made for further evaluation and research relating to academic advising.

Certainly, continued assessment and evaluation of faculty advising is essential. Although annual student evaluations of academic advising provide valuable information for faculty members and administrators, are there other types of assessment that could be utilized? Creamer and Scott (2000) recommend utilizing self-evaluation, supervisory performance review and peer reviews of academic advising.

Another recommendation for further research involves assessing faculty advisors perceptions of students’ needs and how well they feel they are fulfilling them? Such a study would allow a comparison of students and faculty advisor perceptions of advising and help to determine what additional needs could be addressed through faculty development initiatives. The inclusion of additional research methodologies, including qualitative research, also would offer the potential to gain more in-depth information about faculty advising. Specifically, focus groups of students and faculty advisors could provide beneficial insight as to differing needs and expectations for academic advising.

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Utilizing Natural Cognitive Tendencies to Enhance Agricultural Education Programs

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The influences of cognitive styles have been the focus of research on problems in education for quite some time (Witkin, Moore, Goodenough, & Cox, 1977). In fact, agricultural educators are rapidly increasing the amount of research and education focused on understanding and utilizing cognitive function in an attempt to improve educational programs. The purpose of this study was to describe the relationships between three measures of cognitive function: critical thinking disposition, problem solving style, and learning style when participants are encouraged to engage in their natural cognitive tendencies by being placed in an intense environment. These three cognitive styles/dispositions were measured and analyzed for correlations. Substantial relationships were discovered. Cognitive abilities and preferences are repeatedly taken in to account when creating and revising educational programs to enhance student learning. With a greater understanding of how cognitive dispositions relate to one another, a clearer vision of student preferences and abilities can be taken in to account when creating educational curricula and activities.

Introduction

Research on problems in education has been focusing on the influences of cognitive styles in formal and non-formal education settings for quite some time (Witkin, et al., 1977). Keefe (1979) defined cognitive styles as a learner's preferred way of organizing and retaining information. Critical thinking ability has been recurrently identified as a cognitive style necessary for students in the 21st century and crucial for individuals to be able to deal with decisions faced every day (Myers & Dyer, 2006; Torres & Cano, 1995). Along with critical thinking, problem solving style and learning style are the primary cognitive styles being examined within agricultural education. In fact, agricultural educators are rapidly increasing the amount of research and education focused on understanding and utilizing cognitive function in an attempt to improve their programs.

Critical thinking ability is essential to student success; however, ability constantly changes as students learn and grow and is therefore extremely difficult to measure. By using critical thinking dispositions, which Irani et al. (2007) have identified as "the gateway through which one allows the mind to engage in critical thinking activity," (p. 2) a deeper, slowly changing preference rather than ability becomes the unit of measurement. These dispositions are measurements agricultural educators can use when assessing students and creating educational curriculum.

Critical thinking disposition, problem solving style, and learning styles have all been examined individually by agricultural educators with the results focused on how they can be used to enhance student learning (Boone, 1990; Cano, 1993, 1999; Cano & Martinez, 1991; Dyer & Osborne, 1996a, 1996b; Garton, Spain, Lamberson, & Spiers, 1999; Parr & Edwards, 2004; Rudd, Baker, & Hoover, 1998; Torres & Cano, 1994). In addition, cognitive relationships between critical thinking disposition and problem solving style, and critical thinking disposition and learning style, have been studied (Friedel, Irani, Rhoades, Fuhrman, & Gallo, 2008; Myers & Dyer, 2006; Rudd, Baker, & Hoover, 2000; Torres & Cano, 1995). However, all three have not been examined within the same context to gain an understanding of how they relate to one another. Since assessing the effectiveness of educational programs in agricultural and life sciences and improving the success of students enrolled in agricultural and life sciences academic and technical programs is part of the National Research Agenda: Agricultural Education and Communication, 2007-2010 (Osborne, n.d.), a study exploring the ways in which natural cognitive function correlate and can be used to enhance student learning through enhanced agricultural education programs can yield valuable data providing direction for future practice.

Theoretical Framework

The conceptual framework for this study was created using theories that provide the foundation for the three cognitive styles being examined.

Critical Thinking Disposition

Critical thinking is a concept that has been challenging to define as exhibited by the many definitions available. Sumner (1940) defined critical thinking as "the intellectual processes by which the sense, sequence, interdependence, and rational consequences of facts are ascertained" (p. 32). A more current definition as stated by Rudd et al. (2000) is "a reasoned, purposive, and introspective approach to solving problems or addressing questions with incomplete evidence and information, and for which an incontrovertible solution is unlikely" (p. 5). No matter the definition, critical thinking has been recognized as one of the most important cognitive traits leading to an individual's success for quite some time (Sumner; Irani, et al., 2007).

Facione (1990) was the first to attempt to describe dispositions as they pertain to critical thinking by conducting a Delphi study using top researchers in the field. Seven separate dispositions were identified (Facione). While conducting a factor analysis of the California critical thinking disposition inventory, Moore, Rudd, and Penfield (2002) found the dispositions identified by Facione in 1990 were not represented. In an attempt to more accurately measure critical thinking disposition, Irani et al. (2007) used the Delphi study results and a review of literature in the field of critical thinking to create a new instrument, the UF-EMI.

The UF-EMI (2007) uses three constructs rather than seven: engagement, cognitive maturity, and innovativeness. A high engagement score signifies an ability to anticipate situations, look for opportunities to use reasoning skills, and confidence in reasoning, decision making and problem solving abilities (Irani et al.). A high cognitive maturity score signifies a knowledge of predisposition prior to making decisions, recognition of the environment's effect on opinions and an openness to the ideas of others. A high innovativeness score signifies a tendency to look for new knowledge, engage in new challenges, seek more knowledge, and an ability to question present beliefs, adjusting them based on new knowledge or experience.

Problem Solving Style

Kirton (2003) defined problem solving as an ability to "solve critical, complex problems in challenging environments" (p. 1). Since the world is ever-changing, problem solving becomes an essential part of human survival and is innate within each individual (Kirton). However, individuals approach problem solving differently. Adaption-Innovation theory (Kirton) asserted as an individual's style can be identified on a continuum between levels of adaption and innovation. An adaptive individual narrowly focuses their attention to solving a problem within defined boundaries. An innovative individual approaches problems from a larger perspective, stepping outside of boundaries or defying rules to come up with multiple solutions to the same problem. In order to analyze adaptive versus innovative style, the KAI was created using three constructs: sufficiency of originality (a preference for forming solutions), efficiency (a preference to use strategy), and rule/group conformity (a preference for structure).

Learning Style

The experiential learning theory of development defines learning style as an individual's preferred method of gaining knowledge. In Kolb's (1984) learning style model, learners are divided in to four categories: accommodating, assimilating, converging, and diverging. These four styles were created by evaluating the level at which the learner naturally tends to use reflective observation (reflecting), abstract conceptualization (thinking), active experimentation (doing), and concrete experience (experiencing) while learning (Kolb, 2007). A higher score in each of these areas signifies a preference for that style of learning.

Kolb (2007) identified typical characteristics associated with each of the four groups. Those preferring doing and experiencing are considered accommodators. They put practiced ideas into action, finding multiple uses for information learned, and are easily adaptive. Those who prefer reflection and thinking are considered assimilators. They see learning experiences as a gateway to larger ideas combining learned information to create models and theories. Those who prefer doing and thinking are considered convergers. They collect information to solve problems, bringing pieces together to reach a solution. Those preferring experiencing and reflecting are considered divergers. These individuals look at situations from multiple perspectives coming up with alternative solutions by diverging from traditional patterns.

Critical Thinking Disposition, Problem Solving Style, & Learning Style

Past research has shown critical thinking disposition and problem solving style may be linked through creative thinking. Studies have identified creative thinking as an essential part of critical thinking (Maltzman, 1960; Newell et al., 1962; Russell, 1956; Torrance & Torrance, 1973; Vinacke, 1952). At the same time, there is some debate as to whether creative thinking and problem solving are significantly different concepts. Kirton (2003) argued that problem solving style does not differentiate whether an individual is creative or not, but rather the differences in the way they express their creativity. Therefore, if creativity is not the link between problem solving and critical thinking, how are they related? Friedel et al. (2008) found low levels of correlation between critical thinking and problem solving, but concluded the two are probably more independent than previously thought.

Relationships between critical thinking disposition and learning style have also been examined within the field of agricultural education. While studying this relationship in undergraduate students, Rudd et al. (2000) reported no significant correlation between learning style and critical thinking disposition. Torres and Cano (1995) also expressed the need for further study when they discovered learning style only accounted for 9% of the variance in critical thinking ability.

Relationships between problem solving style and learning style were found in the management training context (Kirton, 2000). In these studies, reflection was associated with adaptors while action was associated with innovators. If this serves to be true, adaptors will prefer linear learning modes, and innovators will prefer hands on, experiential learning techniques (Kirton). A higher score within each of the three KAI constructs, sufficiency of originality, efficiency, and rule/group conformity, signifies an innovative preference, while a low score signifies an adaptive preference towards problem solving.

Purpose and Objectives

The purpose of this study was to describe the relationships between participant's critical thinking disposition, problem solving style, and learning style. The research objectives were to:

1. Describe the participants' critical thinking disposition, problem solving style, and learning style.
2. Describe the relationships between the participants' critical thinking disposition, problem solving style, and learning style.
3. Create a conceptual model describing the relationships existing between critical thinking disposition, problem solving style, and learning style.

Methods

The study presented here was descriptive and correlational in nature. The population used for this study was made up of participants in two study abroad courses conducted during the summer and fall 2009 terms. Both were designed to remove the participants from their comfort zone. When individuals find themselves engaged in unfamiliar activities, coping behavior is activated, creating an environment that relies on preferred cognitive style to develop the needed behavior (Kirton, 2000). In addition, experiential learning was the teaching methodology used, with learning activities designed to stimulate participants possessing a variety of learning styles. The courses included cultural immersion techniques and problem solving activities. Together, these influences created an atmosphere designed to enhance the use of all three cognitive areas studied. With only 15 participants in one course and 13 in the other, a census of the 28 college age students involved was conducted. Due to the small size of the population, the results cannot be extrapolated beyond the limits of the environments described within this study.

Participants met with one of the researchers at the conclusion of both courses where they were asked to complete three assessments. These included the University of Florida Engagement, Maturity, and Innovativeness test (UF-EMI; Moore, Rudd, & Pennfield, 2002) to measure critical thinking disposition, Kirton's Adaption-Innovation Inventory (KAI; Kirton, 1976) to determine their problem solving style, and the Kolb Learning Style Inventory (LSI; Kolb, 2007) to determine learning style. Demographic data was also collected for descriptive purposes.

Instrumentation

To assess critical thinking disposition, the UF-EMI was used. This instrument was made up of 26 Likert-type items measuring the three constructs of critical thinking: engagement, cognitive maturity, and innovativeness (Irani et al., 2007). The total score on the instrument ranges from 26, indicating a low critical thinking disposition, to 130, indicating a high critical thinking disposition. Total reliability for the UF-EMI, as reported by the developers, was a Cronbach's alpha coefficient of .937 (Irani et al.). Cronbach's alpha coefficients for the three constructs within the instrument are: engagement, .906; cognitive maturity, .787; and innovativeness, .797.

The KAI was used to assess problem solving style. The KAI was a 32-item instrument. Reponses were totaled to create an overall score ranging from 32 to 160 (Kirton, 2003). Individuals scoring below 95 points were considered adaptors and those scoring above 95 were considered innovators. The KAI was also made up of three constructs: sufficiency of originality (a preference for forming solutions), efficiency (a preference to use strategy), and rule/group conformity (a preference for structure). Multiple research studies have established a high level of reliability and validity for this instrument (Kirton). In addition, numerous researchers have replicated high levels of reliability for the KAI, reporting Cronbach's alpha coefficients ranging from .80 to .90 (Taylor, 1989).

Learning style was determined by using the LSI. This 12-item instrument is used to determine learning style preferences within four categories: concrete experience (CE), active experimentation (AE), reflective observation (RO), and abstract categorization (AC). Each category had a score ranging from 12 to 48, with all four categories totaling 120. Categories with higher scores signified preference for this method of learning. Multiple research studies across disciplines have established a coefficient alpha level of reliability for the LSI ranging from .73 to .86 (Ruble & Stout, 1990).

Data Analysis

Descriptive statistics were used to calculate the first objective. Responses for all three inventories were coded for computer analysis using SPSS. Relationships between the participant's critical thinking disposition, problem solving style, and learning style were described by calculating Pearson's product-moment correlation coefficient using Davis' (1971) convention. Magnitude of the relationship is noted by Davis as $.01 \geq R \geq .09$ = Negligible, $.10 \geq R \geq .29$ = Low, $.30 \geq R \geq .49$ = Moderate, $.50 \geq R \geq .69$ = Substantial, $R \geq .70$ = Very Strong. Proportion of the variation accounted for by the relationship is noted by R^2.

Results

Demographics

The 28 participants recruited to take part in this project represented the University of Florida, Texas A & M, North Carolina State University, Purdue University, and the Ohio State University. Twenty-one of the participants were female and seven were male, ranging in age from 18 to 27 years of age. Twenty-four participants were undergraduate students (86%) and four were graduate students (14%). Twenty-six of the participants were White (non-Hispanic), one was Hispanic, and one was Caribbean.

Critical Thinking Disposition

The UF-EMI inventory was used to identify the participants' critical thinking disposition. The total score on the instrument ranges from 26, indicating a low critical thinking disposition, to 130, indicating a high critical thinking disposition. Participant scores reflected a range of critical thinking disposition scores, ranging from 43 to 119. Twelve had a score over 100 on the inventory, signifying a higher critical thinking disposition while sixteen scored a 100 or below, signifying a lower critical thinking disposition.

Problem Solving Style

The KAI inventory was administered to measure problem solving style. Using this instrument, scores within each category are summed to create a total score ranging from 32 to 160 (Kirton, 2003). Individuals scoring below 95 points are considered adaptors and those scoring above 95 are considered innovators. In this study participant scores ranged from 76 to 127. Seventeen participants were identified as innovators and eleven as adaptors.

Learning Style

The LSI was used to measure the participants' preferred learning style. Numerical measures are taken in each of the four categories: abstract categorization, active experimentation, concrete experience, and reflective observation. Reflective observation scores are subtracted from the active experimentation score to get an overall score representing how the person does things while learning. In addition, the concrete experience scores are subtracted from the abstract categorization scores to get an overall score representing how the person thinks about things while learning. These two scores are the mapped out on a grid to attain the individual's preferred learning style based on how the two score interact (Kolb, 2007). The participants in this study represented each of the four categories. Seven were identified as accommodating, eight as assimilating, five as converging, and eight as diverging.

Relationships between Critical Thinking Disposition and Problem Solving Style

There were moderate correlations between participants' critical thinking disposition and their problem solving style (see Table 1). The overall UF-EMI score had a moderate correlation (R = .36) with the overall KAI score accounting for over a tenth of the effect (R^2 = .13). The cognitive maturity construct within the UF-EMI also had a moderate correlation (R = .47, R^2 = .22) with the overall KAI score, a substantial correlation with the rule/group conformity construct within KAI (R = .54, R^2 = .29), and a moderate correlation with the efficiency construct within KAI (R = .42, R^2 = .18). The innovativeness construct within the UF-EMI also had a moderate correlation (R = .30, R^2 = .09) with the overall KAI score, a moderate correlation with the efficiency construct within KAI (R = .47, R^2 = .22), and a moderate correlation with the rule/group conformity construct within KAI (R = .41, R^2 = .17). The engagement construct within the UF-EMI also had a moderate correlation with the rule/group conformity construct within KAI (R = .39, R^2 = .15). Two of the constructs within the KAI were moderately correlated to the overall UF-EMI score. The rule group conformity construct had a moderate correlation (R = .47, R^2 = .22) and the efficiency construct had a moderate correlation (R = .42, R^2 = .18).

Table 1
Correlations between Critical Thinking Disposition and Problem Solving Style

	Overall KAI	SO	E	R
Overall UF-EMI	.36	.08	.33	.47
Cognitive Maturity	.47	.19	.42	.54
Innovativeness	.30	.04	.47	.41
Engagement	.27	.01	.27	.39

Note. SO=Sufficiency of Originality, E=Efficiency, R=Rule/Group Conformity

Relationships between Critical Thinking Disposition and Learning Style

When LSI preferences are viewed in comparison to total scores on the UF-EMI, those exhibiting an accommodating learning style tended to have a lower critical thinking disposition score (see Table 2). In addition, those with a converging learning style preference exhibited a higher critical thinking disposition score. Those exhibiting either an assimilating or diverging learning style had a range of total critical thinking disposition scores.

Table 2
Learning Style Preference Comparisons with Problem Solving and Critical Thinking Scores

Participant #	Inventory Preference	Total EMI Score	Total KAI Score
20	Accommodating	100	85
18	Accommodating	100	78
13	Accommodating	94	110
26	Accommodating	94	82
15	Accommodating	92	106
9	Accommodating	93	83
27	Accommodating	89	98
1	Assimilating	113	118
3	Assimilating	109	123
17	Assimilating	104	108
6	Assimilating	103	108
2	Assimilating	100	92
19	Assimilating	92	89
16	Assimilating	92	84
23	Assimilating	64	106
28	Converging	119	121
11	Converging	107	111

10	Converging	104	125
12	Converging	104	107
7	Converging	104	85
24	Diverging	106	127
5	Diverging	105	120
22	Diverging	102	102
14	Diverging	100	94
4	Diverging	98	101
8	Diverging	92	76
25	Diverging	90	105
21	Diverging	43	93

Only one of the constructs within the LSI had moderate correlations to the UF-EMI (see Table 3). The active experimentation construct moderately correlated to the overall UF-EMI score (R = -.38, R^2 = .14) accounting for almost 15% of the variation. This construct also moderately correlated with the engagement construct (R = -.42, R^2 = .18), the cognitive maturity construct (R = -.32, R^2 = .10), and the innovativeness construct (R = -.32, R^2 = .10) within the UF-EMI.

Table 3
Correlations between Critical Thinking Disposition and Learning Style

	AC	AE	RO	CE
Overall UF-EMI	.02	-.38	.03	-.08
Engagement	.12	-.42	.11	-.11
Cognitive Maturity	-.09	-.32	.00	-.01
Innovativeness	-.03	-.32	-.07	-.12

Note. AC = Abstract Categorization, AE = Active Experimenation, RO = Reflective Observation, CE = Concrete Experience.

Relationships between Problem Solving Style and Learning Style

When learning style inventory preferences were viewed in comparison to total scores on the KAI, there are no obvious relationships (see Table 2). The total KAI scores varied within each learning style preference. Strong correlations between the participant's problem solving style and the constructs within the learning style inventory were not found (See Table 4).

Table 4
Correlations between Problem Solving Style and Learning Style

	Overall KAI	SO	E	R
Active Experimentation	-.15	-.01	-.17	-.21
Abstract Categorization	.10	.10	.01	.11
Reflective Observation	-.25	-.29	-.10	-.21
Concrete Experience	.29	.23	.29	.22

Note. SO=Sufficiency of Originality, E=Efficiency, R=Rule/Group Conformity

Using the theoretical framework of the cognitive styles identified: critical thinking disposition, problem solving style, and learning style along with the results from this study, a conceptual model representing the relationships between the three styles was developed (see Figure 1). While it may be premature to develop a model based on such a small population, the development process connected the correlations in a visual way. This process also created a unique vision of how cognitive styles relate that can be further tested.

The results show problem solving style is correlated with critical thinking disposition. The conceptual model shows those with higher critical thinking disposition scores will most likely be innovators while those with a lower critical thinking disposition score will most likely be adaptors. Individuals with a higher critical thinking disposition were also correlated to those exhibiting a converger preference when learning while those with a lower critical thinking disposition were correlated with those exhibiting accommodator preferences while learning. The conceptual model reflects this relationship as well. Problem solving style and learning style were not found to be correlated therefore they are only shown to be connected through critical thinking disposition. This study shows how connections between multiple aspects of cognitive style remain hidden until applied to the same group, at the same time, and gives further insight in to the relationships between critical thinking disposition, problem solving style, and learning style.

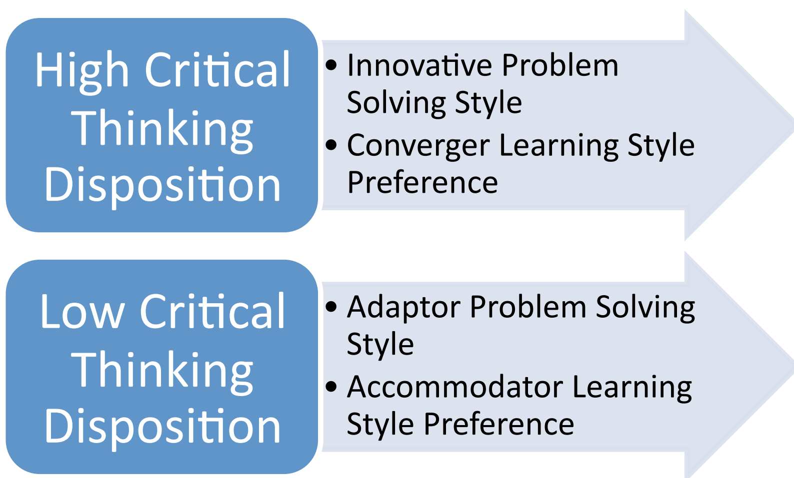

*Figure 1***.** A conceptual model of the relationships between critical thinking disposition, learning style, and problem solving style based on the study.

Conclusions

This study sheds light on how critical thinking disposition, problem solving style, and learning style relate to one another. The main limitation of the study was the use of a census. As such, the results reported were population parameters and cannot be extrapolated beyond the limits of the environment described within the study.

Based on previous research, adaptors would have exhibited a preference for linear learning modes, while innovators should have preferred hands on, experiential learning techniques (Kirton, 2003). While the literature suggested a relationship existed between problem solving style and learning style, the results from the group of students in this study showed a relationship between problem solving style and learning style did not exist.

A relationship did exist between problem solving style and critical thinking disposition in this study. Having only found low levels of correlation between critical thinking and problem solving, Friedel et al. (2008) concluded the two were more independent than originally thought. However, when separate constructs were included in this comparison, it revealed those holding an innovative preference for forming solutions and dealing with structure while problem solving tended to have a higher critical thinking disposition. This is especially true as it relates to the individual's ability to acknowledge their own predisposition when thinking critically and their ability to recognize how their environment can have an effect on the way they think.

The most unexpected result of the study was the identification of a relationship between critical thinking disposition and learning style. In previous studies, Rudd et al. (2000) found no significant correlations between learning style and critical thinking disposition and Torres and Cano (1995) discovered learning style only accounted for a very small portion of the variance in critical thinking. While the overall critical thinking disposition and overall learning style were not strongly correlated within this study, connections between the active experimentation construct and critical thinking score existed. Those individuals with a strong preference for abstract categorization (thinking) and active experimenation (doing) when learning had a very strong relationship to those who anticipate situations, look for opportunities, and are confident in their abilities when thinking critically.

Implications & Recommendations

The key implication for agricultural educators working to enhance educational programs is to be aware of, and address, the connections between different cognitive dispositions and styles. Critical thinking ability has been recurrently identified as a cognitive style necessary for students to be successful in today's workplace (Myers & Dyer, 2006). This study shows there are connections between innovative problem solvers and a high critical thinking disposition. It also shows those with a strong preference for abstract categorization (thinking) and active experimenation (doing) when learning had a very strong relationship with several critical thinking items. While students exhibiting these characteristics are naturally setting themselves up for success outside of school, educators need to be aware of, and pay attention to the need to stress critical thinking skills with students who do not exhibit these tendencies. If critical thinking skills are demanded by employers, educators need to consider implementing strategies that focus on skill building in this area such as integrating more ill-defined problems in their courses.

Cognitive abilities and preferences are repeatedly taken in to account when creating and revising educational programs to enhance student learning. This study shows innovative problem solvers are highly engaged when asked to critically assess a situation. In addition, these individuals will react to learning strategies targeted at doing and thinking, fitting in with the converging learning style. With a greater understanding of how cognitive dispositions relate to one another, a clearer vision of student preferences and abilities can be taken in to account when creating classroom activities.

Additional research measuring future participant's cognitive abilities in similar study abroad courses would assist in determining if the results found here are localized to this population. In addition, research examining whether or not the context of the courses had an effect on these relationships could be useful. A similar study conducted with individuals of similar demographic make-up involved in typical, everyday activities would be a way to examine whether or not the influence of the international environment had an effect.

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A Case Study Examining the Impact of Cognitive Load on Reflection and Pre-Service Teachers' Transfer of Specific Teaching Behaviors

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Abstract

The purpose of the study was to describe the reflective experiences of pre-service teachers and determine how cognitive load impacts reflection. Twenty-seven Career and Technical Education pre-service teachers were randomly placed into 14 teaching teams. The teams taught a pre-written lesson which was videotaped. After the lessons were taught, groups were asked to reflect upon their teaching while viewing the video. Seven groups were randomly assigned to an experimental group whose reflective experience was designed to create higher cognitive load and the remaining seven assigned to a control group whose reflective experience was designed with less cognitive load. Participants engaged in focus group interviews after the second round of teaching. Five significant themes emerged: reflection in general, video reflection, reflection on questioning, impact of load, and change in behavior. Sixteen sub-themes were identified and are discussed in this paper. Based upon the findings, the researchers recommend that: (1) teacher preparation programs continue providing pre-service teachers with reflective experiences, (2) video technology should be incorporated when asking pre-service teachers to reflect, (3) reflective experiences should consider cognitive load, and (4) pre-service teachers should be not asked to reflect upon multiple teaching constructs at once.

Introduction

Reflection is a vital component in teacher preparation programs nationwide, and for good reason (The Association of Teacher Educators, 2003; Hatton & Smith, 1995). Perhaps Zeicher said it best: "There is no such thing as an unreflective teacher" (Zeicher, 1996, p. 207). The process of reflection is described as a beneficial practice for teachers, and reflection is identified as an "academic virtue and source of privileged knowledge" (Fendler, 2003, p. 16). Therefore, the need for reflective educators emerges.

The benefits and methods of reflection have been researched and documented. Pre-service teachers participate in a variety of reflective activities including reflective journaling, peer teaching demonstrations, case studies, and action research projects. The addition of video technology to self-reflection is a useful tool that promotes teacher development and is an appropriate method for self-reflection (McCurry, 2000; Ovens & Tinning, 2009). Reflection has specifically been identified as a method that increases the frequency in which pre-service teachers ask higher-order thinking questions (Epler & Broyles, 2009). Clearly, reflection is beneficial to pre-service and in-service teachers alike.

Teacher education literature emphasizes the need for reflection of pre-service teachers (Howard, 2003). Osborne (2007) states in the National Research Agenda for Agricultural Education and Communication that "case studies which identify strategies for creating a culture of professional development, reflection, and continuous improvement" for agricultural educators should be conducted (p. 18). With an emphasis placed upon reflection, it is important to consider the nature of reflective experiences for pre-service teachers. Are reflective experiences constructed in manners that maximize depth of thinking and ultimately higher-level learning? Do reflection experiences ultimately lead to a change in teaching behaviors and skills? Are the reflective experiences of pre-service teachers too overwhelming, and are the experiences unintentionally constructed in way that limits the effectiveness of the experience?

Theoretical Framework

Reflection

The term "reflection" is commonly used throughout educational arenas. More specifically, terms such as "reflective practitioner," "reflection-in-action," "reflection-on-action," and "reflective teaching" are commonly referenced in the teacher preparation and professional development literature (Griffiths, 2000; Schön, 1983). Although the nuances for the terms vary, the central idea of each remains the same. Reflection is a "suggested way of helping practitioners better understand what they know and do as they develop knowledge of practice through reconsidering what they learn in practice" (Loughran, 2002, p. 33). Reflection places an emphasis on learning from doing, and often, the process is viewed as critical for maintaining one's "professional health" and competence (Loughran, 2002). In fact, reflection plays central role in many teacher preparation and teacher induction programs and is regarded as a valuable component in the professional development process.

John Dewey, a key originator of the concept of reflection, considered reflection as a problem solving process. Dewey refers to reflection action as being "based on the active, persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it" (1933, p. 9). Reflection is identified as a mode of thought and categorized as a specialized type of thinking. Reflective thinking cannot be compared with simply "thinking things over" (Rodgers, 2002). Such thinking is described as "undisciplined" (Rodgers, 2002, p. 849). The reflective process begins when a person encounters an experience. The experience involves "(1) a state of doubt, hesitation, perplexity, mental difficulty, in which thinking originates, and (2) an act of searching, hunting, inquiring to find material that will resolve the doubt, settle and dispose of the perplexity" (Dewey, 1933, p. 12). The demand for a solution is the central and "guiding factor in the entire process of reflection" (Dewey, 1933, p. 14). When a person faces a question that needs answered, the process has a defining end point. "The nature of the problem fixes the end of thought, and the end controls the process of thinking" (Dewey, 1933, p. 15). Thus, the process of reflection is broken down into phases. Dewey's phases of reflection clearly mirror the scientific method. Rodgers (2002, p. 851) summarized the six phases of reflection that consistently appear in Dewey's writings. The phases include (1) an experience, (2) spontaneous interpretation of the experience, (3) naming the problem (s) or the question (s) that arises out of the experience, (4) generating possible explanations for the problem (s) or questions (s) posed, (5) ramifying the explanations into full-blown hypotheses, (6) experimenting or testing the selected hypothesis.

Teacher preparation programs are challenged with transforming pre-service teachers into "reflective practitioners." Numerous commissions, boards, and task forces have identified reflection as a central goal for all teachers. In fact, the National Board for Professional Teaching

Standards (NBPTS) identifies exemplary teachers as being able to “think systematically about their practice and learn from experience” (National Commission on Teaching and America’s Future, 1996, p. 84). Drawing upon Schön’s description of reflection that is intimately bound with action, a method that helps pre-service teachers become reflective practitioners is described as “reflective teaching.” Reflective teaching is associated with the idea of growth through “critical inquiry, analysis, and self-directed evaluation” (Calderhead, 1987, p. 36). Schön emphasizes that professionals should learn to “frame and reframe the often complex and ambiguous problems they are facing, test out various interpretations, and modify their actions as a result” (Hatton & Smith, 1995, p. 34). With this in mind, reflective teaching encompasses more than just the cognition involved in teaching, but includes metacognitive processes as well. Because learning to teach involves complex interactions between cognitive and metacognitive processes, reflective teaching is a method that aligns with reflection as a valuable learning experience for teachers (Calderhead, 1987). Teachers use reflection as a means for understanding the nature of their teaching. Drawing upon Dewey’s phases of reflection, teacher preparation programs should formulate experiences for pre-service teachers to critically reflect and improve upon their teaching by generating and testing hypotheses related to individual teaching experiences.

Cognitive Load

When examining pre-service teacher reflection, researchers must also investigate cognitive load theory (CLT). Cognitive load is defined as a “multidimensional construct representing the load that performing a particular task imposes on the learner’s cognitive system” (Paas & van Merrienboer, 1994, p. 353). Cognitive load theory assumes that the human cognitive architecture includes a very limited working (or short-term) memory. Working memory is used for conscious activities, and it is the only memory that a learner can monitor (Kirschner, 2002). According to Miller (1956), short-term memory is limited to approximately seven (plus or minus two) items of information at once. Kirschner further clarified stating that learners can “probably only process two or three items of information simultaneously as opposed to holding that information” (2002, p. 2). Additionally, it is noted that the limited working memory can combine, contrast or manipulate between two to four elements simultaneously (Kirschner, 2002; Schnotz & Kurschner, 2007; Sweller & van Merrienboer, 2005;). Simply put, working memory is not able to process many elements. Because working memory is limited in capacity, issues with cognitive load appear.

The development of CLT began in the late 1970s while examining how students solve problems (Schnotz & Kurschner, 2007). Problem solving is especially demanding on working memory capacity (Sweller, 1988). Sweller used trigonometry problems to illustrate the demands of problem solving on working memory. The large amount of working memory on available capacity led him to conclude that traditional instructional strategies that stress many specific problems do not provide an effective way to learn. Essentially, the use of means-end analysis forces learners to hold the current problem state, the goal state, any sub-goal states, and the relation between these states continuously in working memory, and in turn, results in little learning (Schnotz & Kurschner, 2007). Thus, the concept of cognitive load was introduced as an explanation of why little (if any) learning occurred in such situations.

Theoretically, cognitive load consists of causal factors and assessment factors. These factors reflect an interaction between task and learner characteristics and an assessment dimension that reflects measurable concepts. Causal factors are factors that cause cognitive load and assessment factors are factors that are affected by cognitive load (Paas & van Merrienboer, 1994). Casual factors include characteristics of the subject (i.e. cognitive ability, prior knowledge, cognitive style, preference), the task (i.e. task complexity, novelty, time pressure, reward system), the environment (i.e. noise, temperature, etc.), and subject/task/environment interactions (Paas & van Merrienboer, 1994).

Assessment factors are the three measurable dimensions of CLT, which can include mental load, mental effort, and performance. Mental load is the portion of cognitive load that originates from task and subject interactions, and provides an "indication of the expected cognitive load that refers to the cognitive capacity demands and can be considered an a priori estimate of the cognitive load" (Paas, Touvinen, Tabbers, & Van Gerven, 2003, p. 64). Mental effort refers to the amount of cognitive capacity a learner actually allocates to specific tasks, and performance can be defined as a learner's achievements. Examples of performance achievements can include the number of items correct, the number of errors, or even time on task (Kirschner, 2002; Paas, & van Merrienboer, 1994; Paas et al., 2003).

Researchers have identified three types of cognitive load: intrinsic, extraneous, and germane cognitive load (Paas & van Merrienboer, 1994). Intrinsic cognitive load is determined by the interaction of task or subject characteristics. In other words, intrinsic cognitive load is impacted by the difficulty of the task and the material being learned. Extraneous cognitive load is the cognitive load which results mainly from poorly designed learning experiences. Finally, germane cognitive load is the load related to processes that promote the construction and storage of schemata (Kirschner, 2002; Paas & van Merrienboer, 1994; Paas et al., 2003). Cognitive load is a crucial factor in the learning of complex tasks. In most cases, cognitive load is not viewed as a mere by-product of learning, but plays a major role and quite often, determines the success of instructional interventions (Paas et al., 2003). High cognitive load can even have negative impacts on learning.

Purpose and Objectives

Because individuals can process a limited amount of information simultaneously, issues with cognitive load emerge. In fact, learning experiences that do not attempt to minimize cognitive load impact the learning that occurs. With this in mind, several questions emerge related to reflection. Are the reflective experiences for pre-service teachers designed with cognitive load in mind? Do reflective experiences that create higher cognitive load impact (or even negate) the learning that can occur through reflection? Because of the limited nature of working memory, the researchers theorize that higher cognitive load will reduce depth of reflection. Therefore, the overall objective for this study was to examine if an increase in cognitive load impacts the reflection experience of pre-service teachers. The specific objectives were to:

1. Describe how reflective experiences within a teacher preparation program contribute to the development of pre-service teachers.

2. Examine the impact that reflection has on the transfer and learning of specific teaching skills (i.e. the frequency of asking higher-order thinking questions).
3. Describe the impact that higher or lower cognitive load has on the reflection process of pre-service teachers

Methodology

Participants were pre-service teachers enrolled in a Career and Technical Education master's program. The teacher preparation program meets the requirements set forth by the state department of education, and at the completion of the program, participants will have earned a teaching license in Agricultural Education, Business and Information Technology, Family and Consumer Sciences, or Marketing Education. All participants hold a Bachelor's degree within their specific discipline. There were twenty-seven participants. Fifty percent of the participant's primary emphasis is Business and Information Technology or Marketing Education. Over 40 percent (42.8%) of the participant's primary emphasis is Agricultural Education and one participant's primary emphasis is Family and Consumer Science Education.

To address the research objectives, the researchers selected single case study methodology. The case study methodology allows researchers to retain the "holistic and meaningful characteristics of real-life events" from a single case (Yin, 2003, p. 2). This method is used when the researchers feel that contextual conditions are very important to the study. The case study method is an "all-encompassing method that covers the logic of design, data collection techniques and specific approaches to data analysis" (Yin, 2003, p. 14).

The pre-service teachers were randomly assigned to fourteen teaching teams. Thirteen teaching teams had two teachers per group; one group only had one teacher. Each team taught one of two pre-written lessons. The lessons were leadership development lessons; one lesson entitled "Understanding Integrity" and a second lesson entitled "Defining Responsibility." The lessons were were videotaped in the first round of teaching (Round One). Following Round One, the pre-service teachers received verbal and written feedback from their peers and graduate students in the department. Next, each group participated in a reflective experience requiring them to view their team's videotape. The lessons taught were 45-minutes in length, and the video self-reflection process took approximately one hour to complete.

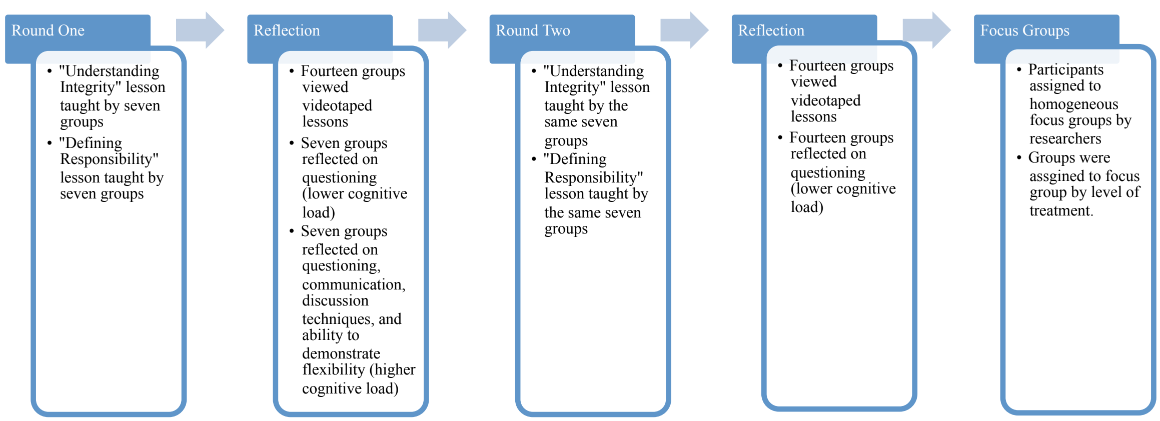
Fourteen teaching teams were randomly assigned to either a control group or an experimental group for the study. Seven groups were assigned to the control group and seven groups assigned to the experimental group. The reflective experience required each teaching team to watch their teaching video from Round One. While watching the video, teams wrote (or typed) each question posed by the teacher(s) during the lesson. Additionally, groups classified each question at the appropriate level of Bloom's Taxonomy (knowledge, comprehension, application, analysis, synthesis, and evaluation). In addition, each group was instructed to indicate if a question did not fall into Bloom's Taxonomy. This included "yes/no" questions or questions deemed "not applicable (N/A)."

Each group was given a packet with directions to complete the reflective experience. The control group's reflective experience was designed to create less cognitive load by asking for reflection on one area, in this case questioning. The experimental group's reflection activity was designed to create higher cognitive load during the reflection process. Their reflection experience also asked for reflection on three additional areas. This included reflecting on their ability to communicate with students, their discussion techniques, and their ability to demonstrate flexibility (Danielson, 2007).

The following week, the teams taught the same lesson again, and again, the lesson was videotaped (Round Two). Following the second round of teaching, the each group completed a second reflective experience. This time, the control and experimental group's reflective experience were identical. Again, each team wrote (or typed) each question posed by the teacher(s) during the second lesson and classified the question in the appropriate level of Bloom's Taxonomy. The groups were also to indicate if a question did not fall into Bloom's Taxonomy (yes/no or N/A).

The focus group interviews were conducted during a regularly scheduled seminar to make it easier for the participants to participate. The researchers conducted four separate focus groups, and each focus group had one facilitator. Homogeneous groups were selected by the researchers to ensure participants within each focus group experienced either the control or treatment. Prior to the focus groups, participants were assured of confidentiality of the discussion and reminded that participation in groups were voluntary. The participants were reminded that there were no right or wrong answers and the purpose of the interview was for participants to describe their experience with the reflection process they had previously participated in. The focus group interviews lasted 30 minutes. All participants in the case study participated in an interview. Figure 1 illustrates the research design.

Figure 1: Research Design Summary



Data analysis for the focus group interviews began during the interviews with probing and follow-up questioning of participants. Probing questions were asked for clarification or elaboration of a response. Data were analyzed using whole text analysis. Whole text analysis is informed by the analytic procedures developed by Glaser and Strauss (1967). The data of each focus group was analyzed independently. Each researcher completed initial thematic analysis to increase the reliability of the analysis. The comparative analysis method was used to code the data. By using comparative analysis, "incidents that are found to be conceptually similar to previously coded incidents are given the same conceptual label and put under the same code" (Corbin & Strauss, 2008, p. 195). Investigator triangulation was used during data analysis to enhance the reliability and trustworthiness of the data (Patton, 2002). Thus, following the initial thematic analysis, researchers discussed minor inconsistencies in coding and then revised the list of themes after finding consensus. Themes from each focus group were combined and organized into subthemes.

The researchers hold different epistemological perspectives. One researcher's epistemology of learning is grounded in social constructivism. She believes that individual learners construct knowledge through information processing, as well as from the influences of surroundings, social interactions, and experiences. She maintains an outsider stance and has limited bias because she does not have a close working or personal relationship with the pre-service teachers. A second researcher believes that individuals actively construct their knowledge by interpreting their experiences and the reality of the world they live in. He believes that the realities are subjective based upon the individual and the context in which the realities were experienced. Often individuals' realities are negotiated socially and constructed based upon their interpretation. He maintains an insider stance and is aware of his biases based on his close personal and working relationships with the pre-service teachers as their instructor and supervisor.

Transferability of the data may be achieved if connections can be drawn between the data from this case study and similar situations. This can be done by other researchers investigating a similar case or by the current researchers as part of future studies. Dependability was maintained by keeping thorough records of data collection and analysis procedures. Credibility was addressed by providing the participants with an opportunity to review the data including themes and subthemes during and after analysis procedures. Confirmability was achieved through the use of rich descriptions and authentic participant quotes, leading the conclusions of the study.

Findings

Based on four focus group interviews, five themes emerged from the analysis of the data, and the categories are used as a framework for organizing the discussion. The themes will be discussed separately. However, they are not experienced independently of one another but rather holistically. The five main themes were: (1) reflection in general, (2) video reflection, (3) reflection on questioning, (4) impact of load, and (5) change in behavior. Table 1 illustrates the five main themes and associated sub-themes. Content related to the identified themes are described next with direct quotations.

Table 1
Common Themes and Associated Sub-themes From Focus Group Interviews

Main Themes	Sub-themes
Reflection in general	Reflection comes naturally, helpful peer feedback, reflection was structured, and reflection through different methods
Video reflection	Fear of watching the videos, videos were helpful, noticed habits, and changes in behavior.
Reflection on questioning	The benefit of reflecting on questions, the frequency of higher-order questions increased after reflection, and watching the video improved questioning skills
Impact of load	The video creating cognitive load, reflection after feedback, challenge of a higher cognitive load, and the impact of a lower cognitive load
Change in behavior	Watching the video caused change and change in questioning techniques

Reflection in General

The participants recognized their ability to naturally reflect after teaching experiences. As a participant said, "…we felt we were reflecting right off the bat while we were giving both of our presentations…." The participants also described the importance of reflection as educators, where one participant explained that as a teacher, he is "going to naturally [reflect] after every lesson." This natural reflection occurs differently for the participants. A participant said he reflects by writing "whatever is in my head." Other participants described how they reflect through conversations with friends or peers. "I feel like there is verbal reflection within the peers, like when we get out of class…we kinda talk about what goes well…," said a participant.

Although participants described this natural ability to reflect on their teaching, they described the structured nature of this reflective experience. "…I thought it was more structured…the reflective process this time," said a female of reflecting using the videos and the packet of information to reflect. She went on to explain that "I've never really done reflection before, and what we've done before this has just been kind of our own thoughts in our journals…." Another participant explained that he felt, "It was very structured, like they told us how to approach it." A female stated that the guide used for this reflection experience "makes it easier, otherwise…I don't even know what to write about, or maybe I don't really have any opinions or feelings about whatever we've been talking about, so if there's a guide then it's easier for me."

The peer feedback the student teachers received after their first video recorded teaching experience proved to be helpful and contribute to reflection. "…we had presented in front of our peers, and then got feedback from it, so then when we later watched the video, you had all those things in your mind…." Another participant described the initial peer feedback as "very beneficial" for helping identify the habits and behaviors that typically go unnoticed. A male explained that "from the feedback too, we learned a lot that we didn't do the first time," after reflecting on both teacher experiences.

Video Reflection

Participants engaged in reflection using video recordings of two teaching experiences. As a result of the reflective experience using videos, many of the participants experienced an initial fearful emotional response to watching the videos because of the "initial fear of what you're gonna see." One participant explained that "I saw myself and it was really hard to sit there and watch myself and my actions throughout the whole video." To reduce the anxiety and fear of watching themselves on video, a participant described a strategy her team used to get through the process, where they "got ourselves comfortable; we went to an environment that was more conducive to video watching… and the second time again, it wasn't as nerve-wracking… just watching yourself again, and we kind of knew what to expect…."

As participants overcame their initial fear of watching themselves teach on video, they expressed the benefits of using videos as part of the reflective process. Video reflection was helpful because "you could actually watch yourself and analyze what you did right, what you did wrong...." Another participant explained the videos provided "a chance to see what you did right…we were like, we need to do that more, that looked great, they got really involved…we were able to see our students…." The videos allowed the pre-service teachers to see what actually happened during their lessons rather than relying on memory alone. As one participant explained "the videos were extremely helpful because, you can sit there and you know, think about things, but until you really see it, you don't know exactly what you did."

Participants used the videos to identify and reflect on nervous habits and characteristics they demonstrated while teaching, many of which they were not aware of until they saw themselves on the video. A participant explained that:

> …you got to see where your ticks were. I know just from seeing the first video and then the second video, I really made sure, ok this time, you know, don't do this nervous habit, don't say 'uhm' five million times, go over here, don't be looking at your paper for questions, and it definitely did, it was very helpful in the long run however painful it might have been.

After the first round of video reflection, participants were aware of their actions and were able to improve for the second teaching experience. "I think after looking at the first video… when I was presenting the second time, I would catch myself maybe starting to do something that I had done on the video that was like, 'oh wait, don't do that'," said a participant. Other changes in teaching behavior made by the pre-service teachers included modifying lesson plans to integrate higher order questions, use of inclusive language, reduced number of questions to increase the level of the questions, and increased wait time.

Reflection on Questions

Through reflecting specifically upon questioning, participants described an awareness of effective questioning techniques. "Reflecting on questioning…will make me more conscious of what I'm asking." Another participant described similar feelings. "Having reflected on the questions it makes you realize how important those questions that you're asking are, and how you can use questions to help you get the messages that you're trying to get across to your students too." The pre-service teachers described the positive results of reflecting specifically on questioning and how the process helped them to ask higher-level thinking questions. "It helped to see if we were asking the surface level questions or if they were higher order thinking questions. So, like in what way were we stimulating student's learning and making them think critically." Furthermore:

> …it was beneficial too that we were supposed to be looking for the questions we ask…it targeted me to look for those questions…and see how many questions that I actually asked and what they were, like what type of questions they were and how they applied to Bloom's Taxonomy.

Participants explained that the use of video was helpful when reflecting upon their questioning techniques. "One thing the video came in really helpful for is when we had to count them, that's when we actually noticed that we weren't doing it consistently." Furthermore, the video allowed the teachers to evaluate their questioning abilities from a more objective standpoint. "…I thought we did awesome at [name of school], and then we looked at the video, I was like, I asked them if they liked ninja turtles, that was one of our questions? And I was just like, why?" Participants also identified changes in their teaching behaviors from reflecting upon questioning. "Instead of just asking knowledge questions, I asked more of the comprehensive, the application…I took it up a notch," and finally, "…we improved our questions by reflecting upon our little mock trial or mock run." One participant expressed similar feelings:

> In the first time, I asked a significant amount of open-ended questions, but after the feedback and after watching the video and taking account of all the questions, I saw where I could improve on questions that weren't just yes or no and weren't rhetorical that really didn't require an answer. I was able to step back, look at my lesson plan, think of some other questions, and I did ask those questions on the second round.

Impact of Load

Participants described how a higher or lower cognitive load influenced their reflection experience. The focus group interviews revealed that cognitive load was present for both the control and experimental groups. The task itself (watching themselves on video) proved to be challenging and uncomfortable for most participants. As one participant explained, "Just watching yourself in general, I think that's nerve-wracking, just seeing yourself up there and being so vulnerable." Another participant expressed similar feelings. "…it was hard for me because I don't like watching myself on video." Even though some indicated a discomfort with the task, many also indicated that watching themselves on video was beneficial. "Oh I enjoyed it just so I could see what I was doing wrong, like I flick my hair a lot and people didn't tell me that."

The pre-service teachers expressed that receiving verbal feedback before reflecting on their teaching helped facilitate their reflection process:

> It was different too because we had presented in front of our peers, and then got feedback from it, so then when we watched the video, you had all those things in your mind to keep in mind too, which kinda helped you to focus more on different aspects of the presentation, and you could really focus on more. Whereas I think if I had watched the

> video before I had, you know, had that session with the peers, I probably wouldn't of picked up on near as much.

Another participant expressed similar feelings. "I think getting the feedback…we had that in mind when we were watching the videos so we were looking for all of that…we knew what we had to do." Even so, participants described the confusion felt between the first and second reflective experiences. "I was sitting there kind of wondering like, well, do they want the same thing that I said in stand and deliver or are we supposed to say something different…."

The challenges of reflecting on multiple areas (higher cognitive load) also emerged from the data. The participants described that when placed under a higher cognitive load, the reflection process "…probably wasn't as in depth as it potentially could have been." As one participant explained, "I feel like we were focused on trying to get answers for all the different parts rather than really focusing…thinking critically about this one part or these few things that I really, really need to improve on." Participants did find value in examining teaching from multiple perspectives, but indicated the process was perhaps too critical. "It felt like, I realize it's good to be critical, but it almost was fishing for things that went wrong, and not necessarily in every case there were three things that needed to be improved on." Additionally, the pre-service teachers found it difficult to reflect on multiple areas by watching their video only once because "…let's be honest, to catch it all you're probably going to need to watch it four times." Some even felt that being asked to reflect on multiple areas was repetitive. "It felt very redundant," expressed one participant "…there was a lot of overlap between the different areas that we were trying to improve."

On the other hand, participants that were placed under a lower cognitive load during the reflection process felt that being asked to reflect upon only one area "…guided us towards a specific area…." Furthermore, lower cognitive load participants indentified some foreseen challenges of being asked to reflect upon multiple areas:

> …[focusing on one area] made us focus in on that one area that they asked us to, whether it be how many teacher questions did you ask, how many student questions were there? We might have missed something else [if focusing on more areas]…we might have missed another part of instruction that we should have picked up on.

Even though the control group was asked to reflect upon only one area, participants found themselves naturally reflecting on other areas. "As far as reflection, it wasn't just questions, we watched our first thing and we couldn't believe how incredibly boring we were, so we had to, you know, change some stuff."

Change in Behavior

Participants described the challenges and benefits that arose from participating in these reflective experiences. Nevertheless, participants indicated that experiences created a change in teaching behaviors. The use of video in the reflective experience helped the pre-service teachers to implement changes to their lesson plans and their teaching in general:

> …when we watched our first video, we would review it, and we would catch ourselves saying those things. So when we taught it again, we would try not to say those things. When we watched the second video, we picked up that we didn't say them as many times.

Another participant described similar results. "When I watched the first video, I saw I shouldn't have stood there, I should have gone over and helped these students, so I actually did it the second time." Furthermore, "…after watching the video, I saw where I could improve…I was able to step back, look at my lesson plan, think of some other questions, and I did ask those on the second round."

This reflective experience also helped the pre-service teachers to change their questioning techniques. "It made you more aware of the questions you were asking. I was trying to actually use Bloom's Taxonomy." Another participant added that reflecting on questions made them "think about what level the question is or where it falls in Bloom's Taxonomy. I never really thought about that the first time we went through." When asked to specifically describe how the reflective experience impacted their teaching, participants described specific differences between the teaching rounds. "…we tried to change our questions to make them higher level thinking questions." Additional participants indicated changes by "adding more follow-up questions, why and how," and "…we had less questions and more wait-time." One participant described how planning will be approached differently as a result of this experience:

> And I think it's okay if you think about it ahead of time and write down all the questions, just have it in your [lesson plan]. If not, I'm not going to remember the question, and then I find myself asking questions that don't fall into Bloom's whatsoever, and there just not very valid questions that get students to think at a higher level.

Conclusions/Recommendations

The objective of this study was to describe if an increase in cognitive load impacts the reflection experience of pre-service teachers. The researcher made the following conclusions based on the data collected. The conclusions of this study are not generalizable beyond the population in this particular case study. The findings indicate that reflection is a valuable experience for pre-service teachers. In many cases, pre-service teacher's reflection is innate and a natural ability of which they are aware. Through the reflection process, pre-service teachers are able to modify or adjust their teaching behavior based upon a reflective experience. Additionally, the use of video technology is a useful medium for helping pre-service teachers reflect. While some may not be comfortable with its use, it is helpful when asking pre-service teachers to reflect upon their teaching. Video technology also allows pre-service to make instructional decisions based on current data versus being asked to recall the teaching experience from their memory. Furthermore, asking pre-service teachers to reflect on their questioning helps improve their ability to ask higher level thinking questions and move students through Bloom's Taxonomy. It provides a realistic method for putting Bloom's Taxonomy to use in the classroom. The pre-service teachers in this study acknowledged their change in behavior as a result of their participation in this reflective experience. It can be concluded that reflection in general, video reflection, and reflection on questioning all contribute to changes and improvement in teaching behaviors for pre-service teachers.

The data provides information about the role cognitive load has on the reflection process. It should be noted that the participants were naturally looking for and focusing on more than one area during the reflection process. While the control group's reflection process was designed to create a lower cognitive load, participants were analyzing their teaching from many different viewpoints (ease in front of the classroom, classroom management, instructional decisions, etc). Even so, it was determined that a higher cognitive load did impact the depth of reflection of pre-service teachers. When asked to reflect on multiple areas, higher cognitive load impacted the depth of reflection and the application of critical thinking skills that reflective experiences are designed to create. However, though being asked to reflect upon multiple areas was difficult, the pre-service teachers in this study were able to consciously adjust their teaching and improve their lesson after the initial teaching round. Finally, cognitive load plays a role in all reflective experiences because many task factors come into play. The environment, video recording, initial peer teaching, receiving a grade, lack of preparation, etc. are examples of task factors that play a role in the amount of load placed on pre-service teachers during reflective experiences.

Based upon the findings of this study, the researchers recommend the following:

- Teacher preparation programs should continue to provide pre-service teachers with reflective experiences throughout their program. Additionally, the use of video technology should be incorporated when asking pre-service teachers to reflect upon their teaching experiences.
- Pre-service teachers need opportunities to analyze their questioning skills according to Bloom's Taxonomy. If the appropriate skills are not present, additional training should be provided.
- Reflective experiences for pre-service teachers should take into consideration cognitive load and must have a clear purpose and objective. If not, pre-service teachers may experience higher cognitive load decreasing the effectiveness of the reflective experience.
- Reflective experiences of pre-service teachers should not be overwhelming and need to be designed to decrease the cognitive load. Pre-service teachers should be not asked to reflect upon multiple constructs of teaching at one particular time.
- A follow-up study should investigate the impact cognitive load has on the transfer of specific teaching skills from reflective experiences. The study should examine the number of constructs to be included in reflective experiences in order to optimize transfer of skills. Data collection for the follow-up study should include document analysis of all materials used during reflective experiences.
- Future studies should be designed to investigate the impact reflective experiences have on other teaching constructs (i.e. classroom management, lesson planning, and other teaching behaviors) to determine if reflection on those areas results in change of teaching behaviors.

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Impact of Gender, Ethnicity, Year in School, Social Economic Status, and State Standardized Assessment Scores on Student Content Knowledge Achievement When Using Vee Maps as a Formative Assessment Tool

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Abstract

The National Research Council has recognized the challenge of assessing laboratory investigation and called for the investigation of assessments that are proven through sound research-based studies. The Vee map provides a framework that allows the learners to conceptualize their previous knowledge as they develop success in meaningful learning when they utilize the Vee map to guide their thinking and the process of experimentation. Previous research has shown that using the Vee map as a formative assessment tool positively affects student content knowledge. The purpose of this study was to compare the impact of student demographic variables on student content knowledge achievement when using the Vee map as a formative assessment tool. The population of this quasi-experimental, counter-balance design study was composed of students at nine high schools that offered agriscience education. The results of this study indicated the Vee map is unbiased based on gender, grade, and ethnicity. It was also concluded that the Vee map does not provide either remedial or non remedial readers with a significant advantage, thus allowing the assessment to focus on the content rather than a student's reading ability.

Introduction

The secondary level of the United States educational system has adopted higher graduation requirements in the areas of English, math and science. As a result, many states experienced a shift of focus toward the core content areas and experienced an increase in overall assessment scores through the 1990s (USDE, 2009). Progression of student driven achievement during the 1990s led to the establishment of academic standards and goals, and the National Center for Education Statistics (NCES) reported stable performance in the science and math subjects and modest gains in reading (USDE, 2000). This focus prompted agricultural education to conduct several studies to demonstrate the science connections in agricultural education and the teachers' willingness to provide agricultural education as an integrated science in the secondary educational curricula (Balschweid, 2002; Balschweid & Thompson, 1999; Balschweid & Thompson, 2002; Connors & Elliot, 1994; Dyer & Osborne, 1999; Johnson & Newman, 1993; Layfield, Minor, & Waldvogel, 2001; Myers, Thoron, & Thompson, 2009; Myers & Washburn, 2008; Newman & Johnson, 1993; Peasley & Henderson, 1992; Thompson, 1998; Thompson & Balschweid, 1999; Warnick & Thompson, 2007; Washburn & Myers, 2008; Welton, Harbstreit, & Borchers, 1994).

However, in the early twenty–first century, No Child Left Behind (NCLB) legislation has remained a driving factor in measuring student achievement (USDE, 2009). In 2000, eighty–two percent of the nation's twelfth graders performed below the proficient level on the National Assessment of Education Progress (NAEP) science assessment. The document stated, "the longer students stay in the current system the worse they do. According to the 1995 Third International Mathematics and Science Study, U.S. fourth graders ranked second. By twelfth grade, they fell to 16th…" (USDE).

Stagnant and lowering scores in science achievement have caused concern throughout the nation. The USDE (2009, paragraph 13) stated, "researchers have scientifically proven the best ways to teach reading. We must do the same in science. America's teachers must use only research–based teaching methods and the schools must reject unproven fads." Educational researchers have responded to the call by NCLB and the USDE. There have been numerous efforts to improve teaching and learning in the secondary setting (Atkin & Coffey, 2003; Gengarelly & Abrams, 2009). Continued efforts to provide research–based evidence have produced research in the areas of teaching and learning with experimental designs based on standardized testing (Anderson, 2002).

One specific way, identified by the National Research Council (NRC), to increase student performance and scientific knowledge is by shifting a greater focus to hands–on (laboratory) instruction in the science curriculum (NRC, 1996; NRC, 2000). Laboratory investigation is widely accepted as good educational practice (Baker, Thoron, Myers, & Cody, 2008; Baxter, Shavelson, Goldman, & Pine, 1992; Eshe, 2006; Ornstein, 2006; Roth, 1990; Shavelson, Baxter, & Pine, 1991) and teaching agriculture in a laboratory setting has been an integral part of agricultural education for many years (McBryde, 1901; Nolan, 1911; Winslow, 1891). Osborne's (1994) publication built upon this foundation and placed a greater emphasis on teaching using experiments in the agriscience context. Diederen, Gruppen, Hartog, and Voragen (2006) noted that one of the benefits of laboratory instruction is its use as a means to increase a student's understanding and ability to apply knowledge.

While hands-on laboratory experience has been accepted as good teaching, finding assessments that are meaningful to the learner and user-friendly to the teacher remains a challenge (Thoron & Myers, 2009). The National Research Council recognized the challenge of assessing laboratory investigation and called for the investigation of assessments that are proven through sound research-based studies (NRC, 1996). Driver (1995) stated that interventions and expectations set by the teachers promote understanding and those expectations are communicated through assessment techniques.

Thoron and Myers (2009) stated that laboratory reports are commonplace during laboratory experiments. However, once students create a laboratory report teachers have the time-consuming task of grading and commenting on the lengthy reports (Thoron, Swindle, & Myers, 2008). Thoron and Myers also reported that teachers are challenged with the amount of time spent grading laboratory reports and that may lead to fewer experiments being conducted or no assessment of student learning during laboratories. Laboratory reports remain useful, but teachers are essentially assessing the students' abilities to follow directions, collect data, and provide the correct answers to conclusion questions (Novak & Gowin, 1984) and fail to develop deep understanding because students are immersed in the steps and writing required to complete the laboratory report and turn the report in to receive a grade (Lebowitz, 1998). Furthermore, Novak, Gowin, and Johansen (1983) stated that a deepened epistemological structure can be created by students engaged in quality laboratories with proper assessments. Therefore, examination of empirical evidence supportive of an alternative to the laboratory report is the focus of this study.

Baxter, Shavelson, Goldman, and Pine (1992) stated that dissatisfaction of current assessments, advances in research on cognition and instruction, and reforms in science curricula continue to lead alternative assessment measures for experiments. Shavelson, Baxter, and Pine (1991) stated that continued focus on constructivism lends itself to finding alternative meaningful assessments. The authors stated that educational research should focus on educational measures that go beyond correct responses to reports and focus on conceptual understanding, problem-solving, and application.

Gowin's (1979) Vee map is an assessment tool that can aid in the development of deeper student understanding and a time-friendly formative assessment for teachers to utilize during laboratory investigations (Roehrig, Luft, & Edwards, 2001; Thoron & Myers, 2009). The Vee map is a scaffolding tool that applies Kolb's (1984) model of experiential learning and allows for student manipulation of experiments (Thoron & Myers, 2009). The Vee map does not just require knowledge recall of an experiment, but requires students to formulate a question of investigation, identify key terms, include steps of investigations, create graphic organizers, incorporate data tables, and draw conclusions upon the student guided investigation (See Figure 1). The Vee map may be used in place of a traditional laboratory report (Roehrig, Luft, & Edwards) when appropriate (Thoron & Myers, 2007) at the formative and summative levels (Thoron & Myers, 2009).

Secondary laboratories in the agriscience classroom are in need of modernizing assessment techniques that are suited for investigation and shift the focus away from only assessing if the student followed the correct procedure (Millar, 2004). Edwards, Luft, Potter, and Roehrig (1999) found that students learned more when they designed and carried out their own investigation. Emphasis can be shifted away from conducting experiments simply to try to develop the "correct" answer by: a) focusing on student-applied scientific concepts, b) explaining the methods of the experiment, and c) drawing clear conclusions from authentic results that are easily graded and provide feedback to the learners more quickly (NRC, 2006). A Vee map can offer solutions for this type of constructivist learning.

Thoron and Myers (2009) conducted a study that compared the Vee map and the laboratory report. In their study conducted with Florida introduction to agriscience students (n = 268) it was reported that there was a significant difference in student content knowledge achievement scores between groups. Students receiving the Vee map out performed their counterparts each time during the experimental counter-balance design. Thus, Thoron and Myers found the Vee map to have a positive impact on student content knowledge; however, further examination of additional variables could lead to better understanding how the Vee map impacts students based on gender, ethnicity, state standardized tests, grade, and social economic status.

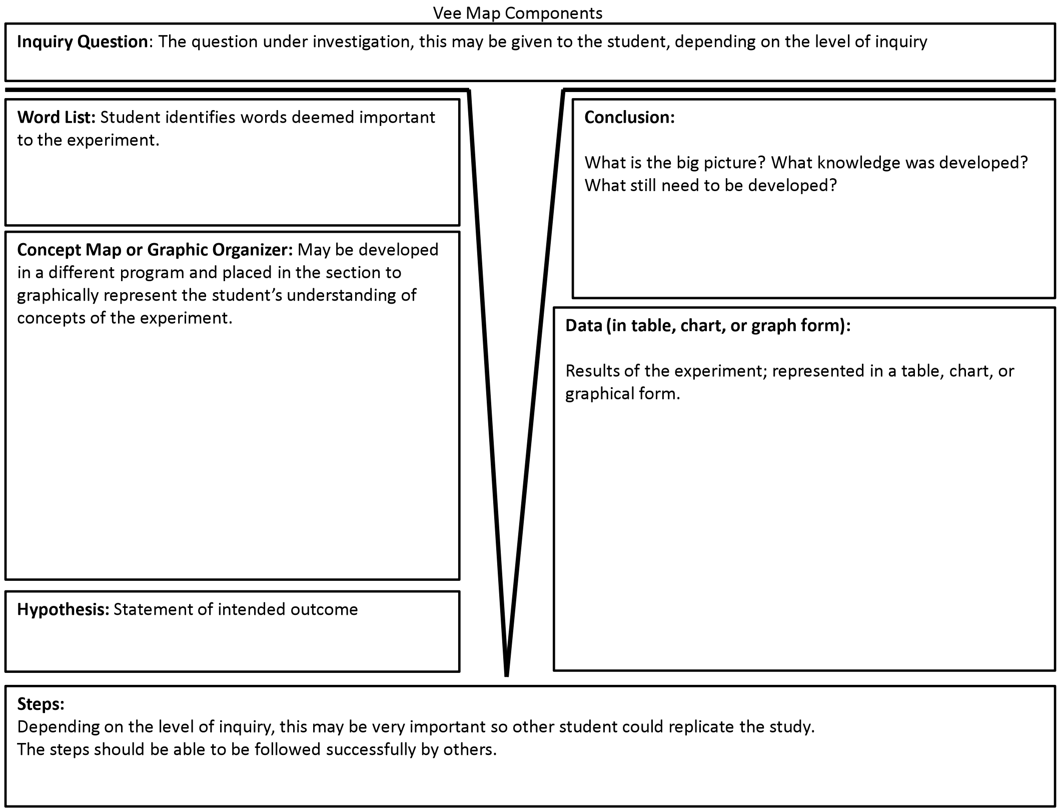

Figure 1. Vee Map Components.

Theoretical Framework

Ausubel's (1963) learning theory acted as a guide for this study. Ausubel places a central emphasis on learners' prior knowledge and the influence created on meaningful learning. "Meaningful learning results when a person consciously and explicitly ties new knowledge to relevant concepts or proposition they already possess" (Novak, Gowin, & Johansen, 1983, p. 625). Ausubel stated there is interplay between affective learning and cognitive learning and he built his theory for the meaning of each concept. Ausubel identified seven concepts along a continuum. Each concept builds on the previous that takes the learner from incorporation of information verbatim, to building knowledge and linking the relevant concepts together. As a result, learning becomes "less rote" and "more meaningful" through the planned instructional practice that supports learners. Novak (1980) stated that in order for learners to be successful in this theory the material must be inherently meaningful, the learner must link new knowledge with existing and relevant knowledge, and the learner must know relevant concepts involved in the scientific investigation. The Vee map provides the frame work that allows the learners to form the basis of Ausubel's learning theory as they develop success in meaningful learning when they develop the Vee map as a diagram of their thinking and process of experimentation. The Vee map provides a structure for students to exhibit their scientific foundation, investigate without following a laboratory verbatim, and have the ability to incorporate their previous knowledge.

America's Lab Report (NRC, 2006) outlined goals for laboratory experiences in educational settings. These goals served as the framework of the study. Goal one is to enhance mastery of subject matter. The study's objective was to compare the impact on content knowledge achievement of two different formative assessments in laboratory instruction. Developing scientific reasoning is another goal in the report. The Vee map is a tool specially designed to develop the scientific thinking skills of the learners (Gowin, 1979). Goal three is for students to exhibit connections between laboratory experiences and empirical work. The Vee map quantifies student experience through the use of graphic organizers and guides students to draw upon empirical data to form conclusions and recommendations. Finally, employing team work through laboratory investigations and asking student opinions of their utilization of the formative assessment tools bring all the goals outlined in the NRC report into this study.

Purpose and Objectives

The purpose of this study was to compare the impact of student demographic variables on student content knowledge achievement when using the Vee map as a formative assessment tool. The specific objectives guiding the study were to:

1. Determine the impact of gender on student content knowledge achievement when using a Vee map.
2. Determine the impact of ethnicity on student content knowledge achievement when using a Vee map.
3. Determine the impact of grade level on student content knowledge achievement when using a Vee map.
4. Determine the impact of social economic status on student content knowledge achievement when using a Vee map.
5. Determine the impact of a state standardized test on student content knowledge achievement when using a Vee map.

The null hypothesis, H_o: There is no significant difference in student content knowledge achievement based on gender, ethnicity, grade level, social economic status, and state standardized test when using the Vee map as a formative assessment tool.

Procedures

This study is part of a larger study conducted by Thoron and Myers (2009). Thoron and Myers reported the population of this quasi-experimental, counter-balance design study was composed of students at nine Florida high schools that offered agriscience education ($N = 291$). Each participating high school agriscience program was required to have two sections of introduction to agriscience. Schools were then purposively selected by a panel of experts on the capacity to integrate science into the curriculum. The Vee map is referred to as the treatment and the comparison (control) was determined to be the laboratory report. The order in which the intact groups received the treatment and comparison was determined randomly. Ary, Jacobs, and Sorensen (2010) stated that a counter-balance design is appropriate for use with intact groups. A counter-balanced design provides the ability to rotate out any differences that might exist between groups (Ary, Jacobs, & Sorensen, 2010).

Each student was administered a pretest to establish a base line before each replication to measure content knowledge in the subject matter being taught (soil science) and served as a covariate measure. All sections were taught the same subject matter content by the same teacher and taught using the same teaching techniques and methods. Control section participants completed the laboratory report outlined by Osborne (1994) in his text *Biological Applications in Agricultural Education* following the completion of a laboratory activity. Participants in the treatment group completed the Vee map. Following the data analysis procedure for counter balanced design suggested by Ary, Jacobs, and Sorensen (2010), column means were calculated for each treatment. Those means were then compared using a univariate analysis of covariance.

Pretest and posttest instruments were developed by the researchers using content knowledge questions in the form of thirty multiple choice items. The instruments contained a specific number of questions based upon the determined percentage of time to be spent teaching each objective of the unit. The testing instruments were validated by a panel of agriscience education experts from a state land grant university and were determined to be valid. The posttest questions were asked in a randomly selected order to reduce testing effect (Campbell & Stanley, 1963). Test–retest reliability was determined with a summated test score mean of 74.4 percent for test one and 63.6 percent for test two. Reliability coefficients for the knowledge level assessments were .99 and .99 respectively.

To help control for teacher variance, each school had a counter balance design and each teacher participated in a tutorial which explained teaching techniques, format and structure of the laboratory and Vee map reports. Upon completion of the tutorial, teachers received continuing professional development credit. Each teacher taught the selected lessons for four weeks. Researchers determined *a priori* that the intervention was not fully administered if a student missed 25% or more of instruction in the unit. Therefore, students missing more than four days of school during the study period were removed from the data set.

Twenty–nine students were removed from the study due to missing 25% or more of the instructional unit. Thus the original sample was narrowed to $n = 268$. All replications contained two lessons and before the lessons were taught a pretest was given to serve as a covariate to adjust for achievement prior to the treatment. Analysis for each objective utilized a covariate technique to analyze the data. Following the completion of data collection, posttest score means for each treatment, regardless of replication, were calculated (Ary, Jacobs, & Sorensen, 2010).

Findings

The first objective sought to determine the impact of gender on student content knowledge achievement when using a Vee map. The analysis of the data for this objective was guided by the null hypothesis that there is no significant difference in student content knowledge achievement based on gender. Following the first replication, males reported a posttest score of 69.03 (SD=16.65) on posttest 1 and females reported a posttest score of 64.43 (SD=17.99) on posttest 1 (See Table 1). This difference in posttest scores was found to not be statistically significant, $F(234.44) = 2.91$, $p = .09$. Following the second replication, males reported a posttest score of 63.42 (SD=17.99) on posttest 2 and females reported a posttest score of 67.91 (SD=16.59) on posttest 2. This difference in posttest scores was also found to not be statistically significant, *F*(234.25) = 3.49, *p* = .06. No statistically significant differences were found in the replications, thus the null hypothesis failed to be rejected.

Table 1
Posttest scores of Vee map by gender (n = 268).

	Mean Test Score					
	Posttest 1			Posttest 2		
Gender	*M*	*SD*	*n*	*M*	*SD*	*n*
Male	63.43	17.99	157	69.03	16.65	157
Female	67.91	16.59	111	64.43	17.99	111

The second objective sought to determine the impact of ethnicity on student content knowledge achievement when using a Vee map. The analysis of the data for this objective was guided by the null hypothesis that there is no significant difference in student content knowledge achievement based on ethnicity. Following the first replication on posttest 1, black students reported a posttest score of 63.27 (SD=14.91), Hispanic students reported a posttest score of 65.88 (SD=18.35), white student reported a posttest score of 65.18 (SD=17.81), and students that self-identified as other scored 82.25 (SD=14.15) (See Table 2). This difference in posttest scores was found not to be statistically significant, *F*(189.22) = 1.069, *p* = .36. Following the second replication and completion of posttest 2, black students reported a posttest score of 67.84 (SD=16.99) on posttest 2, Hispanic students reported a posttest score of 65.05 (SD=15.44), white students reported a posttest score of 67.38 (SD=17.85), and students that were self-identified as other scored 71.25 (SD=20.14). This difference in posttest scores were found not to be statistically significant, *F*(180.84) = 0.58, *p* = .63. No statistically significant differences were found in the replications, thus the null hypothesis failed to be rejected.

Table 2
Posttest scores of Vee map by ethnicity (n = 268).

	Mean Test Score					
	Posttest 1			Posttest 2		
Ethnicity	*M*	*SD*	*n*	*M*	*SD*	*n*
Black	63.27	14.91	37	67.84	16.99	37
Hispanic	65.88	18.35	43	65.05	15.44	43
White	65.18	17.81	184	67.38	17.85	184
Other	82.25	14.15	4	71.25	20.14	4

The third objective sought to determine the impact of grade level (year in school) on student content knowledge achievement when using a Vee map. The analysis of the data for this objective was guided by the null hypothesis that there is no significant difference in student content knowledge achievement based on grade level. Following the first replication and submission of posttest 1, ninth grade students reported a posttest score of 65.91 (SD=17.19), tenth grade students reported a posttest score of 62.67 (SD=18.82), eleventh grade students reported a posttest score of 63.77 (SD=17.52), and twelfth grade students scored 73.64 (SD=14.10) (See Table 3). This difference in posttest scores was found not to be statistically significant, *F*(229.17) = 1.28, *p* = .28. Following the second replication and completion of posttest 2, ninth graders reported a posttest score of 65.72 (SD=18.17), tenth grade students reported a posttest score of 70.09 (SD=14.99), eleventh grade students reported a posttest score of 69.46 (SD=17.91), and twelfth grade students scored 65.09 (SD=12.79). This difference in posttest scores were found not to be statistically significant, $F(217.34) = 1.75$, $p = .16$. No statistically significant differences were found in the replications, thus the null hypothesis failed to be rejected.

Table 3
Posttest scores of Vee map by grade (n = 268).

	Mean Test Score					
	Posttest 1			Posttest 2		
Grade level	*M*	*SD*	*n*	*M*	*SD*	*n*
9th	65.97	17.19	164	65.72	18.17	164
10th	62.67	18.82	58	70.09	14.99	58
11th	63.77	17.52	35	69.46	17.92	35
12th	73.64	14.01	11	65.09	12.79	11

The fourth objective sought to determine the impact of social economic status (SES), through the use of the school lunch program guidelines, on student content knowledge achievement when using a Vee map. The free and reduced school lunch program (FRSLP) was used as a proxy to SES based on the work of Stone and Lane (2003) and Merola (2005) that described linkage between SES and ability to participate in a state's FRSLP on student performance. The analysis of the data for this objective was guided by the null hypothesis that there is no significant difference in student content knowledge achievement based on SES. Following the first replication and submission of posttest 1, students not eligible to participate in the school lunch (reduced or free) program reported a posttest score of 65.32 (SD=17.61), students eligible to participate in the reduced school lunch program reported a posttest score of 73.20 (SD=13.18), students eligible to participate in the free lunch program reported a posttest score of 60.67 (SD=18.12) (See Table 4). This difference in posttest scores was found to be statistically significant, $F(253.83) = 5.434$, $p = .01$. Following the second replication and completion of posttest 2, students not eligible to participate in the lunch program reported a posttest score of 68.87 (SD=17.72), students eligible for a reduced lunch reported a posttest score of 69.73 (SD=14.17), and students eligible for a free lunch reported a posttest score of 61.70 (SD=17.15). This difference in posttest scores were found to be statistically significant, $F(239.96) = 3.29$, $p = .04$. Statistically significant differences were found in the replications; thus the null hypothesis was rejected.

Table 4
Posttest scores of Vee map by SES (n = 268).

Ability to participate in the lunch program	Mean Test Score					
	Posttest 1			Posttest 2		
	M	*SD*	*n*	*M*	*SD*	*n*
Not able to participate	65.32	17.60	158	68.87	17.72	158
Reduced lunch	73.20	13.18	40	69.73	14.17	40
Free lunch	60.67	18.12	70	61.70	17.15	70

The fifth objective sought to determine the impact of state standardized tests through the use of standardized assessment scores for reading, math, and science on student content knowledge achievement when using a Vee map. The analysis of the data for this objective was guided by the null hypothesis that there is no significant difference in student content knowledge achievement based on a state standardized test. Following the first replication and submission of posttest 1, students considered remedial readers reported a posttest score of 65.08 (SD=17.25), students not considered remedial readers reported a posttest score of 74.36 (SD=14.08), students in the same categories for posttest 2 scored 53.66 (SD=14.45) and 61.57 (SD=15.94) respectively (See Table 5). This difference in posttest scores was found to be statistically significant in both cases. Posttest 1 reported, $F(246.60) = 12.314$, $p = .00$, posttest 2 reported, $F(129.81) = 9.637$, $p = .00$ respectively (See Table 5). Statistically significant differences were found in the replications, thus the null hypothesis was rejected.

The state science score comparison of posttest 1 students remedial in science reported a posttest score of 67.54 (SD=16.74), students not remedial in science reported a posttest score of 75.03 (SD=13.78). This difference in posttest scores were found to be statistically significant, $F(171.01) = 3.72$, $p = .01$. The second replication and submission of posttest 2, students remedial in science reported a posttest score of 54.76 (SD=14.93), students not remedial in science reported a posttest score of 63.89 (SD=13.64). This difference in posttest scores were found to be statistically significant, $F(126.74) = 8.20$, $p \leq .00$. Statistically significant differences were found in the replications, thus the null hypothesis was rejected (See Table 5).

The state math score comparison of posttest 1 students remedial in math reported a posttest score of 68.00 (SD=18.78), students not remedial in math reported a posttest score of 71.71 (SD=13.09). This difference in posttest was not found to be statically significant, $F(234.29) = 3.39$, $p = .01$. The second replication and students' completion of posttest 2, students remedial in math reported a posttest score of 53.34 (SD=14.32), student not remedial in math reported a posttest score of 61.11 (SD=15.15). The difference in posttest was found to be statically significant $F(111.24) = 6.62$, $p \leq .00$. Statistically significant differences were found in one replication, thus the null hypothesis was rejected (See Table 5).

Table 5
Posttest scores of Vee map by SES (n = 268).

State Standardized test	Mean Test Score – Remedial						Mean Test Score – non remedial					
	Posttest 1			Posttest 2			Posttest 1			Posttest 2		
	M	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*
Reading	65.08	17.25	101	53.66	14.45	101	71.36	14.08	167	61.57	15.94	167
Science	67.54	16.74	173	54.76	14.93	173	75.03	13.78	95	63.89	13.64	95
Math	68.00	18.78	89	53.34	14.32	89	71.71	13.09	179	61.11	15.15	179

Conclusions and Recommendations

The Thoron and Myers (2009) study indicated that the Vee map, as a formative assessment tool, was more effective in the agriscience classroom when compared to the laboratory report. The Vee map is an interactive teaching/evaluation tool to be considered for classroom use. This study's results indicated the Vee map is not affected by gender, ethnicity, or grade level. However, this study does report a statistically significant difference in SES status. Further examination of the SES status revealed students receiving reduced lunch scored better during both replications. Students receiving free lunch scored the lowest each replication. The researchers suggest further examination of qualities reduced lunch students' posses in order to score significantly higher than their peers. Further investigation and consideration of the theoretical model guiding this study suggest emphasis on learners' prior knowledge and the influence created during meaningful learning (Ausubel, 1963). As Novak (1980) stated, in order for learners to be successful through the Ausubel theory the material must be inherently meaningful. Therefore, further investigation seeking knowledge if agriscience education and laboratories are more meaningful to students that qualify for reduced lunch status. Also, are students at lower socioeconomic status levels (eligible for reduced lunch program) bringing in more practical knowledge and able to apply it with a Vee map and the agriscience classroom? Further investigation may provide a link for student motivation in the classroom for students in this demographic.

Significant differences were found in reading and science when comparing remedial and non remedial learners. It can be concluded that the Vee map does not provide either remedial or non remedial learners with a significant advantage. Therefore, the Vee map may not aid in closing the gap that exists between the two groups. More importantly however, is the Vee map does not provide a disadvantage to students struggling to read. An assessment tool that assesses student knowledge construction of scientific principles an empirical data is the goal of the Vee map. A tool that assesses scientific measures and not reading ability is increasingly important. Furthermore, the examination of math scores reported mixed results and further investigation should be conducted.

Finally, this study does not provide evidence that the formative assessment tool provides an advantage over one group or another when based on grade, gender, or ethnicity. The United States Department of Education called for assessments that are research based and provide for measures that do not place an advantage on specific demographic groups (Anderson, 2002). The Vee map may be a way to motivate females and minorities to become enthused about science and science experiments. Further investigation of student attitudes toward the use of Vee maps should be investigated.

Although this study has limitations based on a purposive selected sample, Vee maps should be considered a meaningful tool in the agriscience profession. Inservice and preservice teachers and teacher educators should examine this tool and consider it an effective way to assess experiments in the agriscience classroom. Baxter, Shavelson, Goldman, and Pine (1992) stated there is a dissatisfaction of current assessments, leading to a further developed need to reform curriculum and advance student thinking and understanding. This tool provides for better thinking when measuring student content knowledge achievement (Thoron & Myers 2009) and this study indicated it is unbiased based on gender, grade, and ethnicity. Shavelson, Baxter, and Pine (1991) stated that the educational research should focus on educational measures that go beyond correct responses to reports and focus on conceptual understanding, problem-solving, and application, the Vee map provides the profession with that avenue.

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Feasibility of Using the Modified Matrix as a Method for Developing Workshop Content

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Abstract

The purpose of this study is to determine the feasibility of using the Modified Matrix as a means for identifying topic areas and critical needs for an educational workshop. Currently, there are little data available identifying methods for identifying critical needs vs. low level needs for workshop development or training programs within the agricultural sector. A Delphi study was conducted to determine content for a workshop on food safety at the pre-harvest level. Researchers utilized industry experts as a means for identifying topic areas for the workshop. Results indicated each area of need (constructs) for the topic areas and ultimately, their level of importance. Based on the performance of participants on a pre-test given at the beginning of the workshop combined with the level of importance of the topic areas, each topic area was labeled as a critical need, low-level need, low-level successful program, or a successful program. Each topic area was graphed using the Modified Matrix, utilizing the scores received for level of importance and student knowledge level from the pretest. Thus, researchers were able to identify critical needs and notify workshop presenters of areas that should be emphasized during the training sessions.

Introduction and Conceptual Framework

Needs assessments have long been an integral ingredient in success of agricultural education and extension education programs. Witkin (1984) cites Kaufman's (1982) article that defines needs assessment as: "…a formal analysis that shows and documents the gaps between current results and desired results (ideally concerned with gaps in OUTCOMES), arranges the gaps (NEEDS) in priority order, selects the NEEDS to be resolved" (p. 14). Witkin and Altschuld (1995) define a Needs Assessment as "a systematic set of procedures undertaken for the purpose of setting priorities and making decisions about program or organizational improvement and allocation of resources. The priorities are based on identified needs." (p.4). A *need* is generally considered to be a discrepancy or gap between "what is," in reference a group or organization and "what should be," or what is desired of the group. A needs assessment seeks to determine the discrepancies, examine the causes of the discrepancies, and then set priorities for what the future action should be when dealing with the gaps within the program (Witkin and Altschuld, 1995). According to Witkin (1984), there is no substitute for a systematic and organized method of assessing needs in order to make decisions about priorities for programs. Witkin also states that quantitative methods must be combined with qualitative methods in order to give a proper balance to the study.

Researchers took the characteristics of a needs assessment into consideration and opted to utilize the Delphi Method as a means for gathering data in a manner that was both quantitative along with traces of qualitative. The qualitative portion of the study takes place in the needs assessment conducted by researchers. Researchers conducted a needs assessment in an effort to determine needs for an educational workshop directed to feedlot management. The workshop was an integral part of validating the usage of a modified matrix analysis as a needs assessment tool.

The American Association for Agricultural Education National Research Agenda (2007) identified a research priority within the contextual area of Agricultural Education in Domestic and International Settings: Extension and Outreach as; Identify the needs and competencies of stakeholders and professional practitioners in nonformal agricultural extension education. Figure 1 shows the Model for Workshop Evaluation presented by Russell, Brashears, Brashears, Loneragan, and Miller (2009) as a means for developing and evaluating workshops. The researcher conducting the evaluation begins with by observing and measuring presage variables. These variables are those that are taken into account when a participant enrolls in a workshop. These variables play a role in determining the readiness, motivation, and existing schema of the participants. Additionally, participant attitudes entering the workshop may impact their satisfaction of the workshop. As indicated below, the needs assessment portion is conducted only after considering these presage variables. In order for the workshop to be effective in conveying the interests and needs of the participants, the needs assessment must occur prior to determining delivery format, environment, and presenter effectiveness.

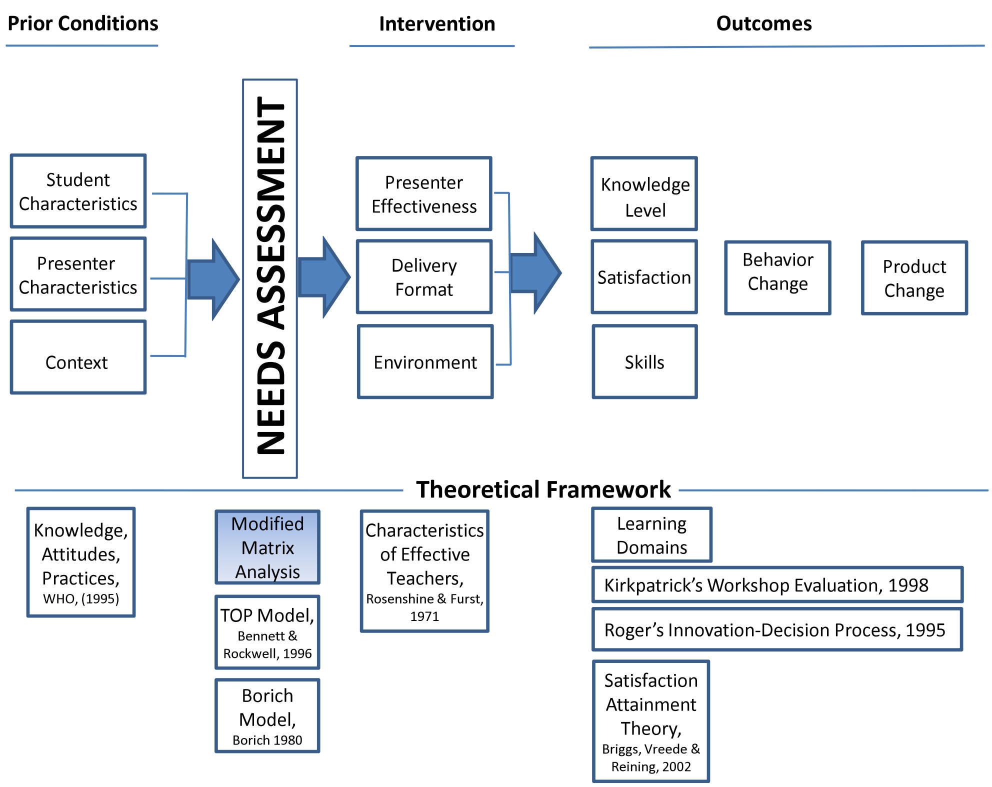

Figure 1. *Model for Workshop Evaluation*

In addition to the model developed by Russell, et.al (2009), Kirkpatrick (2007) recommends some practical approaches to developing an effective training program. One of these recommendations is to ask managers of the participants what knowledge and/or skills they believe their subordinates need. For the purposes of validating the Modified Matrix, researchers used industry and academia experts in this role. According to Kirkpatrick (2007), this will not only provide crucial information to consider in planning the curriculum for a workshop, but it should also help to create a relationship with the experts in regards to their acceptance and support of the program or workshop. Needs assessments in agricultural education and extension education have a long history of making strong contributions to their respective field. In particular, the Borich (1980) model has served as a needs assessment model utilized for years in the field of agricultural education. The Borich model consists of 5 phases and begins with the creation of competency statements. The competency statements can come from teacher effectiveness studies and/or from the intents and objectives of teacher trainers. The competency statements are used to construct an instrument used for the needs assessment. The second step in the Borich model is to survey the desired population. In this particular step, participants are asked to rate the relevance of given competencies to their career and their current ability of each competency. The third step in the Borich model is to calculate a ranking. For each particular competency, the discrepancy score is calculated across the 3 dimensions: knowledge, performance, and consequence. The discrepancies with the highest positive rank would have the highest priority for revising the training program. The fourth step in Borich's needs assessment model is to compare high priority competencies with training content. For example, when a competency is highly valued but poorly performed, the problem may root from insufficient training rather than ineffective training (Borich, 1980).

There have been several researchers that have utilized the Borich model as a means for conducting a needs assessment. Garton and Chung (1997) utilized the Borich model as a means for conducting a needs assessment for incoming teachers of agriculture. Additionally, Newman and Johnson (1994) also utilized the Borich model in their research titled: *In-Service Education Needs of Teachers of Pilot Agriculture Courses in Mississippi.* Specifically, the researchers sought to involve the learners in the process of planning an in-service educational program (Newman & Johnson, 1994).

Researchers in agricultural education have also utilized the Targeting Outcomes of Programs (TOP) model as a tool for program development and writing objectives in extension education (Bennett, Claude, and Rockwell, 1996). The TOP model (Figure 2) has been used in extension to identify and categorize program objectives and outcomes. It consists of 7 levels with inputs along with outputs that take place through Extension programming efforts (Bennett, Claude, and Rockwell, 1996). The inputs are on the left side and outcomes or outputs are set up on the right side. The shape of the model is a hierarchical model of 7 levels. The first and second levels (which begin at the bottom of the hierarchy) are resources and activities. The initial levels describe the things that extension does to produce and conduct activities. Level 3 (participation) through level 7 (social economic environmental conditions) are representative of the outcomes that result from the participation of clientele in Extension programs. Levels 5 (knowledge, attitudes, skills, aspirations), 6 (practices), and level 7 (social economic environmental conditions) are often seen as the 'real' impact levels of the hierarchy. Thus, the TOP model was used to identify the hierarchical level of program objectives for extension education. Once the extension personnel were able to identify at which level the objective was located, they were afforded a better opportunity to identify appropriate measures of program impact in the evaluation planning process (Bennett, Claude, and Rockwell, 1996).

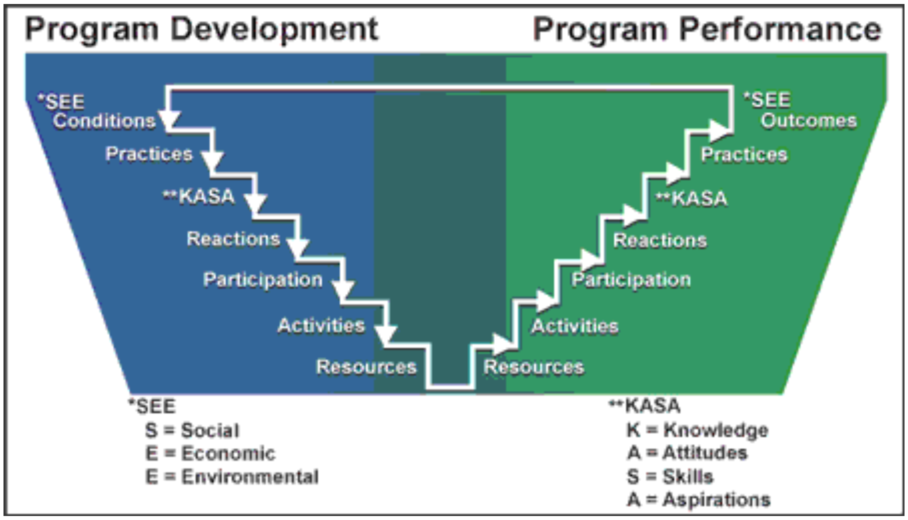

Figure 2. *Bennett Targeting Outcomes of Programs (TOP) Model*

Witkin (1984) cited a 1973 research report by Hershkowitz that proposes a *criticality function* that uses a 2 x 2 matrix to relate perceptions of goal importance to perceptions of goal attainment. Hershkowitz treated each respondent group separately. Researchers calculated the mean scores of importance and mean scores of attainment to establish criticality levels on the X and Y axes of the graph (Witkin, 1984). The researchers in the current study, the validation of the modified matrix analysis, have replaced the scores of attainment with mean scores of knowledge for the pre-test given to participants at the pre-harvest food safety workshop. Witkin (1984) also explains the functions of Hershkowitz's matrix. She describes it as two criticality levels plotted on a graph and divided into 4 quadrants: (S) successful program (for goals falling above the mean in both importance and attainment; (U) low-level successful program, for goals falling below the mean in importance but above the mean in attainment; (L) low-level need, for goals falling below the mean in attainment; and (C) critical need, for goals falling above the mean in importance but below the mean in attainment. Similar to Hershkowitz's (1973) study, the primary area of focus remains on the critical needs. An example is seen in figure 3.

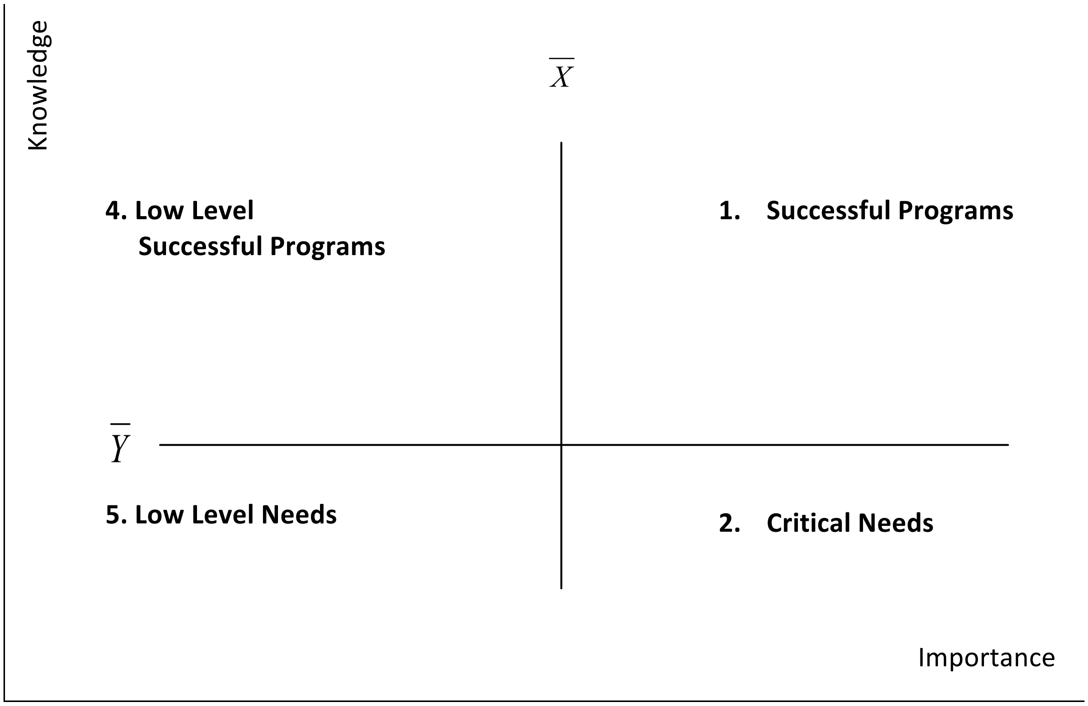

Figure 3. *The Modified Matrix Analysis*

This particular model has been seen frequently in research within the agricultural education profession. Akers, Miller, Fraze, and Haygood (2004), used the Matrix Analysis proposed by Witkin (1984) as a method for developing critical needs, high level successful abilities, low level needs, and low level successful abilities for their study exploring the importance and inclusion of emotional intelligence in the existing curriculum by agriculture education instructors. Jennings (2006) utilized the Matrix Analysis in her thesis as a means for setting program objectives for her study. Radhakrishna (2000) also utilized the Matrix Analysis as a means for determining critical professional development needs for extension specialists working for Clemson University. This was done while examining 3 constructs: program development and evaluation, research generation and synthesis, and communication and presentation.

However, a possible weakness of the matrix may be that researchers might ask participants to establish the importance of critical items that are beyond their scope of knowledge. Those individuals determining the topics should be individuals with applicable content knowledge.

With the weaknesses and shortcomings found in other needs assessments and program development, the Modified Matrix is identified as a more accurate and complete method of planning a workshop. In an effort to validate the Modified Matrix, researchers combined the Delphi method, Kirkpatrick's workshop development, and Witkin's Needs Assessment as a means for developing the conceptual framework for this study. This study seeks to combine the above items as tool for developing critical needs and content areas for a workshop and eventually validate the Modified Matrix. Thus, researchers propose the Modified Matrix as a means for conducting a needs assessment for developing workshop content, directed at educating professionals in a specific area.

Purpose and Objectives

The objective of the study is the following:

1. Determine the viability of using a Modified Matrix Analysis as a method of determining critical needs for feedlot managers in the area of food safety.

This needs assessment was one step in developing and delivering a face-to-face workshop during the summer of 2009 in collaboration with the National Cattleman's Beef Association.

Research Methods/Procedures

Population.

The population for this analysis consisted of two independent groups. The first group was involved in completing a modified Delphi study to determine content constructs and to rank them in order of importance. This panel consisted of experts from academia and industry in the area of pre-harvest food safety. There were 12 members of the group that provided content and responded to each round of the Delphi. They were originally nominated by members of the USDA grant that funded this research project. The second group consisted of those individuals who participated in the workshop.

Phase 1. Dephi study to determine content and importance of construct areas.

Step 1: The researchers used a Delphi analysis to determine workshop content areas for this study. A group of 27 experts in the area of beef pre-harvest (live cattle) food safety were identified and contacted for this portion of the study. Of the 27 experts, 12 agreed to participate in the study. These experts represented academia, food safety and the beef cattle industry. The first round of the Delphi commenced on February 26, 2008 with an initial question delivered to the panel using the Zoomerang online survey service. The original question posed to the expert panel was, "What information should be presented to feedlot managers regarding food safety?" The intent of this open-ended question was to determine the most important topics to be presented at a pre-harvest food safety workshop directed to feedlot management. A panel of social scientists analyzed the results of the first round and condensed the comments into 47 curricular constructs. These topics were re-submitted to the panel.

Step 2: The second round consisted of an instrument that included the 47 identified constructs with a 6 point Likert-type scale, beginning with a range of strongly disagree to strongly agree. For each item, the panel was asked to specify their level of agreement for inclusion in the workshop. This step was launched online on May 5, 2008 and remained available until all members of the panel completed the questions.

Step 3: The experts were then asked to review items they chose to include, and to determine if there were any items they would like to reconsider and remove from the workshop. Additionally, the experts were shown the list of items they chose to not include and were asked if there were any items they would like to reconsider and add to the workshop. Experts were instructed to simply check items they wished to reconsider.

Step 4: Researchers created a final instrument of all included constructs. The panel was asked to rate the accepted items by importance for inclusion in the workshop. This was conducted with a 10-point Likert-type scale. This would be the first component of the modified matrix analysis. Only the 10 highest total scores would be implemented in the workshop. Data collection using this panel was completed in November of 2008.

Phase 2. Multiple-choice test to determine participant knowledge of construct areas.

Time constraints of the two-day workshop led the researchers to only move forward with the ten constructs rated as most important by the expert panel. Multiple choice questions were created (four for each construct) with the help of International Center for Food Industry Excellence (ICFIE) personnel. The questions were reviewed for content validity and pilot tested using graduate students from the Department of Agricultural Education and Communications along with students from the Department of Animal Science from Texas Tech University. The graduate students participating in the pilot test were familiar with pre-harvest food safety issues.

Twenty-three feedlot managers and industry professionals participated in the two-day workshop. The participants were instructed to complete the knowledge test at the beginning of the first day. Scores were recorded as correct/incorrect. Each question consisted of four or five possible answers in a multiple choice format. The mean sum scores for each construct resulted in the second component of the Modified Matrix.

Results

The ranked topics from phase 1 of the Delphi study were narrowed to the ten most crucial items to be included, based on the average score each received. The items were ranked by the same twenty-seven industry and academia experts used throughout the entirety of the Delphi study. As previously mentioned, the items were ranked on a 10 point Likert type scale (1= lowest, 10 highest or most important to food safety). These items would become the constructs for the workshop. ICFIE personnel used the ten constructs to develop questions for the pre-test administered at the beginning of the workshop. There were four questions that were eventually developed for each of the ten constructs. The ten constructs are listed in table 1, beginning with the highest rated:

Table 1
Topic Areas and Importance mean score on a 10-point scale

	Topic Area	Importance Score
1.	**Reduction of E. coli 0157 H:7 in cattle**	8.50
2.	**Distillers grains**	8.50
3.	**Vaccine control**	8.50
4.	**Other interventions**	8.50
5.	**Transportation, lariage, and food safety**	8.43
6.	**Emerging issues**	8.21
7.	**Importance of food safety**	8.21
8.	**Dust**	7.92
9.	**Overview of E.coli 0157:H7**	7.79
10.	**Overview of Salmonella**	7.71

The workshop was conducted on June 17 and 18, 2009 at [State] University. There were twenty-three participants from across the United States. Prior to the workshop beginning, participants were handed a pre-test to determine knowledge level of specific pre-harvest food safety topics. The pre-test consisted of forty questions (ten constructs with four questions for each construct). Participants were allotted as much time as necessary to complete the pre-test. The mean knowledge score for each construct is displayed in table 2.

Table 2

Topic Areas and Knowledge mean score on a 4-point scale

	Topic Area	Knowledge Score
1.	**Reduction of E. coli 0157 H:7 in cattle**	1.32
2.	**Distillers grains**	2.24
3.	**Vaccine Control**	2.64
4.	**Other interventions**	1.64
5.	**Transportation, lariage, and food safety**	1.32
6.	**Emerging Issues**	2.04
7.	**Importance of food safety**	2.48
8.	**Dust**	2.64
9.	**Overview of E.coli 0157:H7**	1.64
10.	**Overview of Salmonella**	1.36

These 10 items were then plotted on the modified matrix analysis shown in figure 4. Individual knowledge scores from the participants were plotted on the X axis while the importance scores from the panel of industry experts were plotted on the Y axis. The results of the analysis showed that content areas (1) "Reduction of *E.* coli 0157 H: 7 in cattle using Direct-fed Microbials," (4) "Other Interventions," and (5) "Transportation, Lariage, and Food Safety" were determined to be critical needs. Thus, researchers were able to find an area the demanded the highest amount of attention at the workshop.

In addition, "Overview of E. coli 0157:H7" and "Overview of Salmonella" were found to be a low-level need. Therefore, these areas were devoted a small allotment of time during the workshop in comparison to the critical needs which were discussed at great length. The remaining six constructs identified by the industry panel were covered in the curriculum but only at the cursory level.

It is in this final step of research that sets the Modified Matrix apart from previously used needs assessments and program development models. Researchers can gain a clearer picture of industry needs combined with gaps in knowledge of noted topics by taking a glimpse at the Modified Matrix and making final decisions.

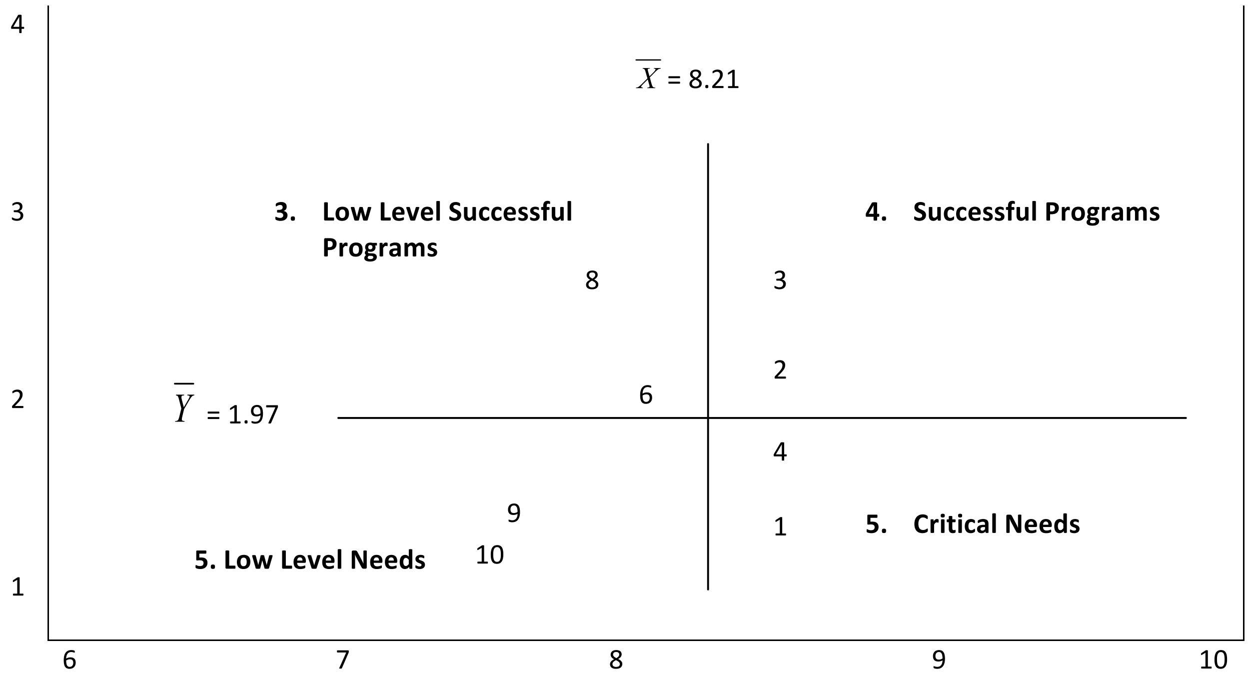

Figure 4. Results of the *The Modified Matrix Analysis*

Conclusions, Implications, and Recommendations

The researchers entered into this project with the intent of developing an accurate method of creating workshop content. Prior needs assessments using the matrix model placed all the responsibility of determining importance and knowledge of the content on the participants themselves. The researchers have developed a method of using the Modified Matrix to determine importance of items from people in the industry who are aware of current trends and issues and can speak to the topic content more effectively than someone on the frontline who may not be aware of new advances in the science of food safety. The participants are then tested on that content and the resulting matrix helps to identify areas of critical need. Workshop content is emphasized or deemphasized based on those results.

The results of this research show that the Modified Matrix can be used to determine critical needs. In this specific case, four construct areas were determined to be critical or low-level needs, thus giving workshop presenters areas of focus. The Modified Matrix is recommended when time is available and outside expert resources are needed to develop and deliver workshop content.

In future efforts, the researchers suggest looking at pretest/posttest scores to determine gain in knowledge immediately following the workshop as well as an extended period beyond to determine retention. Measurements can also be taken to determine additional outcomes of the model for workshop evaluation (figure 1) such as changes in attitudes, skills and behaviors. One recommendation would be to standardize the scale of measurement for both knowledge and importance to make results easier to interpret. Additional testing should take place on future workshops to validate the Modified Matrix as a viable means of conducting needs assessments.

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Student Farms at United States Colleges and Universities: Insights gained from a Survey of The Farm Managers

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ABSTRACT

Student farms at United States colleges and universities enhance curricula by integrating research, extension and teaching missions, reinforcing classroom instruction, and improving job training. Student farms are sites of agricultural production and marketing at which students have, through coursework and/or internships, opportunities to supplement classroom instruction with "real world" experience. Student farms and their influence on curricula began decades ago, but the number of farms and their impact have increased recently. Although increasingly numerous, the structure, programming, and operating principles of student farms have not been studied. A lack of knowledge regarding student farms hinders the development of new farms and ongoing success of existing farms. Therefore, an online survey of student farm managers was distributed in order to gain insights into the current status of student farms in the United States.

The data were used to determine that college and university student farms are diverse in operating characteristics. Though many groups contribute to successful farm operation, undergraduate students are the largest group to participate in and benefit from student farms. Working with a limited budget was the most significant challenge faced, though despite various challenges, farm managers on average, reported that their farms were operating successfully. Managers also indicated that their farm played a role in attracting students to attend their college or university.

INTRODUCTION

"The land grant institution was created under the Morrill Act with the purpose of, among other things, …to teach such branches of learning as are related to agriculture…" (Collier, 2002, p. 182). College and university student farms have been present on campuses throughout the United States for the duration of the passing of the Morrill Act. Student farms vary greatly in size and focus, but a common philosophy is their role in providing students with opportunities to gain valuable skills through applied experiences. In addition to acquiring various skills, involvement with a student farm allows students a concrete medium in which to solidify knowledge gained through coursework. Student farms currently operating across the United States offer a wide range of learning opportunities through which students can gain experience to supplement coursework, major programs and certificate programs, and provide opportunities for internships and volunteering.

The education basis for inclusion of student farm opportunities in curricula is grounded on the idea that these opportunities serve as a form of experiential education. Stated simply, experiential education is learning by doing (Andreasen, 2004), and the basis of this type of education rests upon a foundation of four pillars, including learning in real-life contexts, learning by doing, learning through projects, and learning by solving problems. The essence of experiential education is that of engaging students to "solve problems inductively, actively use and explain knowledge through solving problems, and make connections and apply knowledge beyond the classroom and school, based on real-life problems (Knobloch, 2003)."

John Dewey's name is associated with the term experiential education (Knobloch, 2003), and was an early proponent of this educational model. According to Dewey, "Education, in order to accomplish its ends both for the individual learner and for society must be based upon experience (Dewey, 1938)." Many others serve as strong proponents of the experiential education model (Mak, 1992; McKeachie,1999; Saddington, 1992). Thus, calls to incorporate experience-based learning into the curriculum in higher education, have been widespread (Boyer Commission, 1998; National Leadership Council for Liberal Education & America's Promise, 2007; U.S. Department of Labor, 1991).

Recommendations to shift agricultural curricula to an experiential learning model, grounded in real-life situations and problems (Francis, Lieblein, Helenius, Salomonsson, Olsen, & Porter, 2001; Knobloch, 2003) and specifically to incorporate farm-based experiences (Parr, Trexler, Khanna, & Battisti, 2007; Steiner and Vogel, 2005; Trexler, Parr, & Khanna, 2006), have been made by many. Student farms provide an excellent medium in which to present problem material to students (Murray, 1945). Consequently, various studies lend support to the inclusion of student farms in college curricula. For example, a survey of College of Agriculture Academic Associate Deans identified the importance of providing hands-on learning experiences as equally important with traditional teaching methods. In addition, findings from the study revealed that experiential learning and lecture tied as the most important practices used for teaching (Fields, Hoiberg, & Othman, 2003).

Benefits offered to students involved with student farms included the chance to develop a vast array of abilities, including critical thinking, decision making (Steiner and Vogel, 2005), problem solving (Trede, Soomro, & Williams, 1992), application of knowledge (Murray, 1945; Steiner and Vogel, 2005), sense of responsibility, leadership skills (Hillers, 1983), management skills (Murray, 1945), motivation, work ethic (Knobloch, 2003), and building of interpersonal relationships (Hillers, 1983; Trede et al., 1992). These abilities are crucial in the job market, as employers seek potential employees skilled in problem solving, critical and analytic thinking (Gordon, 1976), adaptability, effective communication, and ability to work as a member of a team (Washer, 2007), in addition to a practical background in agriculture (Mayer, 1980).

A changing student population provides additional support for the development of student farms, where students lacking practical knowledge can gain hands-on experience. Students enrolled in agriculture courses come increasingly from urban and non-farm backgrounds and therefore, lack practical knowledge in agriculture (Dyer, Breja, & Andreasen, 1999; Mayer, 1980; Scofield, 1995). Because these students lack practical knowledge, emphasis must be placed on including experience-based opportunities in curricula in order to properly prepare students for careers in agriculture.

In addition to the benefits students receive, student farms offer varied benefits to the colleges and universities at which they are located. One major benefit is the potential of attracting students to attend the college or university, or attracting students to pursue agricultural courses and majors. The student farm at North Carolina State University serves as an example of the potential that student farms offer in attracting students. The NCSU farm attracts involvement from a wide range of participants including students from a variety of disciplines, 63% from outside of North Carolina, 11% internationally, and 56% of whom have had no agriculture or related training (Schroeder, Creamer, Linker, Mueller, & Rzewnicki, 2006). At a time when attracting students into traditional agriculture programs is becoming increasingly difficult (Campbell, McConnell, Kane, & Miller, 2003), attraction to school farms is of tremendous importance.

Problem, Purpose, and Objectives

Though student farms have served a role in higher education for over a century, in recent years, development of these farms has increased significantly. Since 1990, at least 41 student farms have been established in the United States (The New Farm website, www.newfarm.org/depts/student-farm/directory.shtml) that met the following definition of student farms that was used in this study:

> Puts students to work in ways that teach them about crop production as well as direct marketing. All work—from planning to harvesting—is done by students. The farm demonstrates basic plant and animal husbandry, professional cultivation methods, integrated pest management and research. (Holzhueter, 2006, p.1)

With such strong interest in the development of these farms, research designed to gain a better understanding of the status of currently operating farms is imperative. In addition to providing valuable information to schools aiming to establish a student farm, this research will benefit farms currently in operation who are looking to learn from the experiences of others. Therefore, the purpose of this study was to describe the current status of student farms at colleges and universities in the United States, from the perspective of the farm managers.

Objectives guiding the study included describing farm managers' perceptions of:

1. demographics of student farms
2. participants and their roles at student farms
3. programming and operations of student farms

METHODS

Subject Selection

This study was conducted as a census of student farm managers at colleges and universities in the United States. Potential subjects were included on The New Farm website's Farming for Credit Directory, which lists college and university hands-on agricultural education opportunities. The list, including 79 college and university student farms, was obtained from http://www.newfarm.org/depts/student-farm/directory.shtml on February 19, 2008. Through searching university, college, and student farm websites, and through making personal phone calls, a manager for each farm was identified. In the case that a farm lacked a designated manager, the person referred to as *manager* was the faculty, staff, or student leader overseeing farm operations. Through making these contacts, in nine cases it was verified that student farms were not in operation, and therefore these schools were removed from the list.

To broaden the frame to include farms not listed on The New Farm website, various collection techniques yielded seventy farm managers who were sent an email requesting a list of five student farms at colleges or universities in the United States. Responses were added to the original list and duplicates deleted. Multiple farms operating on separate campuses within a college or university were included individually on the list. Ten previously unidentified student farms were discovered through this method, whose managers were then verified. These techniques yielded 80 college and university student farms whose managers served as the frame for this study.

Instrument Design

The researcher-designed questionnaire included four sections containing 36 quantitative and qualitative items designed to gain a better understanding of the current status of college and university student farms in the United States. The four sections focused on student involvement, programming, operating characteristics, and farm demographics. Content and face validity were established by a review from a panel of experts in Horticulture and Crop Science and Social Science.

Survey Implementation

Data were collected using Dillman's (2000) tailored design method. One week prior to survey launch, a handwritten postcard was hard-mailed informing subjects that notice of an electronic survey would be arriving in their email accounts the following week. On April 17, 2008, an email was dispersed to the target population detailing instructions for survey completion. Zoomerang™ online survey was used to administer the survey. The survey remained accessible through April 29, during which time non-respondents received two thank you/reminder emails encouraging them to complete the questionnaire.

Statistical Analysis

Data were analyzed using SPSS version XVI. Appropriate descriptive statistics including percentages, means, medians, modes, and standard deviations were used to describe the accessible population of student farms at colleges and universities in the United States.

RESULTS AND DISCUSSION

Of the 80 potential subjects receiving a survey invitation, 50 responses were received for a response rate of 62.5%. The majority of farms participating in the study were located at land grant universities (37%) or liberal arts colleges (37%), while some were located at non-land grant universities (15.2%), community colleges (8.7%), and technical colleges (2.2%). Geographically, farms were located primarily in the eastern United States and on the west coast (see Figure 1). The majority of colleges and universities at which these farms were located offered courses (85.1%) and major programs (59.6%) in agriculture.

Average farm size exhibited bimodal distribution, with the majority of farms being 0-4 acres (43.5%) or over 50 acres (30.4%). Principles on which farms operated included organic (77.8%), sustainable (62.2%), and traditional (28.9%). While a large percentage of farms were established prior to 1979 (38.3%), the majority have been established since 1990 (59.5%), with 10.6% established from 1990-1994, 17% established from 1995-1999, 17% established from 2000-2004, and 14.9% in 2005 or later (see Table 1).

As can be seen in Table 2, student farms reported a mean involvement of 60-69 students (sd, 5.71) annually, who represented 7-8 different majors. Of the students involved in the farms, a mean of 88% (sd, 1.85) were undergraduates while 48% (sd, 3.29) were agriculture majors. Students were driven to be involved with farms due to course requirements (mean, 37%; sd, 3.39), membership in a student organization (mean, 37%; sd, 3.58), volunteering (mean, 35%; sd, 3.14), work study (mean, 23%; sd, 2.93), internships (mean, 18%; sd, 1.95), and research projects (mean, 14%; sd, 1.58). In return for their involvement, 36% (sd, 3.26) received course credit, 35% (sd, 3.12) received pay, and 16% (sd, 2.22) received work study credit.

Students performed a range of farm responsibilities providing, on average, 64% (sd, 2.47) of farm labor, 52% (sd, 3.34) of student training, 50% (sd, 3.41) of implementing new projects and initiatives, 43% (sd, 3.55) of management decision making, 42% (sd, 3.73) of financial recordkeeping, 42% (sd, 3.91) of marketing products, and 40% (sd, 3.63) of worker supervision.

Various groups, besides students, also exhibited involvement in student farms (see Table 2). A mean of four faculty (sd, 3.29), and three staff (sd, 3.22) were involved in each student farm annually. While students provided the majority of labor, faculty, staff and volunteers also provided substantial work effort, providing 19%, 12%, and 8% of the work effort respectively. Farm managers evaluated undergraduate students as being very involved, faculty and staff as moderately involved, and graduate students, volunteers, and administrators as slightly involved. Regarding the importance of group involvement, managers perceived undergraduate student involvement to be extremely important, faculty and staff involvement as very important, volunteer and administrator involvement as moderately important, while the involvement of graduate students, alumni, and industry persons was perceived to be slightly important.

According to farm managers, undergraduate students received great value from the student farm, while departments, colleges, and communities received significant value. According to farm managers, faculty and universities received moderate value, while graduate students and the industry received slight value.

Student farms were associated with various programs and organizations on the campuses on which they were located (see Table 3). The highest percentage of farms were associated with a program in organic or sustainable agriculture (80%). A large majority of farms were also associated with horticulture and crop science programs (76.2%), and student organizations (75%).

Regarding programming offered by student farms, the majority of farms responding to the survey offered volunteering (85.7%), courses (77.6%), community activities (77.6%), internships (71.4%), field days (67.3%), and research projects (65.3%) as examples of programming efforts Lesser percentages of farms offered programs in academic majors (38.8%), certificate programs (22.4%), and adult education (20.4%) in association with the farm. On average, five courses were taught in association with each farm, and students enrolled in these courses visited the farm 6-7 times during undergraduate enrollment.

Though production focus varied greatly among farms (see Table 4), vegetable production was clearly most common, with 89.4% of farms producing vegetables which made up an average of 58% of each farm operation. Fruit crops were produced by 61.7% of farms (average 10% of operation), while farms also produced nursery or greenhouse plants (31.9%), forages (21.3%), sheep (17%), beef cattle (17%), and horses (17%).

Average annual operating budget for farms varied greatly from under $5,000 to over $125,000, (mean, $50,001-$55,000; sd, 9.98). Funding for both initial development and current operation of farms came from a variety of sources (see Table 5). College funds most commonly supported development of farms, providing an average of 30% of start-up costs, while universities (17%) and grants (17%) provided funding for development. Current operating costs derived most commonly from farm product sales (29%), colleges (23%), universities (14%) and departments (11%).

Various challenges were faced in operating student farms (see Table 6). Working with a limited budget was rated as most difficult, while gaining administrator support was considered challenging. Gaining faculty involvement and student interest were moderate challenges.

Student farm managers evaluated current operation of their student farm as extremely successful (8.5%), very successful (40.4%), moderately successful (44.7%), and slightly successful (6.4%). In addition, managers agreed their student farm played a role in attracting students to attend their college or university (see Table 7). Managers neither agreed nor disagree the farm served a role in attracting students from outside their state, while disagreement was expressed regarding the role the farm played in attracting students from outside the United States.

CONCLUSIONS/IMPLICATIONS/RECOMMENDATIONS

Student farms serve important roles in a range of educational settings, especially at institutions lacking major programs and courses in agriculture. Because a diverse audience of students can benefit from involvement, student farm opportunities should be available to all students. A variety of programming options offer the potential to attract involvement from the greatest number of students. Hands-on experience, the opportunity most commonly offered to students in farm courses and internships, is a component lacking in most college courses (Ewing & Whittington, 2009). These real-life opportunities for skill-development and application of knowledge are valuable and serve as an important supplement to classroom-based instruction.

Involvement of various groups is needed for successful operation of student farms. Students provide the majority of the work effort, yet for learning opportunities to be most effective, assistance from knowledgeable faculty and staff members is necessary.

While student farms were commonly associated with sustainable and organic agriculture programs and courses, valuable learning opportunities exist, and should be offered, in a variety of disciplines. The greatest proportion of farms operated using organic principles, yet operating on varied principles potentially offers the greatest educational experience by allowing students to compare and contrast differing production practices.

Benefits of student farms extend beyond simply helping students (Holzhueter, 2006). Universities, colleges, departments, faculty, and communities also received substantial benefit, and these factors need to be considered in making decisions regarding support and resources devoted to student farms. One potential benefit is the student farm's ability to attract students to attend a college or university. This characteristic needs to be capitalized upon by promoting the work of the farm and opportunities for involvement in various settings, including the recruitment of students.

Regardless of size, budget, and number of students involved, student farms are operating successfully. By continuing research and creating networking opportunities for those involved with student farms, farm success will be promoted and development of new farms facilitated.

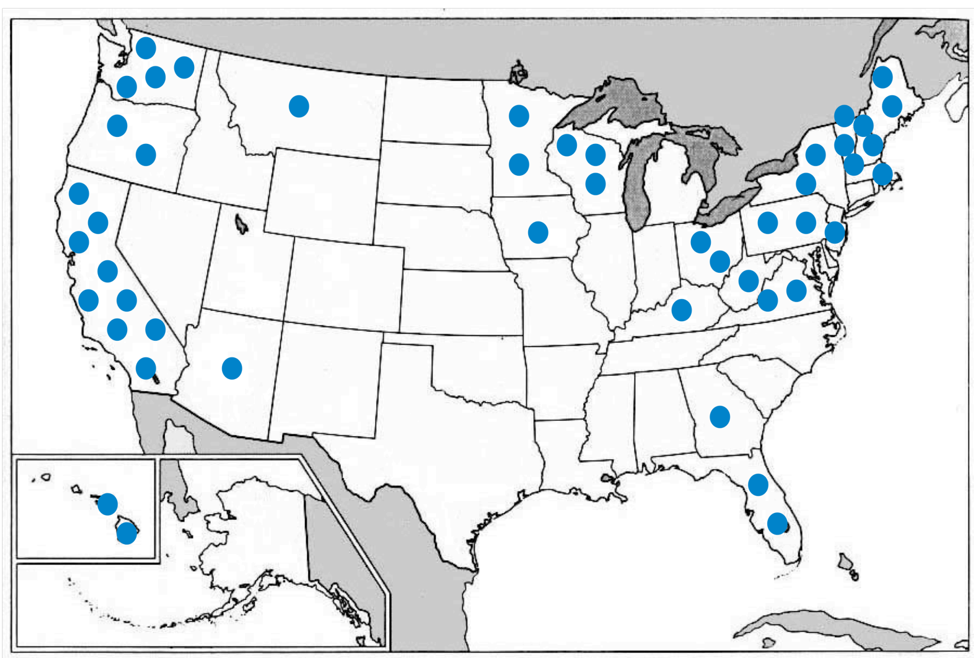

Figure 1. Location of U.S. college and university student farms participating in the study

Year farm was established	f*	%
Prior to 1979	18	38.3
1980-1984	1	2.1
1985-1989	0	0

1990-1994	5	10.6
1995-1999	8	17
2000-2004	8	17
2005 or later	7	14.9

*(n=47)

Table 1. Year of Establishment of College and University Student Farms in the United States

	Labor provided by %	Level of involvement*	Importance of involvement**
Undergraduate students	64	Very involved	Extremely important
Graduate students		Slightly involved	Slightly important
Faculty	19	Moderately involved	Very important
Staff	12	Moderately involved	Very important
Volunteers	8	Slightly involved	Moderately important
Administrators	1	Slightly involved	Moderately important
Alumni	1	Not involved	Slightly important
Industry persons	1	Not involved	Slightly important

*Scale: 1 = not involved, 2 = slightly involved, 3 = moderately involved, 4 = very involved, 5 = extremely involved
**Scale: 1 = not important, 2 = slightly important, 3 = moderately important, 4 = very important, 5 = extremely important

Table 2. Level of Involvement and Importance of Involvement of Various Groups Involved in U.S. College and University Student Farm Operations

Level of association	Agriculture		Horticulture, Crop Science, Plant Science, or Related Area		Animal Science		Organic or Sustainable Agriculture or Related Area		Environmental Studies		Work study program		Student organization		Campus initiative associated with sustainability	
	f****	%	f***	%	f*******	%	f*	%	f**	%	f******	%	f*****	%	f*****	%
Not associated	5	12.2	5	11.9	14	36.8	4	8.9	12	27.9	13	33.3	9	22.5	10	25
Slightly associated	7	17.1	13	31	6	15.8	6	13.3	13	30.2	12	30.8	10	25	12	30
Moderately associated	6	14.6	6	14.3	3	7.9	7	15.6	9	20.9	6	15.4	7	17.5	13	32.5
Strongly associated	17	41.5	13	31	7	18.4	23	51.1	7	16.3	5	12.8	13	32.5	2	5
Not applicable	6	14.6	5	11.9	8	21.1	5	11.1	2	4.7	3	7.7	1	2.5	3	7.5

*(n=45)
**(n=43)
***(n=42)
****(n=41)
*****(n=40)

******(n=39)
*******(n=38)

Table 3. Level of Association of Various Programs with College and University Student Farms in the United States

Production focus	% of farms producing	Average % of operation
Horses	17	5
Dairy cattle	10.6	5
Beef cattle	17.0	4
Swine	12.8	2
Sheep	17.0	3
Goats	4.3	0
Poultry	14.9	1
Grains	12.8	1
Forages	21.3	5
Vegetable crops	89.4	58
Fruit crops	61.7	10
Forestry crops	12.8	1
Nursery or greenhouse plants	31.9	4
Other	23.4	3

Table 4. Production Focus of College and University Student Farms in the United States

	Initial development		Current operations	
	Mean %	Std. dev.	Mean %	Std. dev.
Farm product sales	-----------	-----------	29	3.31
College	30	3.68	23	3.56
University	17	3.05	14	3.08
Grant	17	2.73	6	1.23
Department	9	1.91	11	1.97
Program	9	2.54	9	2.38
Students	6	1.43	5	1.72
Industry donations	5	1.78	4	1.57
Community Donations	5	1.32	2	
Alumni donations	4	.93	3	1.20
Faculty	4	.93	2	.50
Sustainability initiative	3	.98	2	.56
Campus dining services	2	.63	3	.95

Table 5. Funding Sources for Initial Development and Current Operation of College and University Student Farms in the United States

Student farm challenges	Working with a limited budget		Gaining student interest		Gaining faculty involvement		Gaining administrator support		Gaining community support	
	f*	%	f*	%	f**	%	f**	%	f***	%
No challenge	2	4.3	9	19.1	3	6.5	2	4.3	10	22.7
Slight challenge	5	10.6	17	36.2	8	17.4	7	15.2	19	43.2
Moderate challenge	14	29.8	10	21.3	15	32.6	15	32.6	13	29.5
Significant challenge	9	19.1	6	12.8	14	30.4	10	21.7	2	4.5
Great challenge	17	36.2	5	10.6	6	13	12	26.1	0	0
Mean	3.72		2.60		3.26		3.50		2.16	
Std. dev.	1.19		1.25		1.10		1.17		.83	

Scale ranged from 1 = no challenge to 5 = great challenge
*(n=47)
**(n=46)
***(n=44)

Table 6. Level of Challenge Posed by Various Factors in Operating College and University Student Farms in the United States

Role played by student farm in attracting students	**To attend my college or university**		**From outside of the state**		**From outside of the United States**	
	f*	%	f**	%	f***	%
Strongly disagree	4	8.3	8	17	18	39.1
Moderately disagree	4	8.3	3	6.4	10	21.7
Slightly disagree	0	0	5	10.6	4	8.7
Slightly agree	14	29.2	13	27.7	6	13
Moderately agree	13	27.1	10	21.3	1	2.2
Strongly agree	12	25	5	10.6	3	6.5
Not applicable	1	2.1	3	6.4	4	8.7
Mean*	4.27		3.43		2.11	
Standard deviation	1.63		1.81		1.62	

Table 7. United States College and University Student Farm Managers' Perceptions of the Role Played by Student Farms in Attracting Students From Various Locations to Attend a College or University

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An Assessment of the Animal Science Technical Skills Secondary Agricultural Education Graduates need for Employment in the Animal Science Industry: A Delphi Study

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Abstract

Career and technical education courses, such as agricultural education, exist, in part, to assist students in acquiring the competencies needed to achieve employability in the workforce. However, a lack of available research leads one to wonder if the current secondary agricultural education curriculum is meeting the needs of industry leaders who employ high school graduates of agricultural education programs. Therefore, this Delphi study sought to identify the technical competencies deemed necessary for entry-level employment of high school graduates in the animal science industry on their successful completion of coursework in the animal systems career pathway. Forty-two experts, representing the animal science industry in Oklahoma, participated in the study. In all, 133 competencies were yielded, revealing 48 different statements. Specifically, panelists "strongly agreed" that graduates should be able to "use basic math," "practice farm safety," and "understand animal needs." Because all 48 statements comprised the "real limits" of "agreement" (M = 2.50 – 3.49), it can be concluded that these skills should be included in the curriculum designed for the animal systems pathway component, and cross-walked with the current Oklahoma secondary animal systems career pathway to ensure that students enrolled in animal science are provided opportunities to learn the skills employers seek.

Introduction

Our nation is facing a dilemma. An "unprecedented shortage of skilled workers" (Gray & Herr, 2006, p. 17), which is projected to lead to a 5% decrease in our nation's gross domestic product is predicted. Previous research by Gray and Herr showed that 30% of high school graduates seeking employment were not provided the necessary skills in high school, which has resulted in high unemployment rates of high school graduates (College Enrollment and Work, 2008). Even though the number of students pursuing post-secondary education has increased over time, a large number of American high school graduates seeking employment following completion of secondary education still exists (College Enrollment and Work).

Although high school graduates are seeking employment, our nation faces the compounding issue of a shortage of skilled workers because "baby boomers" are retiring at an alarming rate. This condition is creating a rapid depletion of employees in the job market, thus, prompting a massive need to fill these vacated positions (Carnevale, 2003). The term "baby boomer" refers to those individuals who were born between 1946 and 1964 (Kamalick, 2007). According to Kamalick, the "wave of Boomer retirees will take on biblical proportions in 2012, when the first Boomers achieve 66 years and become eligible for full retirement benefits" (p. 14).

Additional changes in the employment sector are occurring simultaneously with the retirement of baby boomers. These changes include jobs which require at least some technical training or post-secondary education (Carnevale). Ellwood (2001) projected that, although our workforce has seen an increase in employers by 35% in the past 20 years, the combination of job market shifts will cause employment growth to slow to 16% over the next decade, which will result in an even greater shortage of workers. In fact, Carnevale projected that an increase of at least 20 million workers will be needed in the United States job market over the next 20 years.

The "New Basics" curriculum presented in *A Nation at Risk: The Imperative For Education Reform* (1983), represented the idea that "high school curriculum should also provide students with programs requiring rigorous effort in subjects that advance personal, educational, and occupational goals, such as the fine and performing arts and vocational education [i.e., Career and Technical Education]" (p. 20). Career and technical education (CTE) programs provide students with entry-level competencies for careers (Lynch, 2000). However, controversial legislative acts, such as NCLB, "seem most likely to ignore these kids [who are not pursuing post-secondary education] or even to justify their neglect and the elimination of programs – such as high school CTE – that could serve them by providing occupational skills that pay well and are in demand" (Gray & Herr, p. 12). Further, Castellano, Stringfield, and Stone III (2003) stated, "although many argue that preparation for jobs should be concentrated primarily in the postsecondary phase of students' lives (e.g., in community and technical colleges), many students are developmentally ready to prepare for occupations at earlier ages" (p. 245).

Cohen and Besharov (2002) identified that 93% of public schools in the United States offer one or more courses under the CTE umbrella. Beyond general introductory courses, areas of specialization are offered to students with specific industry interests. CTE programs experienced a steady increase in enrollment until the early 1980's (Cohen & Besharov; Lynch). However, from 1982 to 1994, a sudden decline in enrollment numbers occurred. Reasons for the decline ranged from the lack of CTE programs meeting the needs of students to an increase in college preparatory classes (Lynch).

Findlay (1993) surmised that regardless of the profession, "competence in one's professional work role is important in the overall learning process" (p. 46). Further, Stanford (2002) concluded, "involvement in career oriented education programs at the high school level can give students the experience needed to help with career placement once leaving the school setting" (p. 1). Therefore, providing a curriculum in which students can acquire technical skills is essential because preparing for the workforce "should begin sometime in high school" (Lynch, p. 7).

Efforts have been made to reform CTE curriculum to include more "rigorous industry standards, and higher academic standards and related general education knowledge" (Lynch, p. 3). The purpose of the *Carl D. Perkins Career and Technical Education Improvement Act of 2006* (Perkins IV) was to "develop more fully the academic and career and technical skills of secondary education students and postsecondary education students who elect to enroll in career and technical education programs" (p. 683), which allows students enrolled in CTE the opportunity to train for the workforce and prepare for college simultaneously (Roberts & Ball, 2009). Additionally, it parallels themes intended to be addressed by education, including preparation for high skill, high wage, high demand careers, and the integration of academic and technical education. Further, it strengthens America's workforce to be competitive in the global economy (Martinez Jr., 2007).

To ensure students are provided opportunities to acquire the needed skills to be competitive in the workforce, CTE has endorsed the use of the 16 Career Clusters (Ruffing, 2006). Career clusters are "groupings of occupations/career specialties" (Oklahoma Career Clusters Initiative, 2008) manifested by career pathways, which provide knowledge and skills for their respective career cluster. The purpose of the 16 Career Clusters is to address the needs of increasing integration of standards from both academia and industry while encompassing curricula changes and tools for measuring assessments of the program concurrently (Ruffing).

In response to the 16 Career Clusters created by the National Association of State Directors for Career Technical Education Consortium (NASDCTEC) (2008), Oklahoma agricultural education implemented curriculum standards based on the 16 Career Clusters into its programs in 2006. This inclusion sought to "ensure that Oklahoma agricultural education student's [would] have the skills and abilities to be successful in college or successful in the workplace" (Oklahoma Agricultural Education, 2007b).

Seven total career pathways were created for the Agricultural, Food, and Natural Resource career cluster consisting of agribusiness systems; animal systems; environmental service systems; food products and processing systems; natural resource systems; plant systems; and power, structural and technical systems. In addition to these seven pathways, students can be administered competency examinations in their respective areas to determine the success the program had on preparing them for the workforce in that particular career pathway. These examinations provide information for future employers to assess potential employees' abilities within their chosen career of study and their readiness for employment.

Career clusters are one answer to the changes and demands detected in the agricultural industry and agricultural education, a component of CTE. Thompson and Balschweid (1999) reported that "increased high school graduation requirements have pressured agricultural programs by limiting opportunities for students to enroll in elective courses" (p. 73). Further, "in 1988, the National Research Council recommended that agricultural courses be expanded to increase the rigor of scientific and technical content to better prepare students for advanced study and employment" (Warnick, Thompson, & Gummer, 2004, p. 62). Additionally, it was concluded that the integration of science in agricultural education classes produced a positive impact on students' test scores on standardized tests (Chiasson & Burnett, 2001; Thompson & Balschweid).

The teaching of science in agricultural classes, or agriscience as it is called in many states, is a concept that has been around for nearly 100 years (Warnick & Thompson, 2007). To enhance visibility, programs across the United States have begun offering science credits to students taking approved agricultural education courses (Chiasson & Burnett). Budke (1991) postulated that "agriculture provides a marvelous vehicle for teaching genetics, photosynthesis, nutrition, pollution control, water quality, reproduction, and food processing where real life examples can become part of the classroom experimentation and observation" (p. 4). The concept of integrating the two subjects could produce a more effective way of teaching science (Warnick et al., 2004). Science and agriculture are integrated in the animal systems career pathway, which is one of seven pathways offered in Oklahoma agricultural education programs.

This study was based on the supposition of the Human Capital Theory. Human capital is a form of increasing one's employability due to increased education and training (Becker, 1964; Shultz, 1971). According to Little (2003, p. 438),

> The propositions of human capital theory were that the skills that people acquire are a form of capital, human capital; that these are acquired through deliberate investments in education; that skills are the capacities that contribute to economic production; and that earnings in the labour market are the means by which a person's productivity is rewarded.

Schultz stated, "education has become a major source of economic growth in winning the abundance that is to be had by developing a modern agriculture and industry" (p. 56). Becker further explained that "many workers [and students] increase their productivity by learning new skills and perfecting old ones while on the job [or through work-experience programs]" (p. 9).

In line with the human capital theory, Roberts and Ball (2009) developed a conceptual model to provide an understanding of the role of the 21st century agricultural industry plays in agricultural education programs (Figure 1). Based on the model, curricula utilized in agricultural education courses should reflect the needs of the industry. Therefore, teachers must "stay current in the technical content of the profession [i.e., agricultural industry]" (Talbert, Vaughn, Croom, & Lee, 2007, p. 57) because the agricultural industry "provides the basis for the curricula taught and for teacher preparation" (Roberts & Ball, p. 83). Moreover, instructors should "provide industry-relevant instruction that results in observable skill acquisition" (p. 83). The end result is for students to acquire skills and competencies which enable them to gain successful employment.

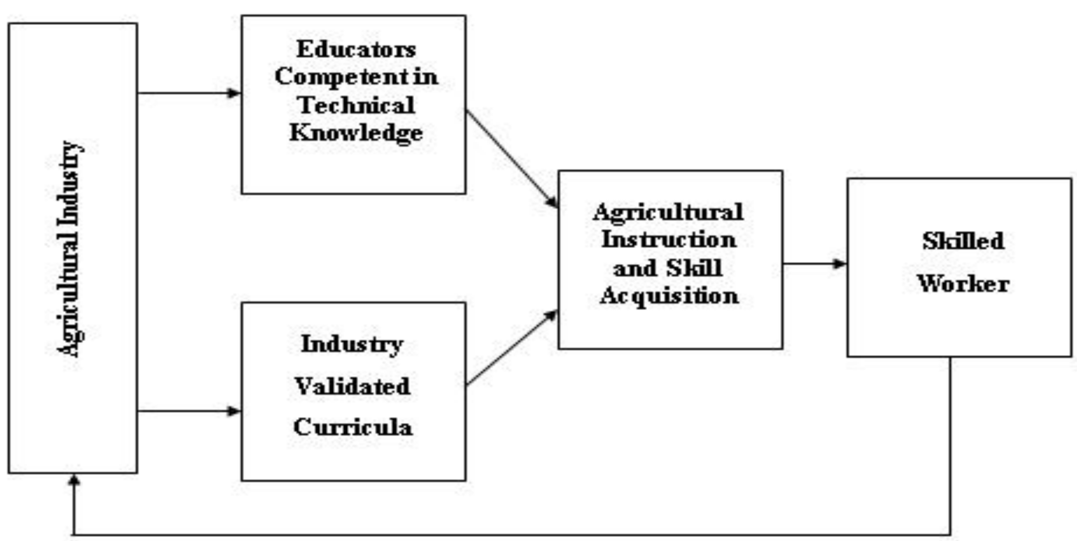

Figure 1. A content-based model for teaching agriculture (Roberts & Ball, 2009).

Although it preceded the Roberts and Ball model, NASDCTEC created the 16 Career Clusters designed to assist students in achieving skills needed for employability in specific career-oriented subject areas. This includes the Agriculture, Food, and Natural Resources cluster, which contains an animal science career pathway (Oklahoma Career Clusters, n.d.). The pathway allows for a sequence of courses to be completed by students interested in pursuing a career or post-secondary education in animal science. Further, the career pathway serves as a vehicle for curriculum delivery which could include competencies necessary for entry-level employment of students in the animal agriculture industry following their high school graduation.

Statement of the Problem

To a degree, career and technical education exists to provide the necessary tools and skill sets for successful student employment in the agricultural industry (Phipps & Osborne, 1988). However, a lack of available research leads one to wonder if the current curriculum, such as the 16 Career Clusters followed in Oklahoma, is meeting the needs of agricultural industry leaders who employ high school graduates of agricultural education programs. If students do not acquire these competencies deemed necessary by employers, they decrease their probability of employment in the future, thus, increasing the number of unemployed high school graduates in the United States (College Enrollment and Work, 2008; Gray & Herr, 2006).

Purpose/Objective

The purpose of this study was to describe the perceptions of Oklahoma animal science industry leaders as it related to competencies necessary for the entry-level employment of high school graduates who had completed coursework in the Oklahoma Agricultural, Food and Natural Resources, animal systems pathway. Therefore, the objective of this Delphi study was to identify the technical competencies deemed necessary for entry-level employment of high school graduates in the animal science industry on their successful completion of coursework in the animal systems career pathway.

Methods

The Delphi technique was employed for this study. Specifically, the Delphi technique accumulates responses from a panel of experts within a given content specialization area until consensus is reached (Delp, Thesen, Motiwalla, & Seshadri, 1977; Stitt-Gohdes & Crews, 2002). Further, "the Delphi technique is a method of eliciting and redefining group judgments" (Dalkey, 1969, p. V) in which anonymity, controlled feedback, and statistical group response are the norm. Stewart (2001) affirmed that the knowledge gained from professional educators using the Delphi technique is extremely useful in uncovering information that is often not verbalized.

The population for this study was Oklahoma animal science industry experts from nine areas of specialization: beef cattle; dairy; equine; goat; implements/miscellaneous; poultry; sheep; swine; and veterinarians. Stitt-Gohdes and Crews stated that, "careful selection of the panel of experts is the keystone to a successful Delphi study" (p. 60). Therefore, panel members were selected using a purposive sampling technique. According to Gay, Mills, and Airasian (2006), a purposive sampling "is the process of selecting a sample that is believed to be representative of a given population" (p. 113).

A sample population of (n = 42) was obtained for the study. A professor of animal science, Department of Animal Science, Oklahoma State University suggested panel members based on personal and professional interactions. The criterion used for selecting individuals was based on their prior experience and knowledge of the industry as it pertained to employment, including entry-level employees. For example, only those individuals who had previously hired or would consider hiring high school graduates were considered for this study. Additionally, all experts who served on the panel were affiliated with the animal science industry in the state of Oklahoma. Finally, only those individuals who had access to the Internet and could respond to the questionnaire via electronic mail (e-mail) were considered as panel members because a computer version of the Delphi technique "has the advantage of eliminating the delay caused in summarizing each round of Delphi . . ." (Turoff & Linstone, 2000, p. 5).

Dalkey stated that when a Delphi group is larger than thirteen members, a reliability of at least .80 can be achieved. Of the 42 participants selected to participate, 32 responded in Round One for a 76.2% response rate. Round Two returned 26 respondents for a 61.9% response rate. Finally, in Round Three, 24 participants responded for a 57.1% response rate. As such, reliability was maintained throughout the study (Dalkey).

The instrument used for the Delphi study consisted of a three-round, Web-based questionnaire. The initial questionnaire was created by the researcher and committee members containing the open-ended objective. Statements acquired in Round One were analyzed and categorized into eight technical themes by three independent coders (Montgomery & Crittenden, 1977).

Panelists were asked to rate technical statements using a four-point summated-rating scale in Round Two. Based on panel members responses, statements receiving a mean rating of 3.00 or higher were considered by the researcher to have reached consensus from the expert panel. Per Round Two, 27 technical statements reached consensus from panelist. Further, statements that received a mean rating of less than 3.00 were resubmitted to panel members via Round Three for additional assessment. In Round Three, panelists were asked to "agree" or "disagree" with the statement. If they did not agree with the statement, they were encouraged to re-write the statement so that they would agree. Of the 21 statements re-submitted to panelist in Round Three, 20 statements were agreed to by two-thirds of the panelists, thus reaching consensus.

Findings

This study's objective was to identify technical competencies deemed necessary for students' entry-level employment in the animal science industry following high school graduation. After the initial distribution of the Round One questionnaire, 133 statements were collected from the 32 respondents. This procedure produced 48 technical competency statements for Round Two. The statements were organized into eight thematic categories: Animal Handling/Husbandry (5 competencies); Animal Selection and Evaluation (4 competencies); Business, Marketing and Data Management (11 competencies); Health and Nutrition (10 competencies); Operation and Maintenance of Tools and Machinery (5 competencies); Policies and Food Safety (4 competencies); Production Agriculture (3 competencies); and Reproduction and Genetics (7 competencies).

Based on panel members' responses, 27 of the 48 statements reached consensus of agreement by receiving a mean rating score of 3.00 or higher (Table 1) during Round Two. Of those, seven (25.9%) statements were from Business, Marketing and Data Management; six (22.2%) statements from Health and Nutrition; four (14.8%) statements came from Operation and

Maintenance of Tools and Machinery; four (14.8%) statements from Reproduction and Genetics; three (11.1%) statements came from Animal Handling/Animal Husbandry; two (7.4%) statements from Policies and Food Safety; one (3.7%) statement came from Animal Selection and Evaluation; and one (3.7%) statement from Production Agriculture. The remaining 21 statements not reaching consensus (i.e., M = 2.99 or less) were sent back to panel members in Round Three of the study.

The three statements on which participants strongly agreed high school graduates of the animal systems should possess were "use basic math skills" (M = 3.54; SD = 0.51), "execute general farm safety practices" (M = 3.54; SD = 0.65), and "understand animal needs" (M = 3.54; SD = 0.65) (Table 1). Additionally, participants reached agreement ($M = \geq 3.00$) on 24 statements ranging from "identify unhealthy animals" (M = 3.46; SD = 0.58) to "operate Microsoft Office" (M = 3.04; SD = 0.87) (Table 1).

The bottom five statements on which participants agreed least were "perform general welding practices" (M = 2.69; SD = 0.68), "understand commodity markets" (M = 2.69; SD = 0.68), "understand general agricultural politics" (M = 2.62; SD = 0.57), "interpret expected progeny differences" (M = 2.62; SD = 0.90), and "evaluate and comprehend carcass data" (M = 2.50; SD = 0.86).

Table 1

Agreement Levels for Entry-level Technical Skills Needed in the Animal Science Sector According to Animal Science Experts per Round Two of the Delphi Procedure (N = 26)

	Statement	Topic Theme[a]	M	SD	% Agreement (marked 3 or 4)[b]
1.	Use basic math skills	BMDM	3.54	.51	100.00
2.	Execute general farm safety practices	OMTM	3.54	0.65	92.30
3.	Understand animal needs	AH/H	3.54	0.65	92.30
4.	Identify unhealthy animals	H&N	3.46	0.58	96.15
5.	Operate farm equipment in a safe manner	OMTM	3.42	0.64	92.30
6.	Value general animal health	H&N	3.35	0.63	92.30
7.	Read and interpret equipment operating procedures	OMTM	3.27	0.53	96.15
8.	Understand male and female	ASE	3.27	0.67	88.46

	anatomy of specific livestock/equine				
9.	Record and maintain relevant data	BMDM	3.23	0.65	88.46

Table 1 (continued).

	Statement	Topic Theme[a]	*M*	*SD*	% Agreement (marked 3 or 4)[b]
10.	Understand basic animal reproduction	R&G	3.19	0.63	88.46
11.	Use basic accounting skills	BMDM	3.19	0.69	84.61
12.	Monitor an unhealthy animal	H&N	3.15	0.61	88.46
13.	Understand strengths and weaknesses of artificial insemination versus natural service breeding programs	R&G	3.12	0.65	84.61
14.	Follow basic business policies, laws, and legalities	BMDM	3.12	0.86	92.00
15.	Understand livestock/equine 'point of balance' and behaviors when handling	AH/H	3.08	0.63	84.61
16.	Transport livestock/equine	AH/H	3.08	0.63	84.61
17.	Create career development documents	BMDM	3.08	0.69	80.76
18.	Understand livestock/equine nutrition	H&N	3.08	0.69	80.76
19.	Understand proper use of antibiotics, vaccinations, other medical remedies	H&N	3.08	0.74	76.92
20.	Identify prevalent agricultural policies at the state and national level	P&FS	3.08	0.74	53.84
21.	Administer antibiotics and vaccinations	H&N	3.07	0.74	76.92
22.	Understand selected aspects of production agriculture	PA	3.04	0.53	88.46

23.	Understand available markets for specific livestock segments	BMDM	3.04	0.66	80.76
24.	Create and send emails	BMDM	3.04	0.72	76.92

Table 1 (continued).

	Statement	Topic Theme[a]	*M*	*SD*	% Agreement (marked 3 or 4)[b]
25.	Understand bio-security threats in the agriculture industry	P&FS	3.04	0.77	80.76
26.	Recognize gestation periods for various livestock/equine	R&G	3.04	0.77	73.07
27.	Operate Microsoft Office	BMDM	3.04	0.87	84.00
28.	Use basic mechanical tools	OMTM	2.99	0.49	88.46
29.	Prevent bio-security risks	P&FS	2.99	0.75	80.76
30.	Feed livestock	H&N	2.96	0.66	84.61
31.	Brand/tag livestock/equine in a safe manner	AH/H	2.92	0.63	76.92
32.	Demonstrate work experience in the livestock industry	PA	2.88	0.59	76.92
33.	Describe significant livestock/equine breeds and their relation to industry	ASE	2.88	0.77	65.38
34.	Recognize nutritional needs pre/post breeding	H&N	2.88	0.86	65.38
35.	Evaluate livestock/equine based on composition	ASE	2.85	0.67	69.23
36.	Understand basic elements of plant and soil sciences	PA	2.81	0.63	69.23
37.	Identify the strengths and weaknesses of individual pedigrees	R&G	2.81	0.63	69.23
38.	Break/train livestock/equine	AH/H	2.81	0.63	65.38

39.	Identify causes of animal illnesses/diseases and parasites	H&N	2.81	0.75	61.53

Table 1 (continued).

	Statement	Topic Theme[a]	*M*	*SD*	% Agreement (marked 3 or 4)[b]
40.	Understand the estrus cycles of various species	R&G	2.81	0.94	68.00
41.	Understand various feed intakes	H&N	2.77	0.71	69.23
42.	Perform basic marketing skills	BMDM	2.77	0.82	53.84
43.	Perform a cost/benefit analysis to determine potential costs, profit, and losses	BMDM	2.77	1.03	56.00
44.	Perform general welding practices	OMTM	2.69	0.68	65.38
45.	Understand general agricultural politics	P&FS	2.62	0.57	57.69
46.	Understand commodity markets	BMDM	2.62	0.70	57.69
47.	Interpret expected progeny differences	R&G	2.62	0.90	56.00
48.	Evaluate and comprehend carcass data	ASE	2.50	0.86	42.30

Note. [a]BMDM = Business, Marketing, and Data Management; P&FS = Policies and Food Safety; OMTM = Operation and Maintenance of Tools and Machinery; H&N = Health and Nutrition; R&G = Reproduction and Genetics; PA = Production Agriculture; AH/H = Animal Handling/Husbandry: ASE = Animal Selection and Evaluation
[b]Scale: 1 = Strongly Disagree; 2 = Disagree; 3 = Agree; 4 = Strongly Agree

Conclusions

This Delphi study sought to identify the technical competencies deemed necessary for entry-level employment of high school graduates in the animal science industry on their successful completion of coursework in the animal systems career pathway. Round One data yielded 133 technical statements. These responses were collapsed (i.e., removal of duplicate statements) into 48 technical statements for the expert panel members to rate during Round Two of the study. Of these, 21 statements reached consensus of agreement in Round Two. The 21 remaining statements were re-submitted to the panelists per Round Three, by which 20 reached consensus. The lone statement that did not reach consensus came from the theme of Policies and Food Safety. However, because panelists ranked all 48 statements in Round Two within the "real limits" of "agreement" (M = 2.5 – 3.49), it was concluded that these statements should be included in the curriculum designed for the animal systems pathway component of secondary agricultural education in Oklahoma.

Specifically, the theme areas "Business, Marketing, and Data Management" and "Health and Nutrition" represented the largest number of accepted statements. Notably, panelists "strongly agreed" that entry-level employees should be able to "use basic math," "practice farm safety," and "understand animal needs" to be employable in the animal science industry.

Recommendations for Practice

It is recommended that secondary agricultural education instructors seek out opportunities to integrate basic math into their existing animal science lessons per the animal systems pathway. Professional development and in-service workshops should focus on helping agricultural education instructors recognize where math naturally exists within the animal systems pathway and determine ways in which it can be emphasized in animal science lessons. Specifically, instructors should be exposed to models and methods which would enable them to integrate math through the context of agriculture (Parr, Edwards, & Leising, 2006).

Additionally, secondary agricultural education instructors should emphasize general farm safety in animal systems pathways courses. Typically, "safety" is a unit predominantly taught in secondary agricultural power and technology courses. Because it was an important finding in this study, secondary agricultural education instructors should seek ways to highlight safety in secondary animal science courses. Again, professional development and in-service training seminars should exist to help instructors emphasize, or in some cases include a complete unit of instruction on general farm safety, as it relates to handling livestock and operating machinery in the animal science industry.

Recommendations for Future Research

It is recommended that this study be replicated in other states. It is possible that important entry-level skills identified in this study would be similar to other states. However, because of cultural and ethnical differences, geographic location, and variation in the agricultural industry, future studies could produce different technical skills preferred by employers in their respective states. If so, then adjustments would need to be made to meet the needs of employers to ensure that high school graduates of agricultural education receive appropriate instruction to prepare them for future employment in the animal agriculture industry.

Further, the views and opinions of students and agricultural education instructors should be described in future studies. Although employers' needs have been examined, it is important to remember that students are the primary and foremost clientele that secondary agricultural education serves. The building of their human capital (Shultz, 1961) is dependent on the skills and knowledge gained in secondary education, which is presented to them by their instructors. Students' perceptions coupled with investigating agricultural education instructors' viewpoints and triangulating their responses with this study's findings could further improve the appropriateness of the animal systems pathway curriculum.

Additionally, the findings of this study should be cross-walked with the current Oklahoma secondary animal systems career pathway. If the study's findings are not substantially congruent with the current curriculum taught in the animal systems career pathway, i.e., deficiencies exist, curriculum revisions should be made to ensure the 27 technical competencies, on which industry experts agreed, are evident. If modifications to existing animal systems curriculum are forthcoming, then, it is recommended that additional research be conducted to examine the impact the changes made to the curriculum had on entry-level graduates' employability.

The Agricultural, Food and Natural Resources career cluster in Oklahoma provides students the opportunity to complete competency examinations upon their completion of a pathway. Therefore, it is recommended that the statements agreed to by the Delphi panelists be compared to competency examination test items in the animal systems career pathway. These comparisons would provide further insight in determining if animal systems curriculum, testing materials, and industry demands are aligned.

Finally, while this study sought to determine the skills high school graduates should possess on entrance into the animal science sector, it is recommended that future studies in other areas of the secondary agricultural education curriculum be pursued. For instance, what skills are deemed necessary for employment in the remaining six pathways, e.g., Agricultural Communications pathway, Agribusiness and Management pathway, as perceived by employers?

Implications and Discussion

Currently, secondary agricultural education is divided into curriculum areas based on the Agricultural, Food and Natural Resources Career Cluster and represented by seven pathways. As outlined by Oklahoma Agricultural Education (2008), clustering similar occupations, such as animal systems, with outlined curriculum may enable students to learn competencies better that are necessary for success in college as well as the workplace. This approach is congruent with Roberts' and Ball's (2009) philosophical assertions about agriculture as a *context* and *content* domain for student learning. Further, this implication is supported by the theoretical framework posited by Human Capital Theory. As stated by Shultz, among the five best ways to improve human capital are "formally organized education at the elementary, secondary and higher levels . . ." (p. 9) and to provide humans with opportunities to acquire skills needed in the labor force.

Similarly, it could be assumed that competencies acquired in the animal systems pathway not only enhance students' probability of entry-level employment in related industry, but also provide a vehicle for the integration of core academics, such as mathematics and science. This implication is supported by Balschweid and Huerta (2008) who concluded "teaching advanced life science within the context of animal agriculture can enhance students' immediate marketability in the work place and provide students a launching pad for post-secondary educational pursuits" (p. 18).

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Examining Secondary Agricultural Educators as Transformational Leaders at the Local Level: A Qualitative Case Study

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Abstract

Agriculture teachers are recognized by students, school administrators, parents, and community members as the leaders of the agriculture program. This case study examined the leadership styles of two agriculture teachers in a high quality secondary agriculture program. The transformational leadership approach of Bass and Avolio provided the framework to explore the leadership styles of the agriculture teachers as perceived by those closely associated with the agriculture program. All 15 individuals who participated in the case study provided specific examples of the agriculture teacher's behaviors which align with the four factors associated with transformational leadership. The results of this study suggest that the transformational leadership style of the agriculture teachers was a very positive and effective way to lead. Future research should examine transformational leadership of teachers in a broad (national) sample and evaluate other leadership models which may be beneficial for secondary agricultural education programs.

Introduction/ Theoretical Framework

For decades agricultural education has been making a positive difference in the lives of students and communities across the nation. The opportunities afforded to students enrolled in high quality agricultural education programs are countless; students can gain diverse and practical experience in a hands-on fashion through a wide variety of classroom/laboratory, FFA, and supervised agricultural experience (SAE) activities. The magnitude and degree of agricultural education's impact may be difficult to fully measure; however, it is conceivable that countless individuals have gained competencies through agricultural education that enabled them to become successful members of society. Furthermore, quality agricultural education programs have played a significant role in the leadership development and personal growth of students.

The extent to which agricultural education has a positive impact on students and communities is greatly dependent on the number of high quality programs. The profession has taken note of the importance of this issue evident by the National Council for Agricultural Education's (The Council) "10X15" plan. The goal of the "10X15" plan is to have 10,000 *quality* agricultural education programs in place by 2015 (2007). To accomplish this goal, effort is needed by all who support agricultural education. The quality and success of the program are dependent upon many individuals and factors; however, none carry a greater weight of responsibility for the program than the agriculture teacher(s). Experts may opine that in order to have high quality agriculture programs there must be high quality agriculture teachers leading the way. In fact, Roberts and Dyer (2004) stated, "Creating effective agriculture teachers is imperative for the long-term sustainability of agricultural education programs" (p. 94).

Therefore, determining what is required to become an effective agriculture teacher is extremely important. Several studies (Harlin, Roberts, Dooley, & Murphrey, 2007; Roberts & Dyer, 2004; Rosenshine & Furst, 1971) provide valuable insight on characteristics and competencies needed for effective teaching. Research has shown that the effectiveness of an agriculture teacher is dependent upon their development of personal qualities and leadership skills. Additionally, literature indicates that leadership experiences of the teacher have a positive influence on program quality and leadership development of students (Bell, 1996; Dodson & Townsend, 1996; Dyer & Osborne, 1996; Fritz, 1996; Gliem & Gliem, 1999; Vaughn, 1976; Vaughn & Moore, 2000; von Stein & Ball, 2007). Greiman, Addington, Larson, and Olander (2007) believe that the teacher is the most important person to assist youth in developing leadership through involvement in an agricultural education program.

Agriculture teachers are recognized by students, school administrators, parents, and community members to run and maintain the agriculture program. They are charged with preparing students “for a lifetime of informed choices in global agriculture, food, fiber, and natural resource systems” as well as developing students’ “potential for premier leadership, personal growth and career success” (National FFA Organization, 2008, p. 5). If agriculture teachers seek to effectively develop leadership in others, they must first identify and understand their personal leadership styles (Bass & Avolio, 2004). The teacher’s leadership, whether it be effective or ineffective, will significantly impact students, agriculture program, school, and community.

Studies are needed to examine and describe the behaviors and characteristics of the agriculture teachers who teach in quality agriculture programs. "Understanding the leadership of the agriculture teacher(s) who run(s) a quality program would provide valuable information for the profession" (Hall, Briers, & Dooley, 2009, p. 40). Furthermore, Greiman (2009) suggests that "qualitative research would be helpful to examine the voice of followers and how the leadership style of adults and peers impacted their leadership development" (p. 59). The need for research examining the leadership style of agriculture teachers is clear; selecting an appropriate leadership theory or model can provide a framework and starting point to discover an effective leadership style for agriculture teachers.

The profession has not adopted a particular leadership model or approach for those seeking to enhance their leadership effectiveness as agricultural educators (Hall, Briers, & Rosser, 2009). However, several key points explained below support the logic of selecting transformational leadership described by Bass and Avolio (1994) as an appropriate model for secondary agricultural educators.

First, the transformational leadership approach has been one of the most widely researched and utilized theories in leadership situations. A content analysis in *Leadership Quarterly* by Lowe and Gardner (2001) suggested that one third of the research was about transformational or charismatic leadership. Second, over the past 25 years leaders in military, government, education, manufacturing, high technology, church, correctional, hospital, and volunteer organizations have been studied through the lens of transformational leadership and were reliably differentiated as leaders ranging from highly effective to ineffective (Bass & Avolio, 2004). An additional point made by Boyd (2009) should appeal to those in education:

> using transformational leadership theory as a pedagogical method and teaching philosophy will not only help students operationalize the theory, but will also lead to deeper understanding for students– a transformation of their understanding of themselves as leaders and leadership itself. (p. 51)

Finally, research specific to our profession by Greiman, Addington, Larson, and Olander (2007) suggested that transformational leadership might be advantageous when confronted with issues in the school environment. Their 2007 study utilized the Multifactor Leadership Questionnaire (MLQ) and concluded that agricultural educators are “more transformational in their preferred style in contrast to transactional and laissez–faire styles” (p. 93). Roberts and Dyer (2004) studied an expert panel of agricultural educators in Florida to identify the characteristics of an effective agriculture teacher. One hundred percent of the respondents agreed that an effective agriculture teacher demonstrates personal qualities such as “cares for students, is honest, moral, and ethical” (p. 89). Each of these qualities aligns with the transformational leadership approach; therefore, this approach will be used to examine the leadership style of the agriculture teachers in this study.

The transformational leadership theory explains leadership as a continuum consisting of transformational and transactional factors and a laissez-faire factor. According to Bass and Avolio (1990), transactional leadership results in expected outcomes whereas transformational leadership results in performance beyond expectations. Therefore, this study will focus solely on the four transformational factors.

Transformational Factors

Factor one, *idealized influence* or *charisma,* describes a leader who acts as a strong role model with high morals; followers count on them to “do the right thing” (Bass & Avolio, 1994 p. 3). Factor two, *inspirational motivation,* describes a leader who communicates high expectations and motivates followers to commit to a shared vision, ultimately inspiring a high level of team spirit. Factor three, *intellectual stimulation,* is evident in leaders who encourage followers to be creative, innovative, and willing to challenge personal as well as organizational beliefs; the leader supports followers as they try new approaches to deal with issues and solve problems within the organization. Factor four, *individualized consideration,* consists of a supportive climate in which the leader listens attentively to individual follower needs, advising and coaching the follower toward self actualization (Bass & Avolio).

Purpose of the Study

The purpose of this case study was to examine the leadership styles of agriculture teachers in a high quality secondary agriculture program. The study sought to determine if the leadership styles of the agriculture teachers align with the four factors of the transformational leadership approach (Bass & Avolio, 1994) as perceived by those closely associated with the agriculture program.

Methods/Procedures

Case study research was used to examine the quality of a secondary agricultural education program. "A case study is an in-depth description and analysis of a bounded system" (Merriam, 2009, p. 40). The principal researcher's experience as a secondary agricultural educator and current work with agriculture programs created a mental model of what constitutes program quality. Then, in this study of one program and its teachers, a holistic picture of the program was gained through semi-structured interviews with 15 participants (Merriam, 2009), all of whom had different but close associations with the program. Participants were interviewed separately/individually to help ensure confidentiality and to encourage honest, detailed responses. The interviews were audio recorded; additional data were collected through observational field notes that included photographs onsite.

Prior to conducting the interviews, the researcher used pilot interviews with several agricultural educators to eliminate confusing questions and to elicit suggestions for additional questions (Merriam, 2009). Additional qualitative methods included observations of the agriculture teachers as they carried out various roles within the program.

Data Collection

The purposive sample for this case consisted of the two agriculture teachers and 13 other individuals associated with the selected secondary agricultural education program; they were purposely chosen to create a holistic representation of the agriculture program. The agriculture teachers were asked to identify possible participants: former students who had graduated from the program, parents of current and former students, faculty and staff from the school, and community leaders. A list of the respondents depicting their connections to the agriculture program is shown in Table 1. In order to protect the identity of each participant, pseudonyms were given; pseudonyms provide an audit trail of each individual's responses and bring the case study to life. The program was selected purposively based on the following criteria:

a) The agriculture program/FFA chapter was recognized as a "high quality" program by the researcher and a panel of agricultural education experts.
b) The agriculture teachers were recognized as outstanding leaders and effective teachers by the researcher and a panel of agricultural education experts.
c) The school was located in the southeastern United States where the researcher taught agriculture and believed that that connection would foster greater rapport with participants.

Table 1

Participant List

Respondent Pseudonym	Title/Connection to Program
Sue	Parent/ FFA Alumni President
Mrs. Carter	Science Teacher
David	Parent/ FFA Alumni/Former Student
Mr. Wright	Principal/Parent of Current Student
Larry	Former Student/ Valedictorian
Jeff	Former Middle School Agriculture Teacher
Mrs. Fields	School Secretary/ Parent of Former Student
Barry	Community Leader/ Former Student/ State FFA President
Meghan	Former Student
Gary	Parent/ FFA Alumni
Lucie	Parent/ FFA Alumni
Mrs. Williams	Guidance Counselor
Ms. Hansen	Agriculture Student Teacher
Mr. Adams	Agriculture Teacher
Mr. Oliver	Agriculture Teacher

Data Analysis and Trustworthiness Measures

The qualitative data were analyzed using "the process of breaking down, examining, comparing, conceptualizing, and categorizing data" (Stauss & Corbin, 1990, p. 61). Semi-structured interviews were audio recorded and field notes were taken throughout the observation and interviewing process. To enhance the credibility of the study, several strategies were utilized by the investigator: triangulation, peer examination, and the clarification of researcher's biases (Merriam, 2009). Triangulation was accomplished through gathering data from a variety of participants and through direct observation by the researcher. "Triangulation using multiple sources of data means comparing and cross-checking data collected through observations at different times or in different places, or interview data collected from people with different perspectives" (Merriam, 2009, p. 216). Peer examinations took place in several meetings with experts who made comments on audio recordings and themes that emerged. The researcher's background and perspectives related to the study were cataloged in a methodological and reflexive journal. All coded data were traced back to the transcripts with an audit trail (i.e., Table 2). Results are presented with representative quotes to give voice to the respondents and provide thick description so that readers can vicariously determine if the results from this case will transfer to their contexts.

Results/Findings

The Context

The selected secondary agricultural education program is located in the southeastern United States in a town with about 7,000 residents. According to the city's chamber of commerce, residents are employed in a variety of industries: health care and social assistance (18%), educational services (11%), retail trade (10%), construction (8%), and agriculture, forestry, fishing, and hunting (8%); the ethnicity of the city comprises 68% White/Caucasian, 28% Black, and 4% Hispanic (Chamber of Commerce, 2009).

There was one high school in the town; there were about 675 students in the high school with about 180 enrolled in the agriculture program. The agriculture program had two agriculture teachers with combined experience of more than 50 years in the classroom. The eight agriculture courses offered were Agriscience Foundations 1, Animal Science and Services 2, 3, & 4, Introductory Horticulture 2, Horticultural Science 3, and Agricultural Sales and Services 2 & 3.

Participants in the study were associated with the agriculture program in multiple ways. Spending time at the school allowed the researcher to observe that the school, community, and agriculture program were interrelated and connected in numerous ways. Students, parents, teachers, and community leaders were connected on multiple levels both personally and professionally. For example, one school employee grew up in the community, knew one agriculture teacher as a family friend, and had a child go through the agriculture program (personal); however, now they are colleagues and work together at the school (professional).

Attention was brought to the interconnected, personal, and professional relationships that exist in this case because throughout the results there was an overlapping and connectedness of themes. The results should be considered from the multiple perspectives in which they were shared. In addition, there is an inextricable bond between the agriculture program and the agriculture teachers. However, this study seeks to focus specifically on the agriculture teachers.

Leadership styles of the agriculture teachers were assessed as perceived by their former students, school faculty and staff, parents of current students, community leaders, and the agriculture teachers themselves. The transformational leadership theory provided a theoretical framework to examine the leadership of the agriculture teachers in the selected program. The four transformational factors—*Idealized Influence, Inspirational Motivation, Intellectual Stimulation,* and *Individualized Consideration*—provided a starting point for the semi-structured questions. Through interviews and observations, several themes and subthemes emerged within each of the four factors; each of the themes and subthemes is explained in relation to the respective transformational factors.

Idealized Influence

Participants described the level at which the agriculture teachers are looked up to and respected by students and others associated with the agriculture program. Three themes: 1) well-respected, 2) family figure, 3) role model, and one subtheme, character, emerged to describe the *idealized influence* of the agriculture teachers.

Numerous comments were made illustrating the level of respect the agriculture teachers have in the school and community. Ms. Hansen, the student teacher interning at the school, spoke of how parents and members of the community see the agriculture teachers; often their comments were, "These are the best guys ever." Ms. Hansen further explained her perspective, "I have never heard anybody say anything bad about them [Mr. Adams and Mr. Oliver]." A former student, Larry, spoke of this respect as well; he stated, "It is probably the highest that teachers could receive…my personal respect for them is…I respect them as teachers, I respect them as men." Another comment regarding the respect of the agriculture teachers was shared by Jeff, the former middle school agriculture teacher, "Well, they think Mr. Adams walks on water; I don't know if I need to say more than that."

Idealized influence was evident through comments that depicted the agriculture teachers almost as members of the family. A community leader and former student, Barry, believes

> there's a lot of people that you'd interview that look to Mr. Adams as a father figure, somebody they could entrust… they would talk to him about some things they wouldn't talk to anybody else about, his advice and the character that he upholds everyday in the community is the reason for that and I don't think Mr. Oliver is any different….he has instilled some of those same values.

Larry shared about a friend of his in school who had a rough home life and shared how important the agriculture teachers were for her. "[Mr. Adams] took the father figure role that was void for most of her life and she definitely got extremely close to [Mr. Adams] as well as [Mr. Oliver]."

In addition to being well-respected/family figures, the agriculture teachers were viewed as role models with solid character. Jeff mentioned, "Parents want their kids to have [Mr. Adams and Mr. Oliver] because they do provide such a good role model." Mr. Wright, the high school principal and father of a student in the program, stated, " They [Mr. Adams and Mr. Oliver] are both positive people… the kids really do pay attention to what they say and they [students] take a lot of it to heart." David, an FFA alumni member and former student, was confident that the agriculture teachers have an influence on students and serve as role models. "I definitely think they [students] look up to them and respect them and you know, try to act like them."

The well-respected, family figure, role model was a deliberate and intentional behavior that both agriculture teachers sought to portray. When asked about being someone who is looked up to, Mr. Adams said, "Well, that is something that I have always taken kinda personally, because I think we are role models… all teachers should be role models." He explained, "I think ag teachers are in a unique position to do that because of the relationship that most ag teachers have with their students…. we need to set examples of what is right and what is wrong." The other agriculture teacher, Mr. Oliver, believes, "It's kinda like taking an oath of morals and ethics and living up to it, not just from 8-5…you have to accept a higher level of responsibility." Mr. Oliver concluded, "We [Mr. Adams and Mr. Oliver] take it very seriously, it's not just a job; it's a life."

Inspirational Motivation

Another factor of transformational leadership is *inspirational motivation*. Through interviews and observations specific ways the agriculture teachers motivate students became evident. Four themes, 1) lead by example, 2) the program, 3) developing students' self-esteem, and 4) high expectations, surfaced to show the *inspirational motivation* provided by the agriculture teachers.

Participants described ways the agriculture teachers motivate students through behaviors themed as "lead by example." David spoke of how "their general attitude" motivated students, [Mr. Adams and Mr. Oliver] act like they are genuinely interested in the kids doing good and learning and doing their best." Individuals shared examples illustrating *inspirational motivation;* numerous words were used to show that the example they set motivated others. The "dedication" (Mr. Wright), "encouragement" (Mrs. Fields), "enthusiasm" (Lucie) and "love" (David) for the kids and the program represent the way in which the teachers "lead by example" (Larry and Mrs. Carter).

The program itself serves as a strong motivator. Individuals stated that competitions offered through the agriculture program, the success of the program, and the traditions associated with the program provided a source for the teachers to encourage and push students to do their best. Mr. Wright believes, "One of the things they [Mr. Adams and Mr. Oliver] use to motivate them [students] is past success; obviously you have a program that has a long history of success…in a lot of ways the tradition in itself is a motivator." The guidance counselor, Mrs. Williams, said, "The plaques on the wall, the trophies in the case, their [students] pictures in the paper" challenge students to do well. Sue, a parent and FFA alumni president, spoke of using competitions to challenge students, "Well, [FFA] competitions are a great thing, some of your student are very competitive."

In addition to leading by example and using the program to motivate students, the agriculture teachers develop the students' self-esteem which creates an environment of *inspirational motivation*. Jeff illustrated how one of the agriculture teachers motivates students who may not have the confidence or courage to participate in a competition or activity.

> I think Mr. Oliver does a great job with that because he has taken kids that say "oh I don't want to do this, I don't care about that, I'm not interested in this," but what he does is challenges them to just try it… a lot of times they will do that and they find out they enjoy it… then they become successful at whatever they are doing.

Even though program is very competitive, the teachers "make sure that they [students] feel good about themselves and their success" (Sue). Meghan, a former student, said, "They just make you feel like you needed to do your best."

The high expectation of the agriculture teachers was a final theme that emerged reflecting the *inspirational motivation*. Larry shared from his experience as a student, **"**They had a standard of excellence that they expected you to reach and it was high, but it was not so high that it was unattainable." Jeff believes that the teachers' high expectations motivate students to do their best and it attracts the higher achieving students to the program, "We have had the valedictorians and salutatorians and I think it's because they expect the best from these kids."

Intellectual Stimulation

Another key factor of transformational leadership is *intellectual stimulation*. Through the study several themes and subthemes appeared to illustrate ways the agriculture teachers challenge students to do their best and to think critically. The three themes that support *intellectual stimulation* are 1) FFA events, 2) good teaching skills with hands-on activities as a subtheme, and 3) challenge students with higher-order thinking as a subtheme.

The agriculture teachers encourage and support student planning and participation in FFA events and activities like the FFA banquet and Career Development Events (CDE) (Lucie). Sue shared one benefit of allowing students opportunities through FFA, "The FFA offers plenty of contests that critical thinking skills are involved." The FFA events the students participate in benefit them beyond high school, Mrs. Williams said, "Students come back and tell me FFA prepared them for college more than some of the purely academic classes they were taking [in high school]."

The good teaching skills of the agriculture teachers were voiced by several individuals. Sue stated, "He [Mr. Adams] just has good teaching skills, he is an excellent teacher." The student teacher, Ms. Hansen, believes, "They [Mr. Adams and Mr. Oliver] model what it means to be a good agriculture teacher." Participants shared several reasons they felt the agriculture teachers exemplify *intellectual stimulation.* Individuals spoke of how the teachers did a great job of connecting multiple subjects and topics from multiple classes. Mr. Adams and Mr. Oliver "teach math and science and make them use it in a way that is meaningful" (Mrs. Williams). In Mrs. Carter's science class students often said, "We talked about that down in ag" (Mrs. Carter). When Mrs. Carter, a science teacher comes by to visit the agriculture building she doesn't expect them to be studying out of books, even though she knows they do, she mentioned, "I expect them to be doing all kinds of hands-on things" working in the greenhouse or on a piece of equipment. Mrs. Carter also spoke of the education value of hands-on activities, "they [students] like that …and they remember it [the material being taught] because it's a practical application."

The agriculture teachers challenge students to think for themselves and question what they believe which leads to higher-order thinking. Jeff mentioned the agriculture teachers set high expectations to motivate students, the *intellectual stimulation* is evident as the teachers "challenge them with difficult things...they make the kids work for it." The principal, Mr. Wright, said he observed Mr. Adams in class the other day and he got kids to think, "Why would you do it that way?" Ms. Hansen put it this way, "They do a really good job of asking a lot of those quadrant four type questions; just going beyond basic recall…they play devil's advocate, making them more of what the other side's argument is."

Individualized Consideration

Another factor associated with transformational leadership is *individualized consideration*. Participants spoke of how the agriculture teachers show students that they care about them. The three themes associated with *individualized consideration* are 1) genuine interests/selfless behavior, 2) involved in students' lives, which has two subthemes, nicknames and relationships, and 3) coaching/advising, with two additional subthemes, student potential and discipline.

The genuine interests and selfless behavior exhibited by the agriculture teachers was expressed by Mr. Wright, "They [Mr. Adams and Mr. Oliver] are always giving of themselves…not many teachers would put in the extra time." They "genuinely have an interest in students" (Sue) so the "extra hours that they do for practice with their teams, going to competitions or what have you on the weekends" (Mr. Wright) is all part of their "dedication" to the students and the program. The agriculture teachers expressed as teachers, genuine interest in students should be expected of them. Mr. Oliver believes that "what we are all supposed to be doing is taking a interest in the personal student." Mr. Adams shared his desire that students know the agriculture teachers care. "They need to know that somebody cares about them. This may be the only place on earth that they know somebody cares about 'em. I do care about our kids…I try to convey that to them."

The genuine interest and selfless behavior is the beginning of being involved in students' lives. Individuals spoke of how the agriculture teachers are "a part of their [students] lives" (Sue) and how students share all aspects of their lives with them even if it does not relate directly to the agriculture program. Mrs. Carter mentioned how the agriculture teachers are

> involved in all the things they [students] do…involved in their lives more so than just, well I see you for 50 minutes and you can go on and I'll see you tomorrow for 50 minutes…the program is more involved than just the 50 minutes classroom.

The agriculture teachers are "keeping up with what they [students] do in their lives outside the classroom" (Mrs. Carter). If the students go on trips with church, sports, band, or other groups they will call the agriculture teachers to let them know they arrived safely.

As a result of being so involved in their students' lives, nicknames and strong relationships have formed. Mrs. Fields shared, "If he [Mr. Adams] likes you and he sees there is something there he can get out of you, he always has a nickname for the student." The close relationship between teachers and the students was shared by Gary, "Mr. Adams kinda jokes with our son" in a friendly manner. Evidence of the teachers being somewhat like a friend was also shared by Lucie, who said, "Spending so much time with them [Mr. Adams and Mr. Oliver], there is a camaraderie there." Mrs. Williams believes that the relationships the agriculture teachers develop with their students are very important. Over time "that relationship is built up and on a number of occasions made a difference in a kid's life."

Individualized consideration was illustrated by the time the agriculture teachers spent coaching/advising students. The agriculture teachers were willing to listen to and help students with anything and everything they were going through in life. Meghan shared of challenges she faced and the advising she received, "I always had confidence issues and whenever Mr. Oliver would see that I was really having a tough time with something he would say, hey you need to talk? We'd talk…he has always been there for us." Looking to develop students' potential and discipline are aspects of coaching/advising that surfaced. Larry said the agriculture teachers have "the leadership ability to recognize some strong traits in some of the students and like help them develop." Meghan recalls, "Becoming a part of the agriculture program, the teachers' outlook was "How can we help you further yourself?" Bringing out the best in students required the teachers to discipline students as well. Lucie shared how that influenced her daughter, "she does not want to be seen in a bad light by him, times when she has kinda screwed up, kids stuff, she has not wanted it pointed out or in detail to Mr. Adams." Mrs. Williams also shared about the teachers' discipline,

> He [Mr. Adams] will have to come down on a kid hard and that kid leaves the meeting knowing that he has been fussed at, but he also knows the he is loved too… they don't tolerate a lot of fooling around, but they still maintain a sense of fun and they still convince the kids they are in it for them.

A summary of the transformational leadership factors with supporting themes and the source of each theme are provided in Table 2.

Table 2

Audit Trail of Transformational Factors with Supporting Themes

Themes and subthemes	Source of themes and subthemes
Idealized Influence	
Well-respected	Sue, Mrs. Carter, David, Mr. Wright, Larry, Jeff, Mrs. Fields, Meghan, Mrs. Williams, Ms. Hansen
Role model	Sue, Mrs. Carter, David, Mr. Wright, Larry, Jeff, Barry, Meghan, Mr. Adams, Mr. Oliver
Character	Mrs. Carter, Barry, Ms. Hansen, Mr. Adams, Mr. Oliver
Family figure	Sue, Mr. Wright, Larry, Mrs. Field, Barry, Meghan, Gary, Lucie, Ms. Hansen, Mr. Adams
Inspirational Motivation	
Lead by example	Mrs. Carter, David, Mr. Wright, Larry, Barry, Mr. Adams, Mr. Oliver
The program	Sue, Mr. Wright, Mrs. Fields, Mrs. Williams, Mr. Adams
Developing students' self-esteem	Sue, Jeff, Meghan, Mrs. Williams, Ms. Hansen, Mr. Adams, Mr. Oliver
High expectations	Mrs. Carter, David, Mr. Wright, Larry, Jeff, Mrs. Fileds, Mr. Adams, Mr. Oliver
Intellectual Stimulation	
FFA events	Sue, David, Jeff, Mrs. Fields, Barry, Gary, Lucie, Ms. Hansen, Mr. Adams, Mr. Oliver
Good teaching skills	Sue, Mr. Wright, Larry, Jeff, Mrs. Fields, Barry, Meghan, Gary, Lucie, Mrs. Williams, Ms. Hansen, Mr. Adams, Mr. Oliver
Hands-on activities	Sue, Mrs. Carter, Larry, Barry, Meghan, Mr. Adams, Mr. Oliver
Challenge Students	Sue, Mr. Wright, Larry, Jeff, Mrs. Fields, Meghan, Gary, Lucie, Mrs. Williams, Ms. Hansen, Mr. Adams, Mr. Oliver
Higher-order thinking	Sue, Mr. Wright, Larry, Jeff, Mrs. Fields, Meghan, Gary, Lucie, Mrs. Williams, Ms. Hansen, Mr. Adams, Mr. Oliver

Individualized Consideration	
Genuine interest/ selfless behavior	Sue, David, Mr. Wright, Mrs. Fields, Meghan, Mrs. Williams, Ms. Hansen, Mr. Adams, Mr. Oliver
Involved in students' lives	Sue, Mrs. Carter, Jeff, Mr. Adams, Mr. Oliver
Relationships	Larry, Mrs. Fields, Barry, Meghan, Gary, Lucie, Mrs. Williams, Mr. Adams, Mr. Oliver
Nicknames	Mrs. Fields, Gary, Lucie, Mr. Adams
Coaching/advising	Larry, Jeff, Mrs. Fields, Barry, Meghan, Gary, Lucie, Mrs. Williams, Ms. Hansen, Mr. Adams, Mr. Oliver
Student potential	David, Mr. Wright, Larry, Mrs. Fields, Barry, Meghan, Mrs. Williams, Ms. Hansen, Mr. Adams, Mr. Oliver
Discipline	Mrs. Carter, David, Mr. Wright, Gary, Lucie, Mrs. Williams, Ms. Hansen, Mr. Adams, Mr. Oliver

Conclusions, Implications, and Recommendations

All of the individuals who participated in the case study shared the perspective that both of the agriculture teachers exhibited each of the four factors associated with transformational leadership. In addition, those associated with the program believe that the agriculture teachers have a strong influence on the quality of the program, the students, and the community. They believe that the leadership of the agriculture teachers is the key component to the success of the program. "There is no doubt that the leader of the program makes all the difference in the world" (Barry).

As a result of this study it is evident that the transformational leadership style of the agriculture teachers was a very positive and effective way to lead. Their impact on the students, agriculture program, school, and community has created a very significant impact that was greatly appreciated by those in the study. This study supports the previous study of Minnesota agriculture teachers claiming transformational leadership may be "advantageous" in the school environment (Greiman, et. al., 2007). In both quantitative and qualitative studies the transformational leadership approach seems to provide a resourceful leadership model for secondary agriculture teachers. However, the effectiveness of other leadership styles is unknown

Additional studies should be conducted not only in individual states, but also on a national scale. Agricultural education is community based; therefore, it would be helpful to see if the transformational leadership approach can help agricultural educators create and sustain high quality programs in all parts of the country. National studies should consider the demographic and programmatic variables associated with the agriculture teacher(s) and their program(s). Then, one could determine if the transformational style of agriculture teachers has any correlation with variables that can be changed or added to create a higher quality agriculture program. Future studies should also consider other leadership models (i.e., authentic leadership, situational leadership, etc.) to determine if other models can help agricultural educators lead more effectively.

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Self-Perceived Leadership Development Factors of Former Arizona State FFA Officers

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Abstract

The purpose of this study was to determine the self-perceived factors that influenced the leadership development of former Arizona State FFA Officers. The objectives were to (1) determine the relevant demographic information of Arizona State FFA Officers from 2009 to 2010 and (2) identify the self-perceived factors within the constructs; agricultural education program, FFA, community, self, family, and school, deemed most influential to former Arizona State FFA Officer's leadership development. In this pilot test the 2009-2010 State FFA Officers (N=11) were administered a researcher developed survey to measure their leadership development within the constructs; agricultural education program, FFA, family, school, community, and self. The FFA and family were found to be the most influential constructs. The most influential individual factors were goals, state FFA leadership activities, experiences with other FFA leaders, and simply being an FFA member. Recommendations include agricultural education teachers encouraging their students to participate in FFA activities, involving families in the program, conducting home visits, and helping students set goals.

Introduction

It is the mission of agricultural education to "prepare students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber, and natural resources systems" (The National Council on Agricultural Education, 2009). The challenge of this statement lies in the question; how do educators prepare high school students with the leadership skills that will be demanded of them by their future employers? Some have proposed that since its inception, leadership development has always been a goal and product of the total program of agricultural education (Brannon, Holley, and Key 1989). Others counter that the most of a student's leadership development occurs primarily in the FFA component (Wingenbach and Kahler, 1997; Dormody and Seevers, 1994; Carter and Spotanski, 1989; Ricketts and Newcomb, 1984; Townsend and Carter, 1983).

Townsend and Carter (1983) found when studying the correlation between participation in FFA activities and development of leadership, citizenship, and cooperation, there was a significant positive relationship between the leadership trait and FFA participation. Ricketts and Newcomb (1984) came to a similar conclusion in their study on senior males who were members of superior FFA chapters, non-superior FFA chapters, and students never enrolled in vocational agriculture programs. The pair found that activeness in the FFA at the chapter level had a high correlation with both leadership and personal development abilities. Two similar studies were conducted by Dormody and Seevers (1994) and Wingenbach and Kahler (1997) on the correlation between FFA involvement and youth leadership life skills development. In

Arizona, Colorado, and New Mexico it was found that there was a weak but positive relationship between participation in FFA activities and youth leadership life skills development (Dormody and Seevers, 1994). In Iowa, Wingenbach and Kahler (1997) concluded that agricultural education students could increase their leadership skills by participating in a variety of youth leadership organizations along with FFA. Additionally Carter and Spotanski (1989) stated that "students who have served as a committee chair, officer, or have received formal leadership training, consistently rated higher the students without these leadership experiences" on a leadership trait instrument. Lastly, Ricketts and Rudd (2004) studied twenty five years of former Florida FFA State Officers and found that the agricultural education program and the FFA were reported to be the most influential factors in leadership development.

"Leadership is leaders inducing followers to act for certain goals that represent the values and the motivations – the wants and needs, the aspirations and expectations – of both leaders and followers… the genius of leadership lies in the manner in which leaders see and act on their own and their followers values and motivations" (MacGregor Burns, 1978, p.13). According to Kouzes and Posner (2002), leaders make a habit of engaging in five practices: modeling the way, inspiring a shared vision, challenging the process, enabling others to act, and encouraging the heart. Researchers argue that leadership is not solely based on personality or born ability but instead is obtained through practice (Kouzes and Posner, 2002). According to Phillips (1992), there is no recipe to follow or pre-prescribed path to leadership, "there are only guidelines and concepts, perceptions and ideas, abstractions and generalities". Researchers advise that in order to understand the steps to developing leadership ability we study individuals who have demonstrated their abilities with concrete results. As Phillips said "for it is only by examining individuals… that we can ever hope to understand how effective leadership works" (1992).

Agricultural education and the FFA have been shown to develop the leadership abilities of students yet so many youth still fail to acquire leadership skills when exposed to these opportunities. While all adolescents have the ability to develop leadership skills (vanLinden & Fertman, 1998), only some agricultural education students take advantage of the opportunity to develop their abilities and become exceptional leaders. In tune with Phillips (1992), by examining the leadership development of individuals who have demonstrated their abilities we may be able to develop curriculum better suited to develop the leadership potential of all students.

Each year the Arizona Association FFA elects a minimum of six and maximum of eleven individuals to serve as State FFA Officers. It is the role of a state officer "to serve the Arizona Association FFA in local, district, state, and national activities in a way that will inform, motivate and inspire FFA members, advisors, state staff, teachers and others to achieve the mission, strategies and core goals of the organization" (Arizona Association FFA, 2008). State officers are selected for their leadership, responsibility, problem solving, and teamwork abilities. The elected individuals stand out amongst the 6,135 members of Arizona FFA and it is reasonable to assume that they are exceptional leaders. It is logical to suppose that if one could identify the factors leading to their leadership development than these same factors could be considered when attempting to develop the leadership potential of all students in agricultural education.

Theoretical Framework

The theoretical framework for this study is based on the conceptualization of youth leadership developed by vanLinden and Fertman (1998). Their conceptualization is based upon two assumptions; that all adolescents have the potential for leadership and that adults can have a positive influence on youth leadership development. They break down youth leadership development into three stages; awareness, interaction, and mastery. Each stage is further broken down into five dimensions; leadership information, leadership attitude, communication, decision making, and stress management. It is their belief that youth develop leadership skills through leadership interactions in the form of people, activities, and learning experiences which occur within the family, the community, school, and work.

The theories that all adolescents have leadership potential and that adults can have a positive influence on youth leadership development are the foundation for this study. It brings about the questions; if all students have the potential to develop leadership then why don't they? And in what ways did adults in the agricultural education program, FFA, school, home, and community effect the leadership development of former Arizona State FFA Officers? To gain a better understanding of what needs to be included in the leadership training of students in the agricultural education program; this study seeks an answer to the following question: What factors actually contributed to the leadership development of former State FFA Officers in Arizona?

Purpose and Objectives

The purpose of this study was to determine the self-perceived factors that influenced the leadership development of former Arizona State FFA Officers. The purpose was achieved by establishing the following objectives:

1. To determine the relevant demographic information of Arizona State FFA Officers from 2009 to 2010.
2. To identify the self-perceived factors within the constructs; agricultural education program, FFA, community, self, family, and school, deemed most influential to former Arizona State FFA officer's leadership development.

Methods and Procedures

This study used a descriptive survey research design to assess the self-perceived leadership development factors of former Arizona State FFA Officers. The study was divided into two phases; the first being the pilot study which will be used to create the final instrument that will be administered in phase two. The target population for the pilot study was the 2009-2010 Arizona State FFA Officer team (N=11). The population of the final study will be all former Arizona State FFA officers from the years 1999 to 2009 who completed a full year of service (N≈100). Names and email addresses were obtained for the officers from the Arizona Association FFA records located at the Arizona Department of Education.

The pilot instrument was developed based on the review of literature with the main resource being the instrument utilized by Ricketts and Rudd (2004). A panel of experts consisting of university agricultural education faculty with experience in FFA and leadership development reviewed the draft of the pilot instrument and determined the face and content validity of the instrument. After reviewing suggestions, the instrument was revised and deemed ready for pilot test administration. There are a total of three sections to the questionnaire. Section one was designed to determine the respondents' perceptions of their leadership development factors within six constructs: agricultural education program (6 items), FFA (14 items), school (14 items), community (7 items), family (7items), and self (12 items), using a Likert-type scale ranging from "Very Influential" (5) to "Not Influential" (1). Section two was designed to determine the most influential factors in the leadership development of the respondents' as well as the factors leading to their decision to run for State FFA office. This section utilized two open ended questions. Section three of the instrument was designed to obtain demographic information from the respondents' as well as their current leadership activity involvement and current support level of the FFA. This section consisted of four open ended questions and four selective response questions.

The pilot survey was administered by the Executive Secretary of the Arizona Association FFA. All 11 individuals (100%) in the pilot-study sample responded but only ten (90%) were complete and usable. Descriptive statistics, analysis of variances (ANOVA), and t-test procedures using Statistical Package for the Social Sciences (SPSS) 16.0 were used to analyze the pilot data. Cohen's *d* was used to determine effect size, followed by post hoc analysis using Bonferroni multiple comparisons to pinpoint specific differences and identify relationships that may want to examined further in the main study. The pilot involved a census therefore there will be no need to infer the findings to a larger population. Responses to open ended questions were summarized using content analysis procedures. After analysis of the pilot, a panel of experts will make recommendations as to the final instrument.

Results and Findings

Objective 1. To determine the relevant demographic information of Arizona State FFA officers from 2009 to 2010.

In the sample of ten former Arizona State FFA Officers males represented 50% of the sample and females represented 50% of the sample. The majority (50%) of the respondents reported that they were from suburban areas followed by 20% from urban areas, 20% from rural agricultural areas, and 10% from rural non-agricultural areas. Ten percent of the respondents reported that they are employed in the field of agriculture, 20% in education, and 50% are simply students. All (100%) reported that they still consider themselves supporters of the FFA. Eighty percent reported that they are currently involved in some sort of leadership activity with the most common being the Jacobs-Cline Society, a collegiate agricultural education organization.

Objective 2. To identify the self-perceived factors within the constructs; agricultural education program, FFA, community, self, family, and school, deemed most influential to former Arizona State FFA Officer's leadership development.

Descriptive results of each of the constructs revealed that former State FFA Officers reported that the FFA and family contributed most to their leadership development followed by the agricultural education, self, school, and community constructs. Table 1 represents findings of objective one and includes a weighted total.

In order to get a more specific understanding of the factors that former State FFA Officer perceived led to their leadership development, descriptive statistics were examined on individual items. Table 2 outlines the individual items with the most important variables listed first. The item "The goals I set for myself" was deemed the most important variable contributing to the leadership development. The top four factors were rounded out by "State leadership activities I attended while in the FFA", "My experiences with other FFA leaders", and "Serving as an FFA Officer".

Table 1.

Summated Means for the Constructs Influencing Leadership Development

Construct	**N**	**M**	**SD**	**Number of Items**	**Weighted Total***
FFA	10	56.30	5.376	14	675.6
Family	10	27.40	6.240	7	657.6
Agricultural Education Program	10	23.40	5.621	6	655.2
Self	10	46.00	9.018	12	644
School	10	45.10	14.232	14	541.2
Community	10	18.70	8.274	7	448.8

*Weighted total determined by weighting each construct equally via a lowest common denominator of 24

Table 2.

Individual Items Contributing to Leadership Development

Factor	**N**	**M**	**SD**
The goals I set for myself	10	4.90	.316
State leadership activities I attended in the FFA	10	4.80	.422
My experiences with other FFA leaders	10	4.80	.422
Serving as an FFA officer	9	4.67	.500
Local and district activities I attended in the FFA	10	4.50	.707
National leadership activities I attended in the FFA	10	4.50	.972
My supervised agricultural experience program	10	4.50	.707
Encouragement from my family	10	4.50	.707
Leadership taught outside of ag class/FFA settings	10	4.50	.850
My family's expectations for me	10	4.40	1.075
Peers or friends in the FFA	10	4.30	.675
Simply being an FFA member	10	4.30	.675

My personal desire to lead	10	4.30	1.059
My personality	10	4.30	.675
The support of my family	10	4.30	.949
Encouragement from my agriculture teacher(s)	10	4.20	1.135
My family's view towards leadership	10	4.20	.919
My own self-concept	8	4.13	1.458
My participation in FFA career development events	10	4.10	1.101
The quality of my agriculture teacher(s)	10	4.10	.994
My own knowledge about leadership	10	4.10	1.370
The awards that were available to me in the FFA	10	4.00	1.247
The career goals I had set for myself	10	4.00	1.333
My personal need for achievement	10	4.00	1.247
My involvement in community activities	10	4.00	1.247
Participation in other school activities	10	4.00	1.054
The quality of my communication skills	10	3.90	1.197
My knowledge of the FFA	10	3.80	.789
The quality of my FFA chapter	10	3.80	1.317
Length of time in the FFA	10	3.80	1.317
The quality of my high school agricultural education program	10	3.70	1.252
My academic success	10	3.70	1.703
Family role models	10	3.70	1.418
Peers or friends in my high school	10	3.70	1.160
My involvement in the church or synagogue	8	3.63	1.408
Serving as an officer in other clubs	10	3.60	1.647
Expectations set for me by my agriculture teacher(s)	10	3.50	1.434
The quality of my other teachers besides my ag teacher	10	3.50	1.179
Leadership instruction I received in my agricultural education classes	10	3.40	1.265
My need for affiliation or to be around others	10	3.40	1.265
The community support of our FFA chapter	10	3.40	1.174
My experiences in other school activities	10	3.40	1.265
The attitude my high school had towards leadership	10	3.30	1.418
My family's involvement with the FFA chapter	10	3.20	1.476
The quality of other school organizations besides FFA	10	3.20	1.135
Leadership activities I attended with other school activities	10	3.20	1.229
My involvement in 4-H activities	7	3.14	1.864
My experiences in band	7	3.14	1.773
Serving on an FFA committee	9	3.11	1.691
My need for recognition	10	3.10	1.449
My family's involvement with the school	10	3.10	1.595
My experiences in athletics	10	3.10	1.663
My individual desire to be in charge	10	3.00	1.414
High school administrator support	10	3.00	1.491
The community support of our ag program	10	2.90	1.101
Serving as an FFA committee chair	9	2.89	1.453
My involvement in boy/girl scouts	6	2.83	1.472
Serving as a committee chair in other clubs	8	2.75	1.753

Serving on committees in other clubs	8	2.75	1.669
My involvement in other agricultural organizations	7	2.29	1.890

To further examine the differences in leadership development factors among the 2009-2010 State FFA Officers, ANOVA procedures were used to investigate the relationships between home community type and the factors. T-tests were used to examine the relationship between gender and the factors. Using an alpha level of 0.05, no significant difference was found between the overall constructs when examining home community and gender.

When examining the individual items, the ANOVA procedures revealed significant main effects between home community type and the following items:

- My personal desire to lead ($F(2/6) = 20.07$, $p = 0.002$)
- My individual desire to be in charge ($F(2/6) = 6.744$, $p = 0.029$)
- My academic success ($F(2/6) = 9.529$, $p = 0.014$)
- My participation in FFA CDE's ($F(2/6) = 6.899$, $p = 0.028$)
- Length of time in the FFA ($F(2/6) = 5.590$, $p = 0.043$)
- Expectations set for me by my ag teacher(s) ($F(2/6) = 6.591$, $p = 0.031$)
- Quality of my other teachers, besides my ag teacher ($F(2/6) = 20.077$, $p = 0.002$)
- Serving as a committee chair in other clubs ($F(2/4) = 34.735$, $p = 0.003$)
- Serving on committees in other clubs ($F(2/4) = 28.367$, $p = 0.004$)
- Participation in other school activities ($F(2/6) = 13.667$, $p = 0.006$)
- High school administration support ($F(2/6) = 11.167$, $p = 0.009$)
- High school attitude towards leadership ($F(2/6) = 15.810$, $p = 0.004$)

To assess pairwise differences within each factor, post hoc Bonferroni multiple comparisons using an Alpha level of 0.05 were conducted as a follow up procedure. State officers from urban ($M = 4$, $SD = 1.41$) and suburban areas ($M = 3.6$, $SD = .89$) had stronger feelings than those from rural agricultural areas ($M = 1$, $SD = 0$) that their personal desire to lead influenced their leadership development. Officers from suburban areas ($M = 3.6$, $SD = .89$) also felt that their individual desire to be in charge influenced their leadership development more than officers from rural agricultural areas ($M = 1$, $SD = 0$). Students from suburban areas ($M = 4.8$, $SD = .44$) had stronger feelings about their participation in CDE's than students from rural agricultural areas ($M = 2.5$, $SD = .70$).Likewise urban students ($M = 5$, $SD = 0$) also had stronger feelings about the expectations set for them by their agriculture teacher(s) than rural agricultural students ($M = 2.5$, $SD = .70$). Suburban students ($M = 4$, $SD = .70$) perceived that high school administrative support was more influential than did State officers from rural agricultural areas ($M = 1$, $SD = 0$). Finally, suburban students ($M = 4.2$, $SD = .83$) valued their high school's attitude towards leadership more than rural agricultural students ($M = 1$, $SD = 0$).

Students from suburban ($M = 4.8$, $SD = .44$) areas reported that their academic success had a significantly greater influence on their leadership development than students from urban schools ($M = 1.5$, $SD = .70$). Additionally, State Officers from suburban areas ($M = 4.2$, $SD = .44$) believed that the quality of their other teachers was more influential than students from both urban (M = 2.5, SD = .70) and rural (M = 2, SD = 0) areas. When examining items related to committee work, students from suburban (M = 4.66, SD = .57) areas valued serving as committee chairs in other clubs more than students from both urban (M = 1.5, SD = .70) and rural (M = 1, SD = 0) areas. Similarly, officers from suburban (M = 4.33, SD = .57) areas saw more value in serving on committees in other clubs when it came to leadership development than officers from both urban (M = 1.5, SD = .70) and rural (M = 1, SD = 0) areas. Lastly, suburban officers (M = 4.8, SD = .44) placed more value on participation in school activities than students from urban areas (M = 2.5, SD = .70).

When examining the individual items, the T-test procedures revealed significant main effects between gender and the following items:

- My experiences in other school activities ($t(8) = -2.53$, $p = 0.035$, $d = 0.44$)
- My experiences in athletics ($t(8) = -4.11$, $p = 0.003$, $d = 0.58$))
- My experiences in band ($t(5) = -3.02$, $p = 0.029$, $d = 0.20$)

Female students (M = 4.20, SD = .837) reported that they valued their experiences in other school activities more than male students (M = 2.60, SD = 1.140) when it came to leadership development. Female students (M = 4.40, SD = .548) also placed more value on experiences with athletics than male students (M = 1.80, SD = 1.304). Lastly, female students (M = 4.67, SD = .577) revealed stronger feelings about their experiences in band than male students (M = 2.00, SD = 1.414).

Conclusions and Implications

The participants appeared to be a fairly diverse mix of individuals. There were an equal percentage of both male and female officers. The majority of respondents reported employment having worked in the areas of agriculture and education. The majority were from suburban areas followed by urban and rural agricultural areas with the smallest portion from rural non-agricultural areas. This may allude to a lack of representation in agricultural education and FFA in rural non agricultural areas. Most of the subjects are still involved with leadership activities and still consider themselves supporters of the FFA. The majority are seeking education beyond the high school level.

The FFA was the most influential construct reported by the State FFA Officers as to their leadership development. This construct contained items such as local, district, state and national activities they attended, experiences with other FFA leaders, awards and career development events (CDE's) available through the FFA, the quality of the FFA chapter and advisor, serving as an FFA committee chair, and serving as an FFA officer. The high value placed on the influence of FFA as a tool in the leadership development of students particularly local, district, state and national activities and experiences with other FFA leaders, may support the continued participation in and development of such leadership activities and opportunities to interact with fellow FFA members.

The family construct was the second most influential factor. This included items such as encouragement and support of family members, family member expectations, family role models, the family's attitude towards leadership, and the involvement of the family within the school and community. The high value placed on family, particularly in the areas of family support and encouragement; suggest that involving the family in the agricultural education program as a whole has a positive impact on a student's leadership development.

The agricultural education construct followed in a close third. This area measured the perceived leadership development brought on by factors such as encouragement and expectations of the agricultural education teacher, the quality of the teacher and program as a whole, supervised agricultural experiences (SAE's), and leadership instruction in the classroom. Officers put particularly high influence on SAE which may further highlight the power of this often overlooked component of the agricultural education program.

The self construct came fourth, followed by school, and lastly community which was deemed the least influential component of a student's leadership development. While most community items were deemed low in influence, higher scores were given to leadership in classes other than agriculture and participation in other school activities. This seems to uphold what previous researchers (Wingenbach and Kahler, 1997) have found about the value of participation in a wide variety of activities.

Goals set for oneself was reported to be the most influential individual item in the leadership development of former officers. This was followed by state leadership activities attended in the FFA, experiences with other FFA leaders, serving as an FFA officer, local and district activities in the FFA, national activities in the FFA, the SAE, encouragement from the family, leadership taught outside of agriculture class and FFA, and expectations from the family to round out the top ten. At the opposite end of the spectrum, involvement in other agricultural organizations, serving on committees in other clubs, serving as committee chairs in other clubs, involvement in boy/girl scouts, and serving as an FFA committee chair were the five items ranked least influential to leadership development. This low ranking could be due to no experience, a lack of interest in, or a negative experience with the item.

Though there were no significant differences across the six main constructs when it came to gender and home community type there were some differences in individual items. Students from urban and suburban areas seemed to value their personal desires, CDE's, their agricultural education instructor, high school administration and attitude more in terms of leadership development than rural agricultural students. Suburban students also valued academic success, the quality of other teachers, and experiences in other school organizations more than urban students. The trend may be due to suburban students assigning more of an immediate value to new skills learned through career development events and in the agricultural education classroom. Suburban students may have a closer tie to administration than students in smaller schools and students from larger urban and suburban schools oftentimes have a wider variety of organizations and courses to choose from. Interestingly, females seemed to value other school organizations such as athletics and band more than males. This may be due to greater natural inclination of female adolescents towards social activities (Ricketts, Osborne, & Rudd, 2004)

Recommendations

Based on the findings of this research, the following recommendations are offered:

1. Because of the value placed on the FFA in the leadership development of Arizona State FFA Officers, agricultural education teachers should attempt to encourage all students to participate in FFA activities and provide them with opportunities to interact with other FFA leaders. In addition, teachers should continue to provide students with as many opportunities as possible to attend local, district, state, and national activities and inform them of the awards available to them through the organization.

2. Agricultural education teachers should work to involve the families of students in the agricultural education program in an effort to develop their leadership skills. As indicated in this study, their support and encouragement is highly influential in leadership development. Teachers should use home visits, parent/teacher conferences, and phone calls to inform parents about the leadership opportunities for their students. This would heighten the importance of encouraging and setting expectations for their children. In addition, teachers should encourage parents to volunteer with the local agricultural education program.

3. Seeing the importance placed on the supervised agricultural experience (SAE), teachers should do their best to ensure that every student has an SAE. Teachers should also set a goal to conduct SAE visits for every student in an effort to ensure that student's projects are an education and leadership developing experience.

4. Setting goals for oneself was the top factor indicated in the leadership development of State FFA Officers therefore teachers should provide students with instruction in goal setting. Teachers should encourage students to set attainable yet challenging goals and should provide students with assistance along the way.

5. As a pilot study, this research is limited to the 2009-2010 Arizona State FFA Officers. This study should be continued by taking a census of all Arizona State FFA Officers from the years 1999 to 2009.

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Are Champions Born or Made?
Differences Between Low Performers and High Performers in a Career Development Event

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Abstract

The purpose of this descriptive-correlation study was to describe and identify the differences between high performers and low performers among participants in the Missouri FFA Livestock Evaluation Career Development Event. The variables of interest included: marital status of parents, Free/reduced lunch status, Individual Education Plan (IEP) status, academic grade level, cumulative grade point average, and previous Career Development Event (CDE) experience as factors related to the individual's performance. Characteristics investigated in this study were determined from a review of related literature on student achievement. This research detected differences between the demographic characteristics of the high performing participants and low performing participants including: IEP status, grade level, free/reduced lunch status, grade point average, marital status of guardian(s), previous experience in livestock evaluation, and gender. Recommendations include increased professional development in accommodating all learners, reinforcement of the purpose of CDEs, and an analysis of other CDE areas.

Introduction

The mission of the National FFA Organization is, "FFA makes a positive difference in the lives of students by developing their potential for premier leadership, personal growth and career success through agricultural education" (National FFA Organization, 2009, p. 5). This mission is accomplished through three components of agricultural education: classroom/laboratory instruction, supervised agricultural experience, and the National FFA Organization (National FFA Organization, 2009). The amount of time school-based agriculture teachers dedicate to each of these areas varies by program (Phipps, Osborne, Dyer, and Ball, 2008). Each component, however, is considered to be equally important to the success of students enrolled in agricultural education courses (Phipps, et al., 2008).

Ideally, agricultural education introduces all students to the opportunities provided by the three components of agricultural education and prepares each student for a career in the agriculture industry (National FFA Organization, 2009). Chiasson and Burnett (2001) stated that "agriculture programs educate students to achieve in diverse areas that are very practical for dealing with the challenges in today's world" (p. 62). The end result is a student with enhanced knowledge in agriculture, leadership abilities, and direction toward a chosen career of interest (National FFA Organization, 2009). There are approximately 800,000 students enrolled in more than 100 different agricultural education courses in the United States (National FFA Organization, 2009). As Morgan, Chelewski, Lee, and Wilson (1998) stated, this curriculum is intended to prepare students of all levels and backgrounds for future careers in agriculture and related fields.

Involvement in the National FFA organization is intended to provide real world learning opportunities outside the classroom for all agricultural education students (Talbert & Balschweid, 2005). According to Reis and Kahler (2007), students identified the FFA and Career Development Events (CDEs) offered through FFA to be the most satisfying experiences while they were involved in school-based agricultural education courses. The first CDEs, originally referred to as "evaluation contests," can be traced to state contests for vocational agriculture students held in 1919 (Tenney, 1977). These organized competitions were designed for students to compete using knowledge of specific areas of agriculture attained from instruction. According to the Missouri FFA Career Development Event Handbook (Missouri FFA Association, 2008), CDEs aid and enhance student interest in the agricultural industry. CDEs are designed to, "motivate students to acquire additional knowledge, develop skills and abilities, and stimulate student interest in furthering their education" (Missouri FFA Association, 2008, p. 1). CDEs are also designed to "assess the level of proficiency each student has achieved" in specific subject areas taught in secondary agriculture classroom settings (Missouri FFA Association, 2008, p. 1). As such, CDEs are linked to instruction and relate to all students enrolled in agriculture classes. This assertion suggests that the purpose of CDEs has expanded since their adoption by the National FFA Organization.

Based upon literature, the purpose of agricultural education is to prepare all students for entry into the agriculture industry (Association for Career and Technical Education, 2010; Missouri Department of Elementary and Secondary Education, 2009; National FFA Organization, 2009; Phipps, et al., 2008). If agricultural educators truly believe in its purposes, as defined by these authorities, then it can be assumed that all students, regardless of their individual differences, are provided the opportunity to participate and can find success in these areas of agricultural education, FFA, and CDEs. However, there are varying factors among students that can affect the likelihood of student achievement (U.S. Department of Education, 2009). These varying student demographics can include previous experience in the subject area, parent marital status, low socioeconomic status, and the ability level of the student to learn and apply information (Gohm, Oishi, Darlington, & Diener, 1998; Kopcha & Sullivan, 2008; Okpala, 2002; Rumburger & Palardy, 2005;). According to the National Research Council (2000), it is crucial to student success that teachers address student diversity when providing instruction, allowing all students the opportunity to achieve success inside and outside the classroom.

Research has been conducted to determine diversity among FFA members participating at state and national CDEs (England, 1996; Johnson, 1991; Rayfield, 2006; Rayfield, Fraze, Brashears, & Lawver, 2007). However, research concerning characteristics of students participating at state qualifying CDEs is limited. This study seeks to expand knowledge about the role CDEs have in accomplishing the FFA mission by comparing characteristics of high achieving students and low achieving students participating in state qualifying CDEs.

Theoretical Framework

The theoretical model for this research is derived from the attribution theory of achievement established by Weiner et al. (1971), and is based on causal factors and individual differences. Causal factors for student achievement, identified by Weiner, include students' ability, the level of effort put forth, the difficulty of the task at hand, forms of support, and luck (Schunk, 2004). In most cases, only one or two of these factors are identified as being primarily responsible for the outcome (Weiner et al., 1971). These descriptors can contribute to or restrict the likelihood of student success unless they can be recognized and managed by the student, parent, or teacher (Schunk, 2004).

Weiner et al. (1971) organized causal factors into three causal dimensions. The dimensions and categories for causal factors are: a) internal or external to the student; b) stable or unstable over time; and c) controllable or uncontrollable by the student (Weiner, 1979). Figure 1 displays a conceptualization of this theory.

	Internal		**External**	
	Stable	*Unstable*	*Stable*	*Unstable*
Controllable	Typical effort	Immediate effort	Teacher support	Support from others
Uncontrollable	Ability	Mood	Task difficulty	Luck

Figure 1. Model of Causal Attribution displaying the interactions between the dimensions by Weiner, B., Frieze, I. H., Kukla, A., Reed, L., Rest, S., & Rosenbaum, R. M. (1971). *Perceiving the causes of success and failure,* p. 355.

The framework design in Figure 1 highlights the relationships of attributes commonly possessed by students (Schunk, 2004). The attributes described occur in varying situations and degrees (Schunk, 2004). Various combinations of these attributes can increase or decrease the likelihood of student success (Weiner, 1979). Success is influenced by level of stability perceived by students in internal and external variables but controllability of attributes does not necessarily determine success (Schunk, 2004).

Individual differences, such as previous experiences, sex, parental relationships, and socioeconomic status, are considered to contribute to the success or failure of students (Schunk, 2004). Schunk (2004) stated that previous experiences can play a role in student motivation as well as their level of aspiration. This assertion is congruent with the findings of England (1996), Johnson (1991), Rayfield (2006), and Rayfield, et al. (2007). Sex and student achievement are correlated based on subject area and age of students (Rayfield, 2006; Rayfield, et al., 2007;

Thomas & Stockton, 2003). Sutton and Soderstrom (1999) found an inverse relationship between socioeconomic status and student achievement. Bokhorst, Sumter, and Westenberg (2009) stated that the relationship between parents and 9 to 18 year old youths, or lack thereof, can contribute to student self efficacy. Applied to the agricultural education context, can these causal factors and individual differences contribute to the performance of students in the Livestock Evaluation CDEs?

Purpose/Objectives

The purpose of this study was to determine the demographic characteristics of selected students who participated in the Missouri FFA Livestock Evaluation CDE in 2009. Specifically, this research compared selected characteristics of participants who performed poorly in this activity to those of participants who performed exceptionally well. The following three research objectives and one hypothesis were formulated to accomplish the purpose:

1. What are the selected demographic characteristics (IEP status, cumulative GPA, previous experience in livestock evaluation, free/reduced lunch, guardian marital status, and sex of student) of students who scored among the highest 2.5% at the state finals of the Missouri Livestock Evaluation CDE in 2009?

2. What are the selected demographic characteristics (IEP status, cumulative GPA, previous experience in livestock evaluation, free/reduced lunch, guardian marital status, and sex of student) of the students who scored among the lowest 2.5% (lowest performing) at district Missouri Livestock Evaluation CDEs in 2009?

3. What are the differences between selected demographic characteristics of the highest performing students and lowest performing students in the Missouri Livestock Evaluation CDE in 2009?

Methods/Procedures

This study was a descriptive-correlation research design. The purposive sample was composed of the top and bottom 2.5% of all participating competitors in the 2009 Missouri FFA Livestock Evaluation CDE (n = 32). The lowest performers (LP) were identified based upon scores earned by individuals at each of the six district events, which serve as the qualifying round for the state CDE finals. The highest performers (HP) where identified based upon scored earned by individuals at the state CDE finals. All subjects were identified from official results of district and state CDEs posted on JudgingCard.com. Data were collected from the FFA Advisor each subject selected for the study.

The Missouri FFA Livestock Evaluation CDE is divided into three subject matter areas that contribute to a total possible individual score of 550. Individuals competing in the Missouri FFA Livestock Evaluation CDE (N = 640) in 2009 had a mean score of 423.91 (SD = 41.83). The highest performers group was composed of students who scored 2.00 SD above the mean (n = 16; 2.5%). The lowest performers group was composed of students who scored 2.00 SD below the mean (n = 16; 2.5%). It is evident that differences exist in these students scores. However, it is not assumed that a difference exists in the students characteristics.

The researchers contacted the subjects' FFA Advisors through personal or telephone contact following the state CDE finals. Each Advisor was asked to provide information about 18 characteristics included in this investigation through an interview administered by a single person who served as the data collector. These items were derived through the findings of research addressing factors of achievement among high school students (Johnson, 1991; Rayfield, 2006; Rayfield, et al., 2007). A panel of experts (n = 5), composed of former school-based agriculture teachers and FFA advisors, examined the items for content validity. Because data collection was conducted through interviews, there was no need to establish face validity. Because this study only utilized nominal data, it was unnecessary to conduct a pilot study to establish reliability (Ary, Jacobs, Razavieh, & Sorensen, 2006).

Following the data collection period, data were coded and entered into SPSS for Windows. Descriptive statistics of central tendency and variability were calculated to summarize the data. Independent sample t-tests, Cohen's d, and *phi* correlations were conducted to test differences between the groups, and binary logistic regression was computed to explain the variance in individual characteristics. Effect sizes were calculated and interpreted using Cohen's (1988) d coefficients: negligible effect size ($d < 0.15$, small effect size ($d < 0.40$), medium effect size ($d < 0.75$), large effect size ($d < 1.10$), very large effect size ($d < 1.45$), and huge effect size ($d > 1.45$). Phi effect sizes were calculated and are described as: .10 - .29 = weak, .30 - .49 = moderate, .50 and above = strong (Huck, 2008). An alpha level of .05 was established a priori for tests of significance.

Results/Findings

Objective One

Objective One sought to describe selected demographic characteristics of the students who were among the top 2.5% of participants in the 2009 Missouri Livestock Evaluation CDE. In this group, juniors (n = 7; 43.75%) and seniors (n = 6; 37.50%) outnumbered freshmen (n = 1; 6.25%) and sophomores (n = 2; 12.5%). No students in the HP group had an IEP. Only 1 (6.25%) of the 16 students in this group qualified for free/reduced lunch. None of the subjects had a grade point average (GPA) below a 3.00 on a 4.00 scale. Eight (50%) had a GPA of 3.00 – 3.99 and 6 (37.50%) had a GPA of 4.00 or better. The mean GPA for the HP was 3.72 (n = 14). Marital status of guardian(s) was categorized as either married or single and/or divorced. All but two (n = 14; 87.50%) of the parents of HP were married. More than 40% (n = 7; 43.75%) of the HP had previous evaluating livestock experience. Table 1 shows a summary of these data.

Objective Two

The goal of Objective Two was to describe the selected demographics of the students who were among the lowest 2.5% of the Missouri Livestock Evaluation CDE. The majority of the students in this group were freshmen (n = 10; 62.50%) with the remainder being composed of 2 sophomores (12.50%), 2 juniors (12.50%) and 2 seniors (12.50%). Nearly half the LP subjects were reported to have an IEP (n = 7; 43.75%) with one student having an unknown status. Seven of the LP subjects were reported to receive free/reduced lunch (43.75%) while 5 (31.25%) were reported to not receive free/reduced lunch, and the status of 4 (25.00%) students was unknown. None of the students in the LP category had a GPA of 4.0 or above with two responses being unusable. The mean GPA for students in the LP category was 2.55. The marital status of guardian(s) of LP students was split evenly between the categories of married (50.00%) and single/divorced (50.00%). Only one LP student (6.25%) had previous experience in the Livestock Evaluation CDE. These data are also displayed in Table 1.

Table 1
Characteristics of Highest Performing (HP) Participants and Lowest Performing (LP) Participants in the Missouri Livestock Evaluation CDE (n = 32)

	HP (n = 16)		LP (n = 16)		Total (n = 32)	
Characteristic	*f*	%	*f*	%	*f*	%
Grade						
Freshman	1	6.25	10	62.50	11	34.28
Sophomore	2	12.50	2	12.50	4	12.50
Junior	7	43.75	2	12.50	9	28.13
Senior	6	37.50	2	12.50	8	25.00
GPA						
4.0 and Above	6	37.50	0	0.00	6	18.75
3.0-3.99	8	50.00	6	37.50	14	43.75
2.0-2.99	0	0.00	6	37.50	6	18.75
2.0 and Below	0	0.00	2	12.50	2	6.25
Sex						
Female	3	18.80	5	31.30	8	25.00
Male	13	81.30	11	68.80	24	75.00
IEP Status						
No	16	100.00	8	50.00	24	75.00
Yes	0	0.00	7	43.75	7	21.88
Recipient of Free/Reduced Lunch						
No	15	93.75	7	43.75	22	68.75
Yes	1	6.25	5	31.25	6	18.75
Marital Status of Guardian(s)						
Married	14	87.50	8	50.00	22	68.75
Single and/or Divorced	2	12.50	7	43.75	9	28.13
Previous Experience in Livestock						
No	9	56.25	15	93.75	24	75.00
Yes	7	43.75	1	6.25	8	25.00

Note. HP = Highest Performers; LP = Lowest Performers. Not all responses were useable.

Objective 3

The purpose of Objective Three was to compare differences between HP group and LP group in the Missouri Livestock Evaluation CDE. A *phi* coefficient was utilized to estimate the degree of correlation between the selected demographic variables (IEP status, cumulative GPA, previous experience in the Livestock Evaluation CDE, free/reduced lunch, guardian marital status, and sex of student) and student performance. *Phi* was chosen because the variables are dichotomous and nominal in nature and it is a measure of the degree of association between the variables (Huck, 2008). Pearson product-moment correlation coefficient (r_f) was used for correlation analysis. IEP Status was the only variable that identified a strong effect size (r_f = .56). Variables having moderate effect sizes to contestant achievement included: Previous experience in the Livestock Evaluation CDE (r_f = .43), free/reduced lunch (r_f = .43), and guardian marital status (*rf* = .38). Sex was found to have a weak effect size (*rf* = .14) to student performance in the CDE. See Table 2 for *phi* coefficient values.

Table 2

Comparison of Student Characteristics Between Highest Performers and Lowest Performers in the Missouri FFA Livestock Evaluation CDE (n = 32)

Variable	r_φ	r^2	Effect Size[a]
IEP Status	.56	.31	Strong
Previous Experience	.43	.18	Moderate
Free/Reduced Lunch	.43	.18	Moderate
Guardian Marital Status	.38	.14	Moderate
Sex of Student	.14	.02	Weak

Note. IEP Status coded: With = 0, Without = 1; Previous Experience Coded: Yes = 0, No = 1; Free/Reduced Lunch: Recipient = 0, Non-recipient = 1; Guardian Marital Status: Married = 0, Single/Divorced = 1; Sex of Student: Male = 0, Female = 1.

[a]Phi effect size (Huck, 2008)

An independent (two-tailed) *t*-test detected a difference in the GPA of the HP group (*M* = 3.72; *SD* = .32) and LP group (*M* = 2.55; *SD* = .64). It should be noted that four scores, two from each of the HP and LP categories, were deemed unusable. Cohen's *d* was calculated (*d* = 2.31) and using Cohen's descriptors a "Large" effect size (Cohen, 1988) was noted (see Table 3).

Table 3

Independent Samples T-test for Raw Grade Point Average of Highest Performers versus Lowest Performer (n = 28)

Category	*n*	*M*	*SD*	Cohen's *d*
Highest Performers	14	3.72	0.32	2.31 (Large[a])
Lowest Performers	14	2.55	0.64	

[a]Effect size defined by Cohen (1988)

Conclusions

Results of this study indicate that there are certain demographic characteristics that will portend students' achievement level in the Livestock Evaluation CDE in Missouri. These results are consistent with the findings from several previous studies about FFA member achievement (England, 1996; Johnson, 1991; Rayfield, 2006; Rayfield, et al., 2007). However, the findings of this study contradict results of certain factors affecting student achievement (Thomas & Stockton, 2003; Webster, Young, & Fisher, 1999). A previous study found that males scored higher on the National Livestock Evaluation CDE (Rayfield, 2006; Rayfield, et al., 2007). This study did not find a substantial relationship between sex and achievement.

A profile of highest performers in the 2009 Livestock Evaluation CDE in Missouri can be concluded from these data. Highest performers were predominately upperclassmen with above a B grade point average in school and did not require specialized education services. Their families had two parents in the household and they were not in the lower socioeconomic status bracket as indicated by free/reduced lunch. These students also had previous experience with the Livestock Evaluation CDE.

Similarly, a profile can be constructed of lowest performers in the Missouri Livestock Evaluation CDE. They were underclassmen with a C average GPA. Compared to highest performers, it was more likely that lowest performers required specialized education services. It was more likely that lowest performers qualified for free/reduced lunch, indicating their guardians earned less than $41,000 (Child Nutrition Programs, 2009) per year for a family of four. These students were also more likely to come from a home with a single parent. It is unlikely that lowest achievers had previous experience with the Livestock Evaluation CDE.

Implications/Recommendations

The conclusion of this study regarding the impact of prior livestock evaluation experience correlating to success in Livestock Evaluation CDEs were in agreement with findings by Rayfield (2006), Rayfield, et al. (2007), and England (1996). The influence of sex regarding CDE achievement varies among different studies. Contradictory to previous studies (Thomas & Stockton, 2003; Rayfield, 2006; Rayfield, et al., 2007) sex was not found to have an influence on participant achievement in this research. This finding is, however, in agreement with the findings of England (1996) and Webster, Young and Fisher (1999). Obviously, more research needs to be conducted to investigate the influence of this factor upon achievement in this and other FFA activities.

This study confirms the findings of Thomas and Stockton (2003) stating that socioeconomic status, as measured by status of free/reduced lunch, affects student achievement. Conversely, the conclusion of this study related to socioeconomic status conflicts with the findings of Webster, Young and Fisher (1999). This study suggests individual student differences, including prior experience and socioeconomic status, play a role in student achievement (Weiner et al. 1971; Sutton & Soderstrom, 1999; Schunk, 2004). In future research, the category of free/reduced lunch should be separated into free lunch and reduced lunch as there is a difference in the socioeconomic status categories of the two categories.

In agreement with a study of the relationship in demographic variables and performance in a National FFA CDE by Rayfield, et al. (2007), this study found GPA to have an impact on student performance. The researchers draw caution to comparing these results of these two studies, however. The 2007 study evaluated students at a national CDE, implying that each student was successful at the state level, whereas this study compared students who competed at the district level used to qualify to compete at the state level.

The results of this study suggest that IEP status and previous experience in Livestock Evaluation CDE are associated with student success. The positive aspect of this finding is that both of these factors have a degree of manageability by the agriculture teacher. Considering it is the responsibility of the teacher to meet the educational needs of all students, it is recommended that school-based agriculture teachers be given additional professional development opportunities and training on how to accommodate the specialized needs of diverse learners. If school-based agriculture teachers are able to obtain proper training for working with students with special needs, the accommodations could increase the likelihood of overcoming the dimensions and causal factors that limit the student's success according to Weiner's theory (1971).

Further research is needed to determine the variation of the characteristics investigated in this research between national and state level competitions. For this study, data were collected only on students at the extreme ends of performance in one CDE. Students composing the complete range of performance at such FFA activities should be examined. A study in which data are collected on every student from multiple CDEs would add to the body of knowledge related to the effect of demographic variables on participant performance. Such information would provide another method to evaluate whether or not FFA contribute to the mission of the organization.

Teacher educators and state staff should consider reinforcing the purpose of CDEs, as defined by the National FFA Organization, to all school-based agricultural teachers. It could be argued that results of this study illustrate that a diverse group of students are presented with the opportunity to compete in CDEs. However, the homogeneity of the two groups studied in this investigation, highest performers and lowest performers, indicates that the educational needs of lowest performers are not being met.

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The Introduction (below) contains a list of posters in the proceedings. Use the bookmarks to the left to jump to a specific poster. Bookmarks are in alphabetical order by poster title. To print a specific poster, use the bookmark then print selected pages. To print this page without these instructions choose the Document under Comments and Forms option.

2010 Poster Session Proceedings Omaha, Nebraska

Three calls for posters were made to the AAAE listserve for posters for display at the 2010 meeting in Omaha, Nebraska. The call for posters was also posted on the AAAE website. Submissions to the online site (http://www.agedweb.org/aaae) were accepted between 11/01/2009 and 03/03/2010. One hundred fifteen submissions were received with sixty-four submissions in the innovative idea category and fifty-one in the research category.

Thirty-one reviewers were asked to review 6-9 abstracts each between March 4th and April 1st. Reviewers were assigned posters so as to not review abstracts from their home institution or in the same category in which they may have submitted an abstract. Reviews were completed by April 8th.

Posters were ranked by reviewer mean Z score in each category (research and idea). Acceptance was based on Z score ranking, acceptance recommendation by the reviewers, and the reviewer's comments. Nine posters in each category were accepted as regional winners. Twenty-seven of the reviewed posters were accepted in each category for a total of 36 posters in each category chosen for display*. The acceptance rate for innovative idea posters was 42% and research posters was 53%, for a combined acceptance rate of 46%. Guidelines for the poster session are posted on the AAAE Wiki.

All authors were notified by email on April 10th, 2010. Reviewer scoring and comments were made available to the authors on the web site: www.csuchicoag.org/aaae (reviewer is anonymous).

Posters will be judged at the conference using the guidelines and rubrics established by the Program Improvement Committee (see AAAE Manual: http://aaae.wikispaces.com/National+AAAE).

*Some of the accepted posters were regional winners. The total number of posters actually accepted to the conference is 69.

Poster Reviewers

The following people generously and professionally donated their time to review poster abstracts. Without their commitment the poster session would not be possible.

Anderson, Shawn	Oregon State University
Arnold, Shannon	Montana State
Aschenbrener, Mollie	California State University Chico
Broyles, Thomas	Virginia Tech
Clary, Cynda	New Mexico State University
De Lay, Ann	Cal Poly, SLO
Dodson, Brad	California State University, Chico
Duncan, Dennis	University of Georgia
Edwards, Stephen	Virginia Tech
Ellott, Jack	Texas A&M University
Epler, Cory	Virginia Polytechnic Institute and State University
Falk, Jeremy	The Ohio State University
Foster, Daniel	Penn State University
Harbstreit, Steven	Kansas State University
Harder, Amy	University of Florida
Jones, David	North Carolina State
Kasperbauer, Holly	Virginia Tech
Kieth, Lance	West Texas A&M UNiversity
Lawver, Rebecca	Utah State University
Luft, Vern	University of Nevada
Moore, Donna	Virginia Tech
Morgan, Chris	University of Georgia
Paulsen, Thomas	Iowa State University
Peng, Jiajiang	Purdue University
Rayfield, John	Texas A&M University
Ricketts, John	University of Georgia
Shinn, Glen	Texas A&M University
Spiess, Michael	California State University, Chico
Swan, Michael	Washington State University
Thoron, Andrew	University of Florida
Williams, Kevin	West Texas A&M University

Regional Winners

The following posters were regional winners. Regional winners are automatically accepted for display at the national conference.

North-Central Region

	Title	Author(s)	Institution(s)
Innovative Idea			
1	Professional Development through Winter Technical Institutes: Agricultural Electrification	P. Ryan Saucier & John D. Tummons	University of Missouri
2	Development of an Agricultural Mechanics Course for Pre-service Teachers	Michael Pate, Greg Miller & W. Wade Miller	Iowa State University
3	Jamaica: Dawn of a New Beginning	B. Allen Talbert, Mark A. Balschweid & Daniel Gottschalk	Purdue University, University of Nebraska-Lincoln, Purdue University
Research			
1	FFA Professional Development Needs of Missouri Agricultural Educators	P. Ryan Saucier, John D. Tummons, Leon G. Schumacher, & Robert Terry, Jr.	University of Missouri
2	Development of an Instrument to Measure the Agriscience Education Self-Efficacy of Middle School Students	Levon Esters	Purdue University
3	An Exploratory Study of Students' Oral Presentation Self-Efficacy	Levon Esters	Purdue University

Southern Region

	Title	Author(s)	Institution(s)
Innovative Idea			
1	Recruiting Future Agricultural Education Students into the Teaching Profession: The Development of an AGED CDE	Mandy Jo Campbell; J. Shane Robinson	Oklahoma
2	Transforming Education in Agriculture for a Changing World	R. Kirby Barrick	University of Florida
3	Blogging In The Classroom: Three Pedagogical Approaches To Using Blogs For Reflection	Nicole Stedman, Greg Gifford, Karen Cannon	University of Florida
Research			
1	A Model for Improving Faculty Instruction in Colleges of Agricultural & Environmental Sciences	Diana King	University of Georgia

	Title	Author(s)	Institution(s)
2	Tips from the Trenches: Teaching Advice for Beginning Academics	Kelsey Hall & Courtney Meyers	Texas Tech University
3	Perceptions of Instructional Methods in Biofuel Education of Secondary Students	Clayton Sallee, Don Edgar, Donald Johnson	University of Arkansas

Western Region

	Title	Author(s)	Institution(s)
	Innovative Idea		
1	Enhancing Pre-service Teaching Advising by Adopting a Skills Inventory	Michael Spiess and Mollie Aschenbrener	California State University, Chico
2	Produce Your Own: A Community Gardening Program	JoLynn Miller, Dr. Shannon Arnold	Montana State University
3	Enhancing Career Development Event Preparation Utilizing Jing™ Audio/Video Recordings	Kimberley Miller; Dr. Theresa Pesl Murphrey	Texas A & M/Texas Tech
	Research		
1	Northwest's Supply & Demand for 2009-2010: Who is filling the Ag Teaching Positions?	Ben Swan	University of Idaho
2	Students' new media use as a basis for advancing agricultural communications curricula	Bryan K. Ray, Traci L. Naile, K. Jill Rucker	Texas A&M University, Texas A&M University, Oklahoma State University
3	Improving Undergraduate Curriculum: What do our Alumni Think?	Kori Barr, Erica Irlbeck, Cindy Akers, Courtney Meyers, David Doerfert, & Alyx Shultz	Texas Tech University

Accepted Posters

The following posters were accepted as part of the peer review process for the national AAAE meeting.

Title	Author(s)	Institution(s)
Innovative Idea		
Agricultural Education "Un-Plugged": Using Wireless Slates (WS) during Student Teaching in Agricultural Education	Jon Ramsey	Oklahoma State University
Bringing Experience Into the Classroom Through the Use of Blogs	Wendy Warner, Kathryn Murray, Ann De Lay	North Carolina State University, California Polytechnic State University
Build Me, See Me, Touch Me, Remember Me: Display Boards for Student Teachers	Ed Franklin	University of Arizona
Developing a Diversified Program: The Madison County 4-H Youth Outreach Project	Billy F. Zanolini & Douglas D. LaVergne	Texas A&M University & West Virginia University
Developing a Leadership Assessment Instrument for Cooperating Teachers	Gaea Wimmer, Todd Brashears, Scott Burris	Texas Tech University
Facebook in the Virtual Classroom	Sarah Baughman and Jenna Genson	Virginia Tech
Food for Thought Curriculum: An Innovative, Collaborative Agricultural Literacy Project	Emily Holden, Peg Herring, Shawn M. Anderson, Jonathan J. Velez, Gregory Thompson	Oregon State University
Getting Their Feet Wet: Children's Water Festival Presentations as a Field Experience Component	Kellie Claflin &Tim Buttles	University of Wisconsin - River Falls
How Pre-service Teachers are Preparing to Serve the Deaf in AGED: Opting for American Sign Language (ASL) as a "Foreign Language" to Meet Teacher Certification Requirements in Oklahoma	Dayla Turner, J.C. Bunch, M. Craig Edwards, Jon W. Ramsey	Oklahoma State University
Implementing the Integration of STEM Curriculum in Agricultural Education: Implications for Pre-service Teacher Education	J. Chris Haynes, Jeffrey H. Whisenhunt, J.C. Bunch, M. Craig Edwards, J. Shane Robinson	Oklahoma State University
Improving Facility Evaluation Skills	Benjamin G. Swan, Kattlyn J. Wolf	University of Idaho
Incorporating College Success Tactics Into a Dual Credit Course Curriculum: Coaching Students On How To Enter College Efficiently and Effectively From The First Day	Alanna Neely, Cliff Ricketts and Warren Gill	Middle Tennessee State University
Innovations in Agri-Life Sciences: A Journal for Secondary Academic Excellence	Bryan Hains and Matthew Anderson	University of Kentucky
Integrating Teaching With Technology	Katie Undem and Dr.	Montana State

Title	Author(s)	Institution(s)
	Shannon Arnold	University
Making Learning Meaningful for the Millennials: Podcasting with a Purpose in Agricultural Education	JC Bunch, J. Chris Haynes, Jon W. Ramsey, M. Craig Edwards, Tanner Robertson	Oklahoma State University
Mentoring "quick-starter" graduate students	Karen Cannon	University of Florida
Recruiting by Doing: Utilizing existing undergraduate student organizations to facilitate secondary student recruitment in agricultural teacher education	Ayla R. Detwiler, Daniel D. Foster, John C. Ewing	Pennsylvania State University
Social Media and Small Businesses – Creating Marketing Strategies in the Digital Age	Leslie D. Edgar; Jefferson Miller; Stacey W. McCullough; Kimberly B. Magee	University of Arkansas
SPARK: Lighting up student learning in knowledge translation and transfer	Owen Roberts	University of Guelph
Student Teaching Capstone Expedition	Benjamin G. Swan, James J. Connors, Kattlyn J. Wolf	University of Idaho
The Leadership Spot: A multi-institutional, online approach to leadership education	Heath E. Harding, Andrea Lauren Andrews, Dr. Gregory T. Gifford, Dr. Gina S. Matkin	University of Nebraska-Lincoln, University of Florida
Training the Teachers: An Agricultural Communications Career Development Event Training Workshop	Ashley Palmer, Erica Irlbeck, and Courtney Meyers	Texas Tech University
Transforming leaders through international experiential learning: A synergistic collaboration between nonprofit organizations and academia	Jill Casten & Marty Tatman	Virginia Tech & National FFA Organization
Using concept maps to better understand the discipline of agricultural education	Michael Retallick	Iowa State University
Using Interactive Whiteboards in the Agricultural Education Classroom: How Student Teachers are Using this Technology—Potential Implications for Teacher Educators	JC Bunch, Jeffrey H. Whisenhunt, M. Craig Edwards, J. Shane Robinson, Jon W. Ramsey	Oklahoma State University
Utilizing Virtual Field Trips in Pre-service Teacher Education	Catherine W. Shoulders; Brian E. Myers	University of Florida
Virtual Student Teacher Meeting: Implementing Face-to-Face Reflection at a Distance	Thomas Paulsen	Iowa State University

Research

A Perceptual Analysis Of State Supervisors' Views Towards Inclusion In Secondary Agricultural Education Programs	Chastity Warren English, Antoine J. Alston, Anthony Graham, Dexter Wakefield, Frankie Farbotko	NC A&T State University

Title	Author(s)	Institution(s)
An Analysis of Florida Career and Technical Education Teachers’ Stages of Concern Regarding the Use of Content Area Reading Strategies	Adrienne Gentry, Catherine W. Shoulders, Brian E Myers	University of Florida
An Investigation of the Impact of Student Teaching on Attitudes Toward Teaching Secondary Agriculture	Rebecca G. Lawver, Amy R. Smith, Robert M. Torres	Utah State University, South Dakota State University, University of Missouri
BEEF, It’s What Makes Leaders: Leadership Skills Developed through the Georgia Junior Beef Show Program	Chris Morgan	University of Georgia
Components of Teacher Identity as Indicated by Clinical Faculty	Katherine McKee	Virginia Polytechnic Institute and State University
Culturally Competent Secondary Agriculture Teachers: The Multicultural Awareness-Knowledge-Skill-Attitude Assessment	Stacy Vincent	University of Missouri
Describing The Cognitive Level Of Discourse Of A Secondary Teacher During An Animal Science Unit Of Instruction	Jeremy Falk, Ashley Batts, Dr. Susie Whittington	The Ohio State University
Desired Characteristics of Beginning Agricultural Education Instructors as Perceived by School Administrators	Ayla R. Detwiler, John C. Ewing, & Daniel D. Foster	Pennsylvania State University
Effectiveness of Integrating Video Clips into the Secondary Agricultural Education Curriculum	Gaea Wimmer and Dr. Courtney Meyers	Texas Tech University
Exploring the Indicators of an Effective Agricultural Educators' Professional Development Event: The DELTA Conference	Nina Crutchfield	Texas Tech/Texas A&M
How are Students Thinking Critically? Measuring the Difference between Seeking Information and Engagement	Alexa J. Lamm, Rochelle Strickland, Dr. Tracy Irani	University of Florida
Identifying Graduate Students' Areas of Concern	Courtney Meyers & Gaea Wimmer	Texas Tech University
Improving Undergraduate Curriculum: What do our Alumni Think? *	Kori Barr, Erica Irlbeck, Cindy Akers, Courtney Meyers, David Doerfert, & Alyx Shultz	Texas Tech University
Leadership and Decision-making Life Skill Development in 4-H Shooting Sports Participants	Shanna M. Holder, Dr. John L. Long, Dr. Michael E. Newman, Dr. Susan L. Holder	Mississippi State University
Northwest's Supply & Demand for 2009-2010: Who is filling the Ag Teaching Positions? *	Ben Swan	University of Idaho

Title	Author(s)	Institution(s)
Perceptions of Pre-service Agricultural Education Students Enrolled in a Model	Elizabeth B. Wilson, Kevin W. Curry Jr., Chad. V. Jordan, Char E. Farin	North Carolina State University
Perspectives on the Future of Rural Education in Nebraska	Caleb Harms and Dann Husmann	University of Nebraska-Lincoln
Professional Educators' Understanding of Agricultural Awareness and Literacy in a Mid-Western State	Vikram Koundinya, Robert Martin, and Ashley Batts	Iowa State University
Student Interest Survey in an Interdisciplinary	Robert Birkenholz	The Ohio State University
Students' Self-Perceived Critical Thinking Skills in an Agricultural Ethics Course	Courtney Quinn, Heath Harding, Gina Matkin, Mark Burbach	University of Nebraska-Lincoln
Students' Perceived Value of the Contribution of Instructional Methods Towards Understanding Risk & Crisis Communication	Mrs. Christy Witt, Dr. David Doerfert, Dr. Tracy Rutherford, Dr. Theresa Murphrey, & Dr. Leslie Edgar	Texas Tech University, Texas A&M University, & University of Arkansas
The Educational Processes: Relative Importance To Extension Educators	Nav R. Ghimire and Robert A. Martin	Department of Agricultural Education, Iowa State university
The Relationships between Instructional Efficacy and Motivational Orientations for Florida Master Gardeners	Dr. Robert Strong & Dr. Amy Harder	University of Florida
The Role of Animation Towards Cognitive Achievement	Ron Koch, Don Edgar	University of Arkansas
Tips from the Trenches: Teaching Advice for Beginning Academics*	Kelsey Hall	Texas Tech University
To Teach Or Not To Teach: What Factors Impact Pre-service Students' Decision to Teach?	Dr. Steven J. Rocca and Dr. Wendy Warner	California State University, Fresno and North Carolina State University
Using Mathematics Enrichment Activities in Preparation for the Agricultural Mechanics CDE	Kirk Edney & Tim H Murphy	Texas A&M University

* Regional Winner

A Model for Improving Faculty Instruction in Colleges of Agricultural & Environmental Sciences

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A Model for Improving Faculty Instruction in Colleges of Agricultural & Environmental Sciences

Introduction

As universities grow and establish satellite campuses to better serve students, teaching responsibilities are often placed on faculty that previously only focused on research. This situation, while providing opportunity to transfer new research findings directly to university students, also creates a situation where people with no education training are expected to teach successfully. To address this issue, the [University] [Department] held a series of workshops, in 2008, to improve college teaching. The entire [Satellite] Campus faculty and staff were invited to attend workshops delivered by agriculture education faculty and lunch was provided in order to encourage participation

Conceptual Framework

The [College] at [University] established undergraduate programs on the [Satellite] Campus in 2004. This campus has housed research faculty for many years, yet few faculty members had experience teaching undergraduate courses. Consequently, a series of faculty development workshops were developed and conducted that focused on the implementation of learner-centered teaching techniques to improve comprehension and retention (McKeachie, 2006). Participants were administered a pretest before the series of workshops to determine their level of knowledge concerning such techniques. Following the workshops, a posttest and a survey were administered to determine the change in participants' knowledge base as well as the participants’ perceived value of each of the experiences (Waters & Haskell, 1989). Workshop topics covered a broad range of topics important for developing effective teaching skills. While the immediate intended result of this project was to assist faculty members to develop professionally as “new” instructors, the long range goals include the development of graduates who recognize the intricate relationship between math, science, and agriculture.

Methodology

The 2008 series of workshops were conducted beginning the Friday of the first week of the fall semester and continued each Friday for four weeks. The first workshop was scheduled for 90 minutes and subsequent workshops were 60 minutes. Topics covered during each workshop are listed in Table 1. All campus-wide faculty from the [College] were invited to attend and while topics were presented in a complimentary sequence, they were independent of each other, thus faculty could choose to attend any or all of the presentations. Participant responses were recorded using a pre and post test as well as a final evaluation form with open ended questions and statements with Likert-type responses. Means and standard deviations were calculated for pre and post test items and final evaluation items using SPSS 14.0.

Table 1
Teaching Faculty Workshop Series Topics

Meeting	Topics Covered	Pre Test	SD	Post Test	SD	Dif.
1	Teaching Theories	2.3	0.34	3.2	0.75	0.9
	Teaching Philosophies	2.9	0.25	4.1	0.34	1.2
	Teaching Styles	3.1	1.32	4.6	0.79	1.5
	Learning Styles	2.4	0.76	4.4	0.13	2.0
	Instructional Planning	3.7	0.34	4.9	0.65	1.2
2	Delivery Methods	3.2	0.39	4.5	0.25	1.3
	Instructional Technologies	4.0	0.23	4.9	0.41	0.9
3	Effective Teaching Methods	3.0	0.43	4.8	0.29	1.8
4	Evaluation of Student Learning	2.9	0.86	4.5	0.13	1.6

Findings

According to the pretest, participants self reported that they were least familiar with the concepts related to teaching theories (2.3) and learning styles (2.4); the participants were most familiar with instructional technologies (4.0) and instruction and instructional planning (3.7). Analysis of the posttest indicated that, following the workshops, participants were least familiar with teaching theories (3.2) and teaching philosophies (4.1); the participants were most familiar in the areas of incorporating instructional technology (4.9) and instructional planning (4.9). The survey revealed that participants showed the greatest self reported change in knowledge with learning styles (2.0) and effective teaching methods (1.8).

Conclusions

Participants in this series did show a marked increase in knowledge reflective of the workshops that were offered; they took away the highest self reported increase in knowledge regarding learning styles and effective teaching methods. While the increase in knowledge regarding the topics listed in the workshop is a positive indication that the workshops were effective the participants still showed a considerable lack of knowledge regarding teaching theories.

Recommendations

The majority of [College] faculty teaching on the [Satellite] campus have had no training in how to be effective teachers. The presence of faculty teaching agricultural education courses provides an opportunity to share information on teaching and learning in a format suitable for faculty continued professional development. The findings of this research suggest that future professional development workshops should be conducted by agriculture education faculty to assist other faculty in developing teaching skills.

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Poster Type (Research)

A Perceptual Analysis Of State Supervisors' Views Towards Inclusion In Secondary Agricultural Education Programs

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A Perceptual Analysis Of State Supervisors' Views Towards Inclusion In Secondary Agricultural Education Programs

Abstract

The purpose of this descriptive survey census study was to gauge the readiness of secondary agricultural educators throughout the United States to foster inclusive learning environments for all students as perceived by state directors and supervisors. Secondary agricultural education teachers were perceived to be prepared to serve women and socioeconomic diversity, but not ethnic minorities, learning style diversity, diversity of gender identification, religious diversity, and special needs populations. It was found that agricultural education is beneficial for ethnic minorities and women, but still there is a lacking by secondary agricultural teachers to handle these issues. Barriers to inclusion in secondary agricultural education were found to be guidance counselors, the perception of agriculture itself, the lack of role models, the lack of understanding student styles, and stereotypes. It was recommended that secondary agricultural education professionals receive preservice and inservice training in multicultural education and differentiated instruction, and that relationships be formed with school officials and the community in general in order to foster inclusion efforts.

Introduction

The United States has become more culturally and linguistically diverse (Faltis, 2006). Since the 1980's the population has grown at the rate of 9% per year, creating a significant increase Hispanic, Asian, Pacifica Islander, Native American, and multiracial populations (Files, 2005). These demographic changes have greatly impacted America's public schools, which has grown to an enrollment of over 50 million students, and contains multiple races, cultures, and other types of diversity (Feller, 2005). Given this factor diverse students are likely to experience conflicts if schools are not sensitive to their culture, language, family background, religion, sexual orientation, and learning styles (Short & Echevarria, 2005). When considering the teaching workforce in America is greatly European American (86%), female (75%), and middle-aged, many factors can affect the instructional environment, one of which is the communication channels between students and teachers that affect the development of inclusive learning environments (National Education Association, 2003). Given the fact 1 out of 6 jobs in America is agriculture related more emphasis needs to be placed on creating and implementing opportunities for inclusiveness through efforts of agricultural literacy.

Conceptual Framework

Inclusion is a philosophy that brings students, families, educators, and community members together to create schools and other social institutions based on acceptance, belonging, and community (Sapon-Shervin, 2003). Inclusion is based upon four major principles:
1. ***All Learners and Equal Access, 2. Individual Strengths and Challenges and Diversity,***
3. Reflective Practice and Differentiated Instruction, 4. Community and Collaboration

Methodology

The population for this census survey study consisted of all state Directors/supervisors of agricultural education. The survey utilized for this descriptive census study was adapted from a previous study conducted by Warren & Alston (2007). The survey was sent by email using a three round, one week interval formal. The final response rate was 85% (N = 42).

Findings

- With respect to working with women and socioeconomic diversity it was perceived that agricultural educators are prepared. In contrast it was found that secondary agricultural educators were somewhat prepared to work with English As a Second Language (ESL) students. Moreover, respondents were undecided if secondary agricultural educators were prepared to work with individuals with learning disabilities, learning style diversity, special needs populations, diversity of gender identification, and ethnic minorities.
- It was agreed upon by respondents that secondary agricultural education is beneficial for women and minority students in relation to their leadership and character development.
- It was found that inclusion is beneficial for secondary agricultural education and FFA programs overall. It was agreed upon that the lack of role models, the perception of agriculture itself, the lack of understanding a students' learning style, and stereotypes hinder the development of inclusion in secondary agricultural education.
- It was also agreed upon that guidance counselor are major barrier to inclusion in secondary agricultural education.
- It was agreed upon that forming relationships within the local community, with advisory groups, and with guidance counselors were inclusion solutions.
- Furthermore it was perceived that preservice and inservice training in differentiated instruction and multicultural education were solutions to fostering inclusion. It was also agreed upon that school administrator support and content analysis of curriculum materials were solutions to fostering inclusive learning environments.

Conclusions

- State Supervisors saw agricultural education as being beneficial to minorities, however they were unsure if agricultural education teachers were prepared to work with minorities. Given this perhaps agricultural education teachers do not receive enough training in relation to working with minorities.
- It was perceived that women benefit from participation in agricultural education and that agricultural education teachers are prepared to work with them. Perhaps agricultural education teachers are now receiving better training in relation to working with women.
- It was perceived that working with different learning styles was a barrier to creating inclusive learning environments in agricultural education, perhaps preservice and inservice agricultural education teachers are not receiving enough training in this area.
- It was found that Guidance Counselors have a major influence upon Agriculture Education Inclusion, perhaps stronger relationships need to be developed with them.
- State Supervisors indicated that Agriculture Teachers were not prepared to work with special need children, perhaps Agriculture Teachers lack training in this area.

Recommendations

- It is recommended that preservice and inservice agricultural education professionals receive training in differentiated instruction and multicultural education.

Implications

- In order for the United States to sustain its current agricultural rank, recruitment of a more diverse future workforce must be enhanced. The field of education and agribusiness as a whole must acquire an understanding of the motivational factors and rewards that would motivate or encourage diverse groups to pursue an agricultural career.

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Innovative Idea

Agricultural Education "Un-Plugged": Using Wireless Slates (WS) during Student Teaching in Agricultural Education

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Agricultural Education "Un-Plugged": Using Wireless Slates (WS) during Student Teaching in Agricultural Education

Introduction

The current budget constraints facing many school districts require teachers and administrators to review closely functionality and cost when selecting technology for the classroom. The use of "interactive whiteboards [IWBs] are becoming increasingly popular in educational environments" (Haldane, 2007, p. 257). The average cost to equip a classroom with an IWB is $2,100.00 (Bunch, Whisenhunt, Edwards, Robinson, & Ramsey, 2010) assuming the computer and projection technology to support the IWB is already in place. An alternative to IWBs that allows for similar functionality at a significantly reduced cost is the Wireless Slate (WS).

Wireless Slates can be used with or without IWBs; each combination has a different effect on teaching and learning. In classrooms that employ both IWBs and WSs, teachers and students are given flexibility and mobility options that are otherwise unavailable. However, when the WS is used as a stand alone device, it functions easily with a projected image, enabling students and teachers to control applications and write over text and images from anywhere in the room (*"The Truth about,"* 2007).

Teachers often teach as they were taught (Nelson & Thompson, 2005). Although most agriscience teachers actively explore and adopt technology for regular use in instruction, limited active experimentation and advanced integration of technology in instruction occurs (Kotrlik, Redmann, & Douglas, 2003). So, it is imperative that the use of technology-enabled classrooms in teaching methods courses for pre-service AGED students are facilitated.

How it Works

The spring 2010 student teaching block at XXX University included 27 student teachers. The "block" is comprised of two four-week courses that work in concert to prepare student teachers for the 12-week student teaching internship: AGED 4103, *Methods and Skills of Teaching and Management in Agricultural Education* and AGED 4113 *Laboratory Management in Agricultural Education.* AGED 4103 includes a lab that serves as the "micro-teaching" component of the block. The spring 2010 block required four lab sections. To insure that each lab was equipped with appropriate technology, WS was introduced in one of the microteaching laboratories.

The classroom in which the WS was used is traditionally equipped (i.e., chalkboard, pull down projection screen, and an overhead projector). To convert the classroom to a technology-enabled classroom required that a computer, projector, and WS be transported daily via a "technology cart." Introducing the WS into a traditional setting provided student teachers in that lab section the opportunity to practice teaching their lessons while employing all of the features their peers were using in the rooms equipped with IWBs.

Results to Date

Seven of 27 student teachers used the WS during the student teaching block in the spring 2010 semester. Those students were able to control applications (i.e., SMART Notebook and the tools associated with IWBs) and write over text and images from anywhere in the room. The WS allowed pupils with limited mobility or who were simply uncomfortable standing in front of the class to use the WS to manipulate images, words, and objects. Student teachers who used the WS initially struggled to implement the new technology into their practice. But most became more confident with each lesson they presented. For example, early in their experience, a student teacher commented that, "First use of the WS was uncomfortable and dissimilar from the IWBs." However, student teachers learned that by using the WS they were able to maneuver around the classroom and address student management issues with minimal negative impact on the learning environment. Attending to behavior issues in such a manner allowed the WS to gain support among the student teachers.

Future Plans

AGED faculty at this institution will continue to integrate WSs into microteaching settings during the student teaching block as well as earlier pre-service courses. Further, as student teachers complete their 12-week internships, an opportunity to introduce the WS to cooperating teachers exists. Student teachers are in a unique position to serve as change agents regarding the adoption of this technology by cooperating teachers. The professional relationship that develops between the student teacher and the cooperating teacher creates a situation for interpersonal communications that can impact the early stages of the innovation-decision process for potential adopters positively (Rogers, 2003).

Cost

Given the current economic down turn, public school administrators may consider the WS as a first step to creating technology-enabled classrooms. The WS used during the student teaching block was purchased for $340.00 (approximately an 80% cost savings compared to the average cost of an IWB as reported by Bunch et al., 2010).

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An Exploratory Study of Students' Oral Presentation Self-Efficacy

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An Exploratory Study of Students' Oral Presentation Self-Efficacy

Introduction

A major goal of undergraduate educators should be to produce graduates with communication skills sufficient for success in the workplace (Zinn, Faustman, & Riesen, 1993). For example, enhancing communication skills will contribute to a student's ability to work together, to speak to diverse audiences, and to communicate their knowledge and expertise more widely to a variety of audiences (NRC, 2009). In a recent presentation to the American Agricultural Economics Association, Boteler (2006) noted that communication skills were two of the top three rated skill sets that agribusiness employers sought in new college graduates. This finding is important considering that the inability to communicate effectively is a significant disadvantage for agricultural graduates (National Council for Agricultural Education, 2009).

In recent years, calls have been made for graduates to be proficient in oral communication skills so that they can function effectively the workplace (Crosling & Ward, 2002). Oral communication covers a wide area, ranging from formal presentations to participating in teams and meetings. Because the development of oral presentation skills has received little research attention (De Grez, Valcke, & Roozen, 2009; Brown & Morrisey, 2004; Alshare & Hindi, 2004; Campbell, Mothersbaugh, Brammer, & Taylor, 2001), we sought to explore undergraduate students' level of oral presentation self-efficacy using a measure based on the principles of Bandura's social cognitive theory.

Theoretical Framework

The theoretical foundation for this study is Bandura's (1986) Social Cognitive Theory (SCT). Social cognitive theory has been noted to be very well suited to explain the development of complex behavior such as oral presentation skills (Grez, Valcke, & Roozen, 2009). In particular, we were interested in self-efficacy, one of the core constructs of Bandura's theory. Self-efficacy is defined as, "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391). Self-efficacy beliefs are constructed from four principal sources of information: mastery experiences, vicarious learning, verbal persuasion, and emotional arousal (Bandura, 1997). Numerous studies have found that as self-efficacy, or a person's confidence in his/her ability to perform a task increase, performance measured after training also increases (Bandura, 1986; Brown & Morrisey, 2004). In fact, several researchers have noted the importance of confidence in giving successful oral presentations (e.g., Tucker & McCarthy, 2001; Crosling & Ward, 2004; De Grez, Valcke, & Roozen, 2006; Adams, 2004; Brown & Morrisey, 2004; Huiberts & Leeds, 2009).

Methods

Participants

Sixty-nine percent of students were male and 31% were female. Students' age ranged from 19 to 24 (M= 21.0, SD = .47). Forty-five percent of students were seniors, 49% were juniors, 4% were sophomores, and 2% were freshmen.

The research design of the study was a one-group pretest-posttest design. The dependent variable was oral presentation self-efficacy score. The intervention involved the integration of the four principal sources of self-efficacy information. Participants for this study were undergraduate students enrolled in an oral communications course in the College of Agricultural and Life Sciences at [Midwestern State University] (n = 75). The measure used to collect data was the Presentation Self-Efficacy Scale (PSES; Authors, 2007). The PSES is comprised of 15 items which measure the level of confidence students have in their ability to complete oral presentation-related tasks. Internal consistency for the measures was assessed during a pilot test resulting in an alpha reliability of .92. Descriptive statistics used included frequencies, percentages, means, and standard deviations. Paired t-tests were used to describe differences between pretest and posttest scores on the PSES.

Findings

Fifty-two percent of students had no previous course or courses that required a large number of presentations while 60% had no previous work-related experiences that required giving a large number of presentations (e.g. workshops, seminars, or meetings). Results of the paired t-tests showed significant differences in mean pretest and posttest oral presentation self-efficacy scores (Pretest mean = 4.30, SD=.80, Posttest mean =5.10, SD =.57, t=-8.436, p<.001).

Conclusions and Implications

Despite the limitations of the study, the findings indicate that the use of an intervention involving the integration of the four principal sources of self-efficacy information enhanced the oral presentation self-efficacy of undergraduate students. It should be noted that the current version of the PSES did not specifically measure the four sources of self-efficacy, hence a logical next step will be to develop a revised version of the PSES that include items measuring mastery experiences, vicarious learning, verbal persuasion, and emotional arousal. One of the major implications resulting from this study is the potential benefit to instructors seeking to enhance the oral communication skills of their students.

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Research

An Analysis of Florida Career and Technical Education Teachers' Stages of Concern Regarding the Use of Content Area Reading Strategies

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An Analysis of Florida Career and Technical Education Teachers' Stages of Concern Regarding the Use of Content Area Reading Strategies

Introduction/Theoretical Framework

The initiatives toward better readers have stated that "all teachers in all subjects share the responsibility for literacy development" (Vacca, 2002, p. 7). Other studies indicate that content area reading instruction is essential for success in the content areas as well as "overall achievement in school subjects" (Moore, Readence & Rickelman; 1983). However, research indicates that non-reading teachers, such as those in Career and Technical Education (CTE), feel that it is not their role to implement reading strategies and thus, rarely employ reading strategies (Park & Osborne, 2006a).

Some argue that CTE teachers are not employing content area reading strategies (CARS) is because they do not feel confident with their knowledge and skill level in implementing the strategies (Park & Osborne, 2006a). However, "with increased professional development… content-area teachers will make more effective use of strategies" (Vacca, 2002, p. 6).

In Florida, the Florida Reading Initiative is a reform effort aimed at achieving 100% literacy among its students (North East Florida Education Consortium, 2009). The Florida Reading Initiative provides training and additional support for teachers to implement reading strategies aimed at improving reading proficiency.

While reform efforts such as the Florida Reading Initiatives are a great step in improving literacy, assessment of the initiative's effectiveness is necessary in determining its value in career and technical education teacher training. This study utilizes the Stages of Concerns Questionnaire, developed by George, Hall, and Steigelbauer (2006) to assess the level of comfort CTE teachers of varying levels of training feel regarding the use of CARS.

Francis Fuller's Concerns-Based Adoption Model provides the framework for the stages of concern (George, Hall & Steigelbauer, 2006). When teachers make changes, the stages of concern can determine how easily and willingly the changes were implemented. The seven stages of concern rank from 0-7 and include Unconcerned, Informational, Personal, Management, Consequences, Collaboration, and Refocusing. Generally, people will move through the stages based on their familiarity with the innovation, and concerns in higher stages will typically only appear after lower-level concerns have been alleviated.

Purpose and Objectives

The purpose of this study to determine the stages of concern Florida CTE teachers experience regarding the implementation of CARS. In order to meet this purpose, the following objectives provide the focus of this study:

1. Determine the number of Florida CTE teachers with CARS training and the number of years of training experience these teachers have.
2. Determine differences in stages of concern percentiles regarding CARS implementation of Florida CTE teachers grouped by quantity of CARS training.

Methodology

An invitation for an electronic SoCQ was sent through e-mail to the population of CTE teachers in the state of Florida (N=2814). The initial invitation with the link to the survey was sent, with two follow-up reminder e-mails. Overall participation rate was 11% (*n*=315). This study is only generalizable to the CTE teachers in Florida.

The SoCQ was used because of its long and tested history of improvement as well as its high levels of reliability and validity (Bailey & Palsha, 1992; George, Hall, & Steigelbauer, 2006; Shoulders, 2010; Warner, 2009). Data was analyzed using the calculations recommended by George, Hall, and Steilbauer (2006) in Excel format developed by Scott and Persichette (2006).

Findings

Respondents were grouped by quantity of CARS training to determine potential differences between stages of concern and length of training. Forty percent of respondents had 0 years of CARS training (n=127). Approximately 27% of respondents had 1 to 2 years of CARS training (n=84). Fourteen percent had 3 to 4 years of CARS training (n=45), and approximately 19% of respondents had 5 or more years of experience with CARS (n=59).

Based on George, Hall and Steigelbauer's recommendations for data analysis (2006), concern profiles for each group were analyzed. Teachers in all groups display highest concerns in Stage 0, which demonstrate that they are concerned about many initiatives and activities, and are not strictly concerned with CARS at this time. All groups with the exception of teachers with 5 or more years of experience are concerned about their management of time and how long it takes to implement CARS, indicated by their high levels of Stage 3 concerns. All groups with the exception of teachers with zero years of CARS training indicate that they could think of alternatives to CARS that might be more efficient, and thereby may be resistant to implement CARS, through the profiles' tailing up at Stage 6. Alternatively, the tailing down at Stage 6 of those with 0 years of experience demonstrates that they are willing to change, and do not display resistance to CARS implementation.

All profiles for teachers in all categories were indicative of a negative one-two split which shows that all teachers have doubts and demonstrate resistance to CARS (George, Hall, & Steigelbauer, 2006). The higher score on Stage 2 indicates that teachers are more concerned about their professional statuses and job security than they are concerned about spending time to learn more about CARS (Shoulders, 2010).

Conclusions/Recommendations

Based on the concerns profile, CTE teachers are not completely aware of CARS or the importance of implementing CARS in their classrooms, and are resistant to their implementation, regardless of their level of training. This concurs with Warner's (2009) findings with Florida Agriscience teachers.

To properly distribute the implementation of CARS, professional development opportunities should be made available to CTE teachers in Florida. The researchers recommend that qualities leading to successful of professional development identified by previous research Garet, Porter, Desimone, Birman, & Yoon, 2001; Supovitz & Turner, 2000) should be incorporated into CARS training in order to increase the level of success teacher feel upon CARS training completion.

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RESEARCH

An Investigation of the Impact of Student Teaching on Attitudes Toward Teaching Secondary Agriculture

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An Investigation of the Impact of Student Teaching on Attitudes Toward Teaching Secondary Agriculture

Introduction/Need for Research

In a supply and demand study, conducted among 2006 agricultural education graduates, only 53 percent (401 of 785 prospective teachers) would actually choose to teach in the fall of 2007 (Kantrovich, 2007). Such research illustrates the importance of recruiting and retaining teachers into the field of agricultural education. Hammond (2002) suggests students who choose teaching as a career, generally have a positive attitude about the career. However, the question remains, how can teacher educators better understand undergraduate students' attitude toward teaching agricultural education?

Within agricultural education, research in the area of teacher recruitment and what attracts students to a career in teaching secondary agricultural education is lacking. To that end, the purpose of this study was to determine agricultural education students' change in attitudes about becoming secondary agriculture teachers as a result of participating in a student teaching internship. The following research objectives guided the research.

1. Describe students' attitude toward teaching secondary agriculture.
2. Compare students' attitude toward teaching secondary agriculture before and after student teaching.

Theoretical Framework

The Factors Influencing Teaching-Choice (FIT-Choice®) framework provides a comprehensive model to guide systematic investigation into the question of why people choose teaching (Richardson & Watt, 2006). The framework, based on the Expectancy-Value Theory (Fishbein & Ajzen, 1975), determines the strength of influence for a range of attitude, motivation and intent from individuals choosing teaching as a career. Understanding students' motivations for choosing a teaching as a career has implications for teacher education, curriculum design, and recruitment.

Methodology

This study utilized a descriptive research design method. Two agricultural education programs located at land-grant institutions were included in this study. Convenience sampling was utilized, yielding a total of twenty-two student participants. The data collection instrument used was adapted from the FIT-Choice® Scale (Watt & Richardson, 2007). Forty statements related to students' attitudes toward becoming an agricultural education teacher were asked. To analyze the impact student teaching has on attitudes of students, each participant completed the instrument twice, once immediately before and after a 15-week student teaching experience. Responses were analyzed using SPSS.

Results/Findings

Means and standard deviations for each of the twelve constructs are reported from the two administrations of the instrument (see Table 1). Cohen's *d* is reported as a measure of effect size. Because of space limitations, statistics for individual items are not provided.

Table 1
Attitudes of Student Teachers by Construct

	Time of Administration				
	Before *n* =22		After *n* = 22		Cohen's
Construct	*M*	*SD*	*M*	*SD*	*d*
Ability	3.92	.47	3.33	.33	1.49 [e]
Work with Adolescents	3.82	.60	4.08	.51	.48 [c]
Fallback Career	3.02	.77	3.29	.57	.41 [c]
Prior Teaching and Learning	4.03	.57	4.17	.62	.24 [b]
Time for Family	2.69	.60	2.55	.62	.23 [b]
Job Transferability	3.30	.57	3.18	.76	.18 [b]
Make a Social Contribution	4.24	.46	4.30	.47	.13 [a]
Intrinsic Career Value	3.86	.55	3.91	.55	.09 [a]
Job Security	3.83	.49	3.86	.41	.08 [a]
Shape the Future	4.32	.51	4.35	.44	.06 [a]
Enhance Social Equity	3.59	.51	3.61	.66	.03 [a]
Social Influence	3.85	.59	3.85	.61	.00 [a]

Note: Real limits scale for mean scores is 0.00 – 1.00=Definitely Disagree, 1.60 - 2.50=Disagree, 2.60 – 3.50=Not Sure, 3.60 – 4.00=Agree, 4.60 – 5.00=Definitely Agree; Thalheimer & Cook's (2003) descriptors for describing relative size of Cohen's *d*: [a] = negligible, [b] = small, [c] = medium, [d] = large, [e] = huge.

Conclusions/Implications/Recommendations/Impact

Prior to student teaching, the constructs of *shape the future*, *prior teaching and learning*, and *make a social contribution*, were rated most highly. At the conclusion of the student teaching experience, the means for those three constructs continued to rate quite high, exceeding 4.00. Additionally, *working with adolescents* was rated over 4.00. Overall, this indicates students have a favorable attitude toward teaching agriculture. The construct, *time for family*, was rated the lowest by students, both before and after the student teaching experience. Such mean scores suggest concerns regarding how one balances family life with a career as an agriculture teacher. It is disconcerting that students' considering the profession already have an uncertain attitude regarding teaching agricultural education and family life.

Perhaps most concerning is the huge effect size noted on the *ability* construct. Such an effect size suggests that student teachers are more confident in their abilities prior to student teaching. Although students may realize during student teaching that they have much more to learn, what could be done to maintain or improve students' confidence during the experience?

Teacher educators should become more aware of student attitudes toward teaching. Because there are numerous career options for agricultural education graduates aside from becoming a teacher, innovative and aggressive steps should be taken to make the profession more attractive. Such efforts will help to improve students' attitudes regarding the profession and ultimately, contribute to more successful recruitment and retention efforts.

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Poster Type (Research)

BEEF, It's What Makes Leaders: Leadership Skills Developed through the Georgia Junior Beef Show Program

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BEEF, It's What Makes Leaders: Leadership Skills Developed through the Georgia Junior Beef Show Program

Introduction/Need for the Research

As a leadership development activity, the Georgia Junior Beef Show program includes, but is not limited to market lambs, market goats, market hogs, breeding ewes, breeding gilts, equine, commercial dairy heifers, market steers, and breeding heifers. One of the largest and most expensive sectors of the youth livestock program is the beef project which includes market steers and breeding heifers. This study was conducted to help determine the leadership impact of the beef project for Georgia participants.

Theoretical Framework

The educational theory of John Dewey serves as the framework for this study. Specifically, Dewey's theory of value proposes that an individual needs to appreciate the topic about which they are learning, but it also believes that to value something means to perform an intellectual act of comparing or judging. According to Dewey's theory of knowledge, knowledge is developed only through live experiences. In Dewey's theory of human nature everything distinctively human is learned (Emand, 2000). Naturally, for active show participants, experiences/learning would include leadership skills that are developed through the experience of the beef project, as key leadership skills are developed through the livestock project (Rusk, Summerlot-Early, Machtmes, Talbert, & Balschweid, 2003). This study examined leadership skills developed during the time participants were engaged in beef exhibition experiences.

Methodology

This descriptive study investigated sought to employ a retrospective-post comparison of leadership skills before and after beef exhibition experiences. The population for this study consisted of senior participants in the Georgia National Junior Livestock Show. The convenience sample (n = 24) consisted of randomly selected students who were in the tie barn on the day of data collection. Of everyone given a retrospective-post version of Townsend's (1981) LSI, 100% responded with completed surveys. A examination of the show participant database indicated that the sample was representative of the population in major demographic categories. For this reason, the researcher was confident in employing inferential statistics. Paired sample t-tests were used to determine differences between retrospective and post LSI scores. The instrument used to assess changes in the students' self-perception of leadership skills was a researcher-adapted retrospective-post version of the Leadership Skills Inventory (LSI) developed by Townsend (1981). Specifically, the original instrument claimed the following Cronbach's alpha reliabilities for the LSI constructs: Communicating (.74), Working with Groups (.69), Making Decisions (.69), Understanding Self (.78) and Leadership (.84).

Results/Findings

Students were questioned in the retrospective and post-test on various aspects of leadership before they began showing after they have been showing. Students showing beef agreed that they possessed competence in each of the LSI areas [Working with Groups (Retro *M* = 1.5, *SD* = .50; Post *M* = 1.36, *SD* = .48), Understanding Self (Retro *M* = 1.64, *SD* = .56; Post *M* = 1.35, *SD* = .44) , Making Decisions (Retro *M* = 1.81, *SD* = .74; Post *M* = 1.47, *SD* = .56), Leadership (Retro *M* = 1.83, *SD* = .66; Post *M* = 1.49, *SD* = .48), and Communication (Retro *M* = 1.75, *SD* = .57; Post *M* = 1.45, *SD* = .44)] prior to and following their showing experience. LSI scores were higher following beef exhibition experience for each of the constructs. This gain in LSI scores was significant at the .05 alpha level for Understanding Self (*t* = 3.225; *p* = .004), Leadership (*t* = 3.404; *p* = .002), Making Decisions (*t* = 2.842, *p* = .009), and Communicating (*t* = 2.932; *p* = .007). In fact, these significant gains in LSI scores also had effect sizes in the medium range for Understanding Self (*d* = .580), Leadership (*d* = .596), Making Decisions (*d* = .523), and Communicating (*d* = .594), according to Cohen (1977).

Table 1
Retrospective and Post Mean LSI Scores (n = 24)

	M	*SD*	*t*	*p*	Cohen's *d*
Working With Groups Retro	1.50	.50			
Working With Groups Post	1.36	.48	1.726	.098	.286
Understanding Self Retro	1.64	.56			
Understanding Self Post	1.35	.44	3.225	.004	.580
Leadership Retro	1.83	.66			
Leadership Post	1.49	.48	3.404	.002	.596
Making Decisions Retro	1.81	.74			
Making Decisions Post	1.47	.56	2.842	.009	.523
Communicating Retro	1.75	.57	2.932	.007	.594
Communicating Post	1.45	.44			

Note. 1 = Strongly Agree; 2 = Agree; 3 = Undecided; 4 = Disagree; 5 = Strongly Disagree

Conclusions/Recommendations

Junior beef exhibitors are leaders. Students agreed they possessed leadership before and after beef project experiences, but the increase in leadership was significant in 4 of the 5 areas for Georgia junior beef exhibitors. The areas of significant leadership skill development were Understanding Self, Leadership, Making Decisions, and Communicating. These findings are encouraging, but this study was conducted with a limited convenience sample. Perhaps decision makers, parents, and industry representatives have some cause for encouragement regarding the effectiveness and usefulness of the beef project, but additional, more scientific, representative data must be captured to truly make this claim.

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BLOGGING IN THE CLASSROOM: THREE PEDAGOGICAL APPROACHES TO USING BLOGS FOR REFLECTION

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BLOGGING IN THE CLASSROOM: THREE PEDAGOGICAL APPROACHES TO USING BLOGS FOR REFLECTION

Introduction

Reflection has been a long standing tradition in agricultural education, especially as it relates to the use of experiential learning in classrooms (Roberts, 2006). There are many theoretical orientations to experiential learning and each identifies the practice of reflection as an essential learning component in the educational process (Townsend, 2002). Traditional reflection methods have included journaling (paper and electronic document), shared discussion, role play/taking, making metaphors, fish bowling, etc. However, as the student demographic changes and millennials become the prevailing student majority identifying teaching methods which align with their comfort and preferences will be increasingly important. Blogging as means to engage student reflection is an appropriate and relevant tool to add to the teaching "toolbox." Yet, before an instructor can capitalize on this method it is important to establish a basis for what blogging is and the many forms it can take as a classroom pedagogical tool.

Methodology

Blogs are part of a cadre of online tools that have grown in popularity in recent years (Richardson, 2006). Blogs, originally known as Web Logs, are instantly updateable websites that allow the author or authors to publish personal thoughts and comments in the same manner as a personal journal or diary (Blood, 2002). Scholars have commented on the integration of blogs into teaching and learning, developed specific strategies for utilizing blogs in the classroom and have suggested using blogs for the dissemination of information from teacher to learner and from learner to teacher (Gifford, 2009; Gupta & Meglich, 2008; Pittinsky, 2003; Richardson, 2006).

This poster will present three methods for using blogs in the classroom. These methods include instructor blog (teacher to learner), student blog (learner to teacher) and a combination of instructor and student blogs (teacher to learner/learner to teacher). Each of the three methods presents a unique strategy for instructors and learners to analyze and synthesize course concepts and discussions.

Results to date/implications

In an undergraduate leadership course, students participated in a 20-hour service-learning project outside of and in addition to the classroom requirement. Students were assigned to write a series of leadership blogs to reflect upon their service-learning project and integrate concepts learned in the classroom with the experiences at the project site. Students were specifically assigned to use a "what – so what – now what" model in their writing. Students using the what—so what—now what model for a blogging reflection exercise averaged higher grades and more consistently met the objectives of the assignment.

In an undergraduate agricultural communications course the instructor utilized a course blog as a tool to reach students outside of the classroom. The blog provided a means to encourage critical thinking about class topics or objectives, as well as additional academic content that could not be covered in class. Using blogs in this manner allows for more time outside the actual classroom that instructors can stimulate thought and provide extra incentive for searching out and using additional resources.

In a graduate leadership course both instructor and students blogged about personal leadership experiences. This allowed for students to have a model of blogging provided by the instructor, but also provided students with insight into the instructor's thoughts about leadership and her faculty role. Students shared their personal stories and thoughts over the course of the semester and were encouraged to read one another's blogs and post comments which were supportive and reflective. Additionally, a course blog was developed to host thoughts and perspectives related to the course, as well as provide a platform for links to student blogs. It has been found to be an innovative way to have students reflect on their experiences and familiarize them with social media.

Future plans/advice to others

Educators' use of internet tools will enhance teaching and learning with a generation of students who are increasingly using the internet as a primary source of information (Gupta & Meglich, 2008). Educators may find adaptation of pedagogy to meet this shift toward the internet to be a particularly useful and effective method for meeting the learning styles of today's students (Pittinsky, 2003).

Educators may consider integrating blogging technology into the learning experience for students by replacing hand-written or hard copy journals with online blogs. Educators may also find blogging useful as a means for disseminating, reviewing and supplementing course material. Anecdotal and quantitative evidence support the effectiveness of use of blogs in the classroom. Educators should consider which of the three methods described would be most effective and appropriate for their classroom.

Costs/resources needed

No costs are associated with most blogging activities. Many blog hosting websites are free of charge and provide free hosting services for blogs (i.e.—Wordpess, Blogspot, Blogger, Typepad).

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Innovative Poster

Bringing Experience Into the Classroom Through the Use of Blogs

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Bringing Experience Into the Classroom Through the Use of Blogs

Introduction/Need for Innovation or Idea

Dewey (1938) emphasized the need for experience as a basis for true learning. Preservice agricultural education programs promote the acquisition of experience through a variety of ways, including field trips, observations, and field experiences. With an increase in the popularity of blogging in today's society and among educators, the inclusion of blogs provides an additional method of connecting course content to real world experience. A blog is essentially a website that enables an author(s) to publish instantly to the Internet. Blogs include conversations and reflections that are constantly updated and promote reader interaction through questions, links, and comments. They are also relatively user-friendly, requiring about the same amount of technological savvy as sending an email (Richardson, 2009). As noted by Solomon and Schrum (2007), "With this new means of publishing, educators are free to share their ideas about issues and offer examples of what works" (p. 56).

How It Works

Through the use of technology resources such as Twitter, Google Reader and educational websites, finding a variety of educational blogs is effortless. For example, the Scholastic (2009) website maintains a list of "Top 20 Teacher Blogs". Bloggers may also suggest additional blogs for reading. Larry Ferlazzo is a teacher and blogger who has created lists of recommended blogs such as "The Best ESL/EFL Blogs" (2009c) and "The Best Places to Find Good Education Blogs"(2009a). By identifying and consistently reading relevant blogs, course instructors can bookmark blog posts that supplement course topics and utilize posts as references or as part of a course assignment. Instructors may also consider having students read specific blogs throughout the semester.

Results to Date/Implications

Blogs have been used to supplement content and assignments in two courses. In Computer Applications in Agricultural Education, content topics include using Twitter as a Teaching Tool, Wordle, and Google. Students are directed to read applicable blog posts and then have the opportunity to discuss the additional information and ideas acquired from the blogs in class and through discussion board posts. In Teaching Methods for Agricultural Education, students are required to read the blogs of new teachers as an example of teacher reflection and refer to blogs for classroom management ideas. Table 1 provides more specific information on a few of the blogs currently integrated into the courses.

Table 1
Blogs Used to Supplement Classroom Instruction

Course Topic	Blog	Title of Blog Post
Twitter	Teach Paperless (2009)	Best Practices in a Twitter Enhanced High School Classroom
Wordle	The Clever Sheep (Lucier, 2008)	Top 20 Uses for Wordle
Google	A Math Teacher Living in the 21st Century (2009)	True Life: Google Saved My Life
Teacher Reflection	Miss Calcula8 (Miller, 2009)	Week 10
Classroom Management	Larry Ferlazzo (2009b)	What Do You Do When You Have a Few Minutes Left in Class?

Future Plans/ Advice to Others

The inclusion of blogs into the classroom has been an excellent method of providing preservice teachers with the opportunity to gain additional insight and ideas from other teachers and will be continued in the future. Currently, it is a challenge to find blogs that are maintained by agriculture teachers. To help promote the creation of blogs specific to agricultural education, blogging will be promoted as a reflection tool throughout teacher education coursework and student teaching. Also, blogs can be used in induction programs to help novice teachers establish a professional network of other novice and experienced teachers who can provide comments and suggestions.

In an effort to make blog reading a more time efficient process, faculty members should utilize Google Reader and bookmarking sites such as Delicious to help organize blogs and keep current with new blog posts. With the opportunity for students to interact with educators from around the world, faculty members should provide instruction on professional conduct in an online environment. Students may need assistance in learning how to communicate most effectively using language and online etiquette appropriate for the profession. Students may also need to be reminded that blogs are a forum for all opinions and they may not necessarily agree with all that is written in a blog.

Costs/Resources Needed

The only resources needed to begin incorporating blogs into the classroom are a computer, Internet access, and time to search and review blogs. Those with little or no prior blog experience may require extra time as they become familiar with blog sites and begin interacting through reading and commenting on blogs.

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INNOVATIVE

Build Me, See Me, Touch Me, Remember Me: Display Boards for Student Teachers

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Build Me, See Me, Touch Me, Remember Me: Display Boards for Student Teachers

Introduction

Cognitive principles suggest that the inclusion of visual displays in the classroom lecture facilitates learning (Levin, 1976; McCormick, 1994; Seaman, 1998). A small portion of what a person sees actually makes it to working memory and an even smaller portion is processed for storage in long-term memory (Seaman, 1998). Information retention increases as more of the learner's senses are involved (McCormick, 1994).

The use of demonstration boards is effective in teaching agricultural mechanic skills (Bear & Hoerner, 1980). Realia and three-dimensional objects are commonly used to gain student interest when digital displays are unpractical. Display boards or demonstration boards are used for showing examples of products. The educational value of a display board is to show a process.

The purpose of this abstract is to describe the process of student teachers constructing their own display boards for use during their 14-week field experience. The goal of the activity is to provide student teachers with experience in developing and practicing fabrication skills, working cooperatively in small groups, and creating a final product which has utility as an instructional tool.

How it Works/Innovation

Students are shown many uses of display boards in the agricultural mechanics laboratory. The discussion leads from the value of the display board to the "how to construct" a display board. The material used is masonite peg board. Pegboards provide strength and can support the weight of realia (Bullough, 1981). The students are asked to divide a 4 foot by 8 foot sheet of pegboard into smaller equal-sized units. The finished size of the boards depends on the number of students in the class and available materials.

All tools and supplies are set up and arranged in the lab prior to the class. A panel saw is used to cut the pegboard (table saw or circular saw may be substituted). Miter saws are used to cut the furring strips which serve as the frame of the display board. The finished boards will measure 24 inches by 32 inches.

The boards are framed with 1 inch by 2 inch furring strips mitered to 45 degrees on the end. The corners are joined using #0-size hardwood biscuits and wood glue. The frames are fastened to the board from the back with round-head wood screws. Edges of the frame are rounded using a router. Open joints in the corner are filled with wood putty prior to sanding. The boards are finished with stain and varnish. Construction will take a class one full day to reach the finish stage. One of the benefits of this activity is that students gain experience with several power tools such as a panel saw, miter saws, biscuit jointer, cordless drill, router, and palm sander.

The class is divided into three groups. The first group will layout, measure and mark the sheets of pegboard, and cut each sheet into 24 inch by 32 inch pieces using a panel saw. The second and third groups will measure and cut the 1 inch by 2 inch furring strip used for the frames. One group measures and cuts the 32 inch side pieces and the second group measures and cuts the 24 inch end pieces. Before any construction begins, the students are reminded about personal safety and provided with a demonstration on the use of the power tools by the instructor. While finished boards are drying, the lesson turns to the organization and display of realia. Students will be using their boards during a plumbing instructional unit. Each student is provided with an assortment of fittings and samples of pipe materials used in making a lawn sprinkler. The task is to create a display that is both eye-catching and educational. Students are challenged to create a board that is interactive. A scoring rubric is provided at the beginning of the assignment. Each student performs a self-assessment before submitting the project to the instructor. The rubric serves as an example for the student-teacher from which they can adopt and use during their own teaching experience.

Results to Date/Implications

The peg board is suitable for both large-group and small group instruction. Items may be temporarily attached using “S” hooks or Velcro strips. For more permanent mountings, zip ties or wire is used. The display board is a teaching tool that does not replace the teacher but serves as an extension of the teacher. A well conceived display board will be a valuable resource in a lab to show a process to completing an activity. The display boards are versatile so they may be used for any instructional area. Student teachers are challenged to build additional display boards for their teaching facilities.

Future Plans

The next step is to create display boards which are interactive. An electric board can be constructed by adding a conductor, light, and low-voltage power source (i.e., 6-volt battery). The result is a hands-on matching activity.

Costs/Resources Needed

All supplies can be purchased at a home improvement center. A laboratory with the necessary power tools and work tables is necessary. The cost per student can range from $8 to $12. Course lab fees cover the costs. Table 1 is a list of materials.

Table 1
Tools and materials for constructing display boards for a class of 12 students

Tools	Materials	Costs
Panel Saw	1/8” x 48” x 96” Pegboard (2 sheets)	$9.78/sheet
Miter Saw (2)	1” x 2” x 120” Furring Strips (15 pieces)	$2.24/each
Biscuit Jointer (2)	Wood glue (2 bottles),	$3.99/bottle
Portable Router (2)	#0 Biscuits (1 package)	$3.26/package of 50
Palm Sanders (4)	Quarter-sheet, Medium Grit Sandpaper	$14.97/20-pack
	Assorted Stains (2 quarts)	$7.18/qt.
	Chip brushes	$8.97/ 15-pack
	Wood Putty	$3.88/container
	Zip ties or wire	

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Components of Teacher Identity as Indicated by Clinical Faculty

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Components of Teacher Identity as Indicated by Clinical Faculty

Introduction/conceptual framework

According to the National Council for Agricultural Education, the national long range goal for agricultural education calls for 10,000 quality agricultural science programs by the year 2015. In addition to this goal for national growth of programs, as the "baby boom" teachers near retirement age, it becomes critical to increase the number of strong teachers prepared to enter and stay in the classroom (Jorissen, 2002). The development of an identity in relation to a specific practice – such as teaching – leads to sustainability in the field (Collay, 2006; Luehmann, 2007).

Identity is an individual's answer to the question, "who are you becoming?" and makes learning an ontological transformation (Hodges, 1998). As the question is phrased as "becoming" and not a point at which one can arrive, identity is a changing view of self and can be viewed as a trajectory (Wenger, 1998). The formation of an identity allows an individual to become a full participant in a community of practice and thereby have access to the resources of the community (Hung, 2008; Luehmann, 2007). Identity includes definition by self and others, the familiar and unfamiliar, where one has been and is going, how each component is incorporated into one identity, and local and global belonging (Sachs, 2001). Clinical faculty members serve as experts in a community of practice that is rooted in the practice of teaching. In their role as experts, clinical faculty shape the pre-service teachers' trajectories within the community thereby affecting the development of an identity as a teacher. As definition by others is a component of identity development, the beliefs the clinical faculty have about qualities of good teachers impacts the professional identity formation of pre-service teachers (Zukas, 2006; Sachs, 2001).

Methodology

Seven clinical faculty, the on-sight cooperating teachers, were interviewed during the pre-service teachers' semester of student teaching. The interviews followed a semi-structured format and were audio-recorded for accuracy. Clinical faculty reviewed the transcripts for a member check. The interview transcripts were coded following a constant comparative analysis process and themes emerged (Boejie, 2002; Cresswell, 2007). Comparisons to the literature and between subjects provided triangulation (Anfara, Brown, &Mangione 2002).

Results

Clinical faculty indicated rapport with students, flexibility, adoption of teacher routines, being a learner, balancing life and work, professionalism, experimentation, and passion, as essential to teacher professional identity (Table 1).

Conclusions & Implications

As experts' perceptions contribute to the development of a professional identity, it is important to know what clinical faculty value in teachers. Through discourse with the pre-service teachers about what it means to be a teacher, clinical faculty affect what the pre-service teacher will value and whether the pre-service teacher will see those qualities in him- or herself (Hallman, 2008, MacLean & White, 2007).Therefore, a teacher preparation program should address rapport with students, flexibility, adoption of teacher routines, being a learner, balancing life and work, professionalism, experimentation, and passion, as essential to teacher professional identity as these are valued by the clinical faculty.

Table 1.
Essential Components of Teacher Identity

Category	Quote
Rapport with students	You need to show the students that it's ok to have some humility and to be goofy in front of them and to laugh and let them know that, you know, we make mistakes too. The kids like her, she's an excellent counselor. The students knew that she cared about them. And that is half of the mission… If they know that she cares about them, she could stand up here and teach anything and it wouldn't matter, they would take it in.
Flexibility	She adapts very well to change. And that, or course, is very beneficial because of when the schedules change. She's very adaptable which is very important, a very good asset, when you're a teacher. She needs to be very flexible.
Faculty Routines	I encourage her to speak as if she were a faculty member… So I try to treat her like she's another faculty member. I'll send her down, like if we have an IEP meeting or something. She's attended a building leadership meeting… She presented in front of them and spoke with other teachers about remediation ideas.
Learner	She was very accepting to any and all advice I was willing to give her at any time. She is always trying to make herself more aware of the things that are going on over a longer period of time. She's willing to say, 'hey, this isn't working, what do I need to do?'
Experimentation	She tries new things, she tries different things. She's tried some new things. And some have worked really well… She's feeling herself out as a teacher. She's very conscientious about making sure she tries different things.
Life Balance	Finding balance is an issue for anyone, as far as personal life, work life, and at times that's very overwhelming and I think that everyone experiences that. You have to be willing and get beyond that and still conduct all your business at school and somehow separate that.
Passion	She's got a passion. And it's a real passion for students, a real passion for teaching and what she's doing. She's willing to put in the long hours that it takes. She doesn't give up and I think that's a pretty good sign of a good teacher.
Professionalism	She is the ultimate professional..if she says she's going to do something, it's done. She will come and see what needs to be done..she's been very proactive in that. She is the ultimate professional. She's not a whiner or a complainer… She really does want to do a good job.

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Culturally Competent Secondary Agriculture Teachers:

The Multicultural Awareness-Knowledge-Skill-Attitude Assessment

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Culturally Competent Secondary Agriculture Teachers: The Multicultural Awareness-Knowledge-Skill-Attitude Assessment

Introduction/Need for Research

The United States continues to become more ethnically diverse each year (Census, 2006), yet students continue to be taught predominately by White teachers (National Center for Educational Statistics, 2001). As schools continue to diversify in student enrollments, so should secondary agricultural programs. While there are no easy solutions for recruiting a large quantity of ethnically and culturally diverse agriculture educators (Talbert, Larke, & Jones, 1999), agricultural teacher educators should prepare current and future teachers to become more competent at teaching to an increasing ethnically and culture diverse student population.

Authority provides evidence that many secondary teachers lack the knowledge, awareness, and skill to relate with students of different cultures (Bennett, 1993; Gibson, 1984; Downey & Pribesh, 2004). This lack of competence and additional research led Wendt (1993) to suggest that secondary agriculture teachers have an “embedded bias” in the classroom among students of different cultures. Propositions identify multicultural social competence, learning how to interact with and understand people who are ethnically and culturally different from themselves, as a major priority for teacher education programs (Gay, 1995).

Based upon teacher perceptions, Bruno and Doscher (1981) found that the higher the percentage of African-American students attending a school, the less attractive the school was, and the higher the number of requests for teacher transfers. In 1998, the National Center for Educational Statistics reported that less than 20% of teachers who reported teaching ethnically diverse students felt prepared to meet the needs of their students. More recently, a study by Vincent, Killingsworth, and Torres (2009) found that the level of concern when teaching culturally different students to be significantly lower among preservice agriculture teachers than preservice teachers in other content areas. It is time the profession investigates, evaluates, and develops culturally competent teachers.

Conceptual/Theoretical Framework

For this particular instrument development idea, the Multidimensional Model for Developing Cultural Competence, MMDCC, (Sue, 2001) was selected. The concept of the MMDCC recognizes the cognitive and constructive stages that reflect the competence level of a secondary agriculture teacher. In addition, the model reflects and explains the important role that cultural competence plays on the ethnic enrollment of an agriculture classroom within a school district representative of diverse learners.

Methodology

To assess the level of cultural competence among secondary agriculture teachers, two primary data collection instruments were used. The first was the Multicultural Awareness-Knowledge-Skills Survey: Teacher Form (MAKSS-T) developed by D’Andrea, Daniels, and Noonan (1994). The researcher made modifications to the MAKSS-T and incorporated an attitude section derived from the Color-Blind Racial Attitudes Scale (CoBRAS) as developed by Neville, Lilly, Duran, Lee, & Browne (2000).

Modifications made to the combined data collection instruments fostered consistency and relevance of items to agricultural education and were rewritten to meet the reading level of the participants. The changes consisted of:

- Modified awareness statements of the MAKSS-T to have consistent anchors
- Developed definitions and examples to the knowledge section
- Provided additional statements to the skills section that reflect an agriculture classroom setting
- Modified skills statements to fit the same anchors
- Amended the CoBRAS into a 5-point Likert scale besides the six point provided
- Provided additional statements in the CoBRAS (attitude section) that pertain to attitudes observed in school settings

Once modifications and the combination of instruments were complete, the instrument was considered the Multicultural Awareness-Knowledge-Skill-Attitude Instrument (MAKSA). A panel of experts (n = 8) reviewed the MAKAS to address face and content validity. The panel of experts, represented various areas of education, including multicultural counseling education. A pilot study was conducted in October of 2009 among school-based agriculture teachers in the state of Kentucky (n = 27).

Results/Findings

The results of the Cronbach's alpha (see Table 1) was .89 for the overall MAKAST teacher score while the Cronbach's alpha level within each component area resulted in a = .81 for Awareness, a = .92 for Knowledge, a = .85 for Skills, and a = .80 for Attitude**.**

Table 1.
Reliability Estimates of the MAKAS Assessment

Instrument Component Areas	Cronbach's Alpha
Awareness	.81
Knowledge	.92
Skill	.85
Overall	.89
Attitude	.80

Conclusions/Implications/Recommendations

The MAKSA includes four constructs: awareness, knowledge, skill, and attitude. The awareness construct measures an individual's sensitivity, value, respect, and familiarity with differences that exist among cultures. The second construct, knowledge, assesses the knowledge and understanding of one's worldviews, group associations, and sociopolitical influences. The skill construct assesses an individual's skills to work with minority groups, individually and institutionally. A high score on the awareness, knowledge and skill section concludes that an individual is working to become culturally competent (D'Andrea et al., 1994). The final construct, attitude, evaluates racial color-blindness. A high racial color-blindness score reflects an individual who assumes society is fair and honest to all cultures or an individual who exhibits signs of racial prejudice (Neville et al., 2000). Thus, reflecting an individual's desire to be culturally competent. It is possible that an individual score high on attitude and the overall cultural competence (sum of awareness, attitude, and skill) because the instrument is self-rated.

The developmental stages of the MAKSA are completed with implications that the instrument can evaluate the cultural competence and attitude level of rural, agriculture teachers. The instrument is limited in the accuracy of evaluating different ethnic secondary agriculture teachers. The questionnaire was tested and developed for schools with an African American population, therefore limitations exists among schools with a diverse ethnic population that extends beyond African American. A factor analysis would serve beneficial in the accuracy level of the constructs. It is recommended that the instrument be utilized at professional development workshops to assess concerns of cultural competence and racial color-blindness attitude in secondary agriculture teachers and preservice agriculture teachers.

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Research

DESCRIBING THE COGNITIVE LEVEL OF DISCOURSE OF A SECONDARY TEACHER DURING AN ANIMAL SCIENCE UNIT OF INSTRUCTION

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DESCRIBING THE COGNITIVE LEVEL OF DISCOURSE OF A SECONDARY TEACHER DURING AN ANIMAL SCIENCE UNIT OF INSTRUCTION

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Introduction/Need for Research

Teaching, like other forms of information transmission, is a communication process. Teachers send verbal messages, which contain information, to the learners who are expected to receive it and integrate it into their existing knowledge (Blum, 2006). Linda Darling-Hammond (2006) defends that deep learning requires sophisticated judgment about what and how students are learning, what gaps still exist, how to connect the material to the students' lives, and also to adapt instruction to meet common goals. Yet, Farr (1987) compiled a review of literature for a military research project, and said, "There is almost unanimous agreement that the single most important determinant of both knowledge and skill retention is the amount or degree of initial learning" (Farr, 1987, p. 5).

Conceptual/Theoretical Framework

Jean Piaget identified four factors, which influence a change in thinking. The four factors included biological maturation, activity, social experiences, and equilibrium (Woolfolk, 2004). Bloom, Engelhart, Furst, Hill, and Krathwohl (1956) established a taxonomy of educational objectives in the cognitive domain. The six levels in the taxonomy include: knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom et al., 1956).

Within Agricultural Education, Torres and Cano (1995) emphasized the importance of developing higher-order thinking in students. In addition, the researchers advocated that teachers should teach at higher cognitive levels, forcing students to do more than simply restate learned facts (Torres & Cano, 1995). Torres and Cano (1995) also stated that tests and assignments should be written at higher levels of cognition.

The purpose of this study was to determine the cognitive level of discourse in order to improve the use of current cognitive levels of discourse of secondary agricultural teachers. The research is part of a larger study to assess the cognitive level of discourse between students and teachers and its relationship to student retention of knowledge.

Methods

One high school teacher was videotaped while teaching an Agricultural Science I class of 12 freshman students. The teacher taught 18 one-hour lessons that compiled an animal science unit of instruction. The researchers viewed 18 one-hour lessons that were videotaped. The researchers examined the frequency of use of discourse as measured on the Florida Taxonomy of Cognitive Behavior (FTCB).

The class was taught March 27 through April 25 five days a week from 9:17 a.m. to 10:17 a.m. Monday through Friday. The teacher taught a three-week unit about animal science during this study. The teacher used his own curriculum, unit of instruction, lesson plans, worksheets, quizzes, tests, and other resources. (Beck, 2009)

In using the Florida Taxonomy of Cognitive Behavior (FTCB), the researcher used six-minute observation periods. Each time a cognitive behavior was observed it was categorized by making a check mark in the appropriate box for the given time. If the observed behavior represented more than one category, all categories that were involved were checked. In any given observation period each category was checked only once, even if more than one observation of that cognitive behavior had been observed (Whittington, 1991).

Cognitive level of discourse was calculated using the process employed by Pickford (1988). For each class observation, a calculation was made of the total number of times that cognitive behaviors occurred during each observation period for each of the 55 categories within the seven levels of the Florida Taxonomy of Cognitive Behavior (FTCB) (Whittington, 1991).

Results/Findings

Findings related to teacher in-class discourse include a total cognitive weighted score for teacher discourse ranged from a low of 72.23, which means the total cognitive weighted score for teacher discourse was between the knowledge and translation levels of cognition (lower levels), to a high of 100.10, which means that the teacher discourse was at the application level of cognition (higher level). Almost half (44%) of the total cognitive weighted scores for teacher discourse were at the two lowest levels of cognition, (knowledge and comprehension) which include translation and interpretation on the FTCB. Approximately 54% of the total cognitive weighted scores for teacher discourse were at the four higher levels of cognition (application, analysis, synthesis, and evaluation).

Conclusions

The results of the study indicated that the scores stayed stagnant across the levels of cognition, across the unit. The teacher did not increase higher cognitive levels from day to day. The teacher taught nearly half of the unit at lower cognitive levels and half the unit at higher cognitive levels. The data also shows that there was little change from day to day in the levels of cognition used in class. In other words, the teacher taught 27% of his lesson at the knowledge level on the first day of class, and also taught 27% of his lesson on day 17.

Recommendations and Implications

It is recommended that the researcher will use this data to investigate the impact of Bloom's Taxonomy on student retention levels. Teachers should equally use Bloom's Taxonomy across all levels. Teachers could develop a progression through learning objectives to reach higher levels of Bloom's Taxonomy. Also, higher cognitive levels could be added to the discourse to potentially build across the unit.

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Research

Desired Characteristics of Beginning Agricultural Education Instructors as Perceived by School Administrators

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Desired Characteristics of Beginning Agricultural Education Instructors as Perceived by School Administrators

Introduction/Theoretical Framework

As the pressure for higher academic achievement in high schools increases, so does the demand for highly qualified and effective teachers. All teachers, including career and technical education teachers, are expected to help students meet the academic standards set forth by state departments of education. The call for students to perform well on state mandated tests is made throughout the educational system. However, much of the impact that is made on student learning depends on the teaching that occurs in the classrooms and laboratories of the school (Hattie, 2003). Therefore, the teacher that is facilitating the learning activities must be prepared in such a way to increase the potential for student learning, and ultimately academic achievement. Adequate performance on these tests is crucial for continued funding; therefore, administrators and other school authorities understand the importance of hiring qualified and effective teachers.

Previous research (Darling-Hammond, 2009; Miller, Kahler, & Rheault, 1989; Myers, Dyer, & Washburn, 2005; Roberts & Dyer, 2004), within and outside of agricultural education, has been conducted to identify the characteristics needed by an individual to be effective in teaching. One of the most common studies, outside of agricultural education, known to those in the teaching profession was completed by Rosenshine and Furst (1971). Although this study was conducted nearly 40 years ago, the characteristics of effective teaching identified by Rosenshine and Furst are still valuable today. Business-like approach, variability, opportunity to learn, clarity, and enthusiasm are a few of the characteristics that were identified. While these characteristics are arguably important for all teachers to possess, the current study was conducted to explore specifically the knowledge and skill needed by beginning agricultural education teachers, as perceived by high school administrators. The three component model of agricultural education (National FFA, n.d.) was utilized in examining characteristics of an effective agricultural education teacher.

Methods

The purpose of the current research study was to help pre-service teacher preparation programs gain a better understanding of the desired characteristics of an effective beginning agriculture teacher. The specific objective of the research study was to identify the characteristics, in the areas of classroom/laboratory instruction, FFA, and Supervised Agricultural Experience (SAE), of an effective agricultural education teacher in <state>.

Data was collected through the utilization of a modified version of the Dillman Total Design Survey Method (Dillman, 2000). The first round of the research was conducted by phone interview, and the second round was conducted through a mailed survey instrument. During the phone interview state staff of agricultural education (FFA Association Executive Secretary, state teachers' association, state FFA facilitator, and state Agricultural Education Advisor) in <state> identified characteristics that they perceive to be important to the success of a beginning agriculture teacher. A survey instrument was then developed and a field and pilot study were conducted. Reliability coefficients (alpha) for all three areas of the survey were acceptable and ranged from .79 - .91. Following minor changes to the instrument, based on the field study, the survey instrument was sent out to high school administrators that have hired a new agriculture teacher in the past year, and high school administrators that have a veteran agriculture teacher who has been teaching in that school for more than 20 years. The administrators were asked to score each characteristic using a Likert-scale of 1 to 4 (one represented *not important*, two represented *slightly important*, three represented *important*, and four represented *very important*). Non-response was controlled by comparing early to late respondents as reported by Miller and Smith (1983). Comparisons indicated no significant difference in early to late respondents.

Results/Findings

A total of 96 surveys were sent and a total of 49 usable instruments were returned for an overall response rate of 51%. Data collected reflects that all of the characteristics identified by the stakeholders in round one of the research were also scored as important by high school administrators. On the 4-point scale the overall average for all characteristics was 3.42. Characteristics were categorized into one of three areas, to reflect the three component model of agricultural education. Categories included classroom and laboratory instruction, FFA, and Supervised Agricultural Experience (SAE). Characteristics related to classroom and laboratory instruction ranked higher than those related to FFA and SAE.

The three characteristics identified as most important in classroom and laboratory instruction included *enthusiasm about students* ($\bar{x}$=3.96), *a fair approach to all students* ($\bar{x}$=3.90), and *the ability to serve as a positive role model for students* ($\bar{x}$=3.90). The three characteristics identified as most important when advising an FFA chapter included *the ability to motivate students* ($\bar{x}$=3.79), *the ability to be genuine with students* ($\bar{x}$=3.72), and *the ability to work well with others* ($\bar{x}$=3.69). The three characteristics identified as most important when supervising SAE projects included *enthusiasm about agricultural education* ($\bar{x}$=3.86), *the ability to keep administration informed* ($\bar{x}$=3.66), and *the ability to evaluate student performance* ($\bar{x}$=3.63).

Conclusions/Implications/Recommendations

High school administrators believed that all 69 characteristics identified by <state> agricultural education stakeholders were important. Based on the results of the study, the administrators perceived that each of the characteristics were important or very important for a beginning agriculture teacher to possess. Thus, agriculture teacher preparation programs must realize that in the three areas of the agricultural education model (National FFA, n.d.) administrators expect beginning teachers to have knowledge and skills in each area. Teacher educators should review the characteristics outlined in the study and compare these to their current preparation practices to determine if the current practices are meeting the expectations of the administrators that hire their graduates. If not, these teacher educators should determine what if anything should be changed in the program.

Classroom/laboratory instruction was deemed most important by high school administrators when looking at the entire agricultural education model. Although the three overall mean scores for the construct areas were *important*, classroom/laboratory instruction was higher overall. This may be in part to the fact that some administrators are not as familiar with FFA and SAE. However, teacher educators should consider the importance of classroom/laboratory instruction characteristics, in the eyes of administrators, as they prepare future agricultural education instructors.

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Innovative Poster

Developing a Diversified Program: The Madison County 4-H Youth Outreach Project

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Need for Idea

[County] County, [State] has a rich mixture of people from different economic and ethnic backgrounds. According to the latest census, people of color represent over 40% of the county's population (U.S. Census Bureau, 2007). Economically, the median household income is $29,613 per year while 20 % of the county's population lives under the poverty level (U.S. Census Bureau, 2007). While the county's 4-H program is vibrant and growing, children of color and non-traditional youth have typically been underrepresented in many of the county's 4-H initiatives. Although there are many contributing factors that may potentially play a role in the lack of participation by these groups, the [County] County 4-H Youth Outreach Program was implemented to eliminate many of these tangible barriers. With the assistance of community leaders, extension agents, and local businesses, the program is on track to enhance the educational and personal growth opportunities 4-H offers.

How it Works

Prior to the start of the program, potential students are recommended by teachers, community leaders. After recommendations are received, needs assessments were conducted by county extension agents to determine if students qualified for the program. Once identified, information letters describing the purpose of the program were sent to parents for consent. Following the initial agreement from parents and students, a second assessment is conducted to determine what type of livestock would best fit each student's ability. Once students select the species of livestock they wish to show, the county agent serves as a liaison to ensure that proper care and maintenance of the animals is being completed by the students. The goal is for students to raise and show the animal at the [County] County Fair. Funds generated from the sale of animals are placed in a trust fund under the student's name. The funds are governed by a three signature system. Students receive the profit at the completion of high school and the entrance to a trade school, junior college, or university.

Educational Benefits

Students are required to attend monthly 4-H club meetings. Animal care, health, and nutritional needs of livestock are topics discussed. Students are also required to attend livestock showing practices that provides them with the opportunity to learn techniques of exhibiting livestock while gaining knowledge regarding shearing and fitting animals. Students are also required to be present at workshops offered at the county and district levels. The objective is to acquire more knowledge about 4-H and encourage other youth to develop an interest in agricultural education.

Results

During the first year, ten youth participated in the program. Because the program is in the beginning phases, the results of knowledge gained and change in attitude are difficult to determine. However, as the program progresses, students become more familiar with their projects. Students are attending meetings, livestock project clinics, and showmanship practices. Every student has been enthusiastic and eager to learn. The reward is witnessing students working with their families on a livestock project that would not have been possible without this program. At the conclusion of the program, the students will be required to complete a program questionnaire that will assist in evaluating their experience and improving the program.

Future Plans

The program is in the first of two years of operation. As the students progress with their livestock projects, there will be an effort to expand the youth's experiences to other aspects of the 4-H program. More specifically, the students will be recruited for leadership roles at the club level. The program will be evaluated at the conclusion of the second year for success and merit in [County] County. A needs assessment will be administered to determine if the 4-H program is effectively recruiting and maintaining underrepresented youth in the [County] County 4-H Program.

Costs/Resources Needed

The program operates on a $2000 fiscal budget provided through the [State] Agricultural Extension Service. Because many items were donated by outside resources, total operation cost is difficult to determine. A list of items needed and the source of donations is provided.

- Animals: Donations secured by the county extension agent. The donation of the animals is recorded with the local educational foundation. The foundation provides the donor with documentation for federal income tax reduction purposes.
- Feed Cost/Show Supplies: The county extension agent secured monetary donations to cover the cost of feed and show supplies from a local bank.
- Livestock Feed and Showing Supplies: The county extension agent facilitated collaboration with local feed stores to provide feed and supplies to the program, at cost to the store.
- Housing: The county extension agent coordinated with county's school district to utilize the high school agriculture farm to house animals in the program.

A local bank has agreed to fund the program in 2009-2010, however additional funds are always needed as veterinarian bills and unforeseen costs arise.

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Innovative Idea

Developing a Leadership Assessment Instrument for Cooperating Teachers

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Developing a Leadership Assessment Instrument for Cooperating Teachers

Introduction

For years the profession of Agricultural Education has been battling with a shortage of qualified teachers, Camp, Broyles & Skelton (2002). Researchers in the profession of Agricultural Education have often noted the impact of the cooperating teacher on the student teachers decision to enter the teaching profession *(Kitchel & Torres, 2007a).* In recent years, studies have been conducted in an effort to determine the leadership preference of the cooperating teacher and its impact when working with student teachers (Kitchel & Torres, 2007a; Kitchel & Torres, 2007b). There have also been studies to evaluate the effectiveness of the relationship of the cooperating and student teacher (Roberts, 2006; Young & Edwards, 2006).

The *National Research Agenda for Agricultural Education & Communication* (Osborne, n.d.) recognized the need to identify "what teaching, advising, and mentoring strategies most effectively and efficiently yield desired student outcomes with particular groups of students." (p. 7) In order to fill the many open positions each year, university teacher education programs need to effectively train student teachers and place them in cooperating teacher sites where they will build their confidence and hopefully make the decision to enter the teaching field. One way to facilitate this process is to ensure that cooperating teachers and student teachers are compatible in leader and follower style and preference.

Methodology

This descriptive study serves as step one in testing the reliability of a tool used to match student teachers and cooperating teachers. The population sample consisted of 20 purposively selected cooperating teachers who have hosted a student teacher within the past two years. The instrument used to assess the leadership preference of the cooperating teacher was the ELSI-AG (Educational Leadership Style Indicator – Agricultural Science Teacher Version). The ELSI-AG was developed by the research team and is based on Blanchard's Situational Leadership Theory (see Figure 1.).

The ELSI-AG was developed to determine the preferred leadership style of the cooperating teacher. It consists of 20 scenarios that may be encountered while working with a student teacher. Responses to each question are scored in one of four categories and respondents are labeled as a Director, Coach, Supporter or Delegator.

The instrument was reviewed by agricultural education professionals for face and content validity. Reliability was to be determined during the course of the study.
The instrument was delivered and returned online using Zoomerang. Data were analyzed using appropriate statistics within SPSS version 16.

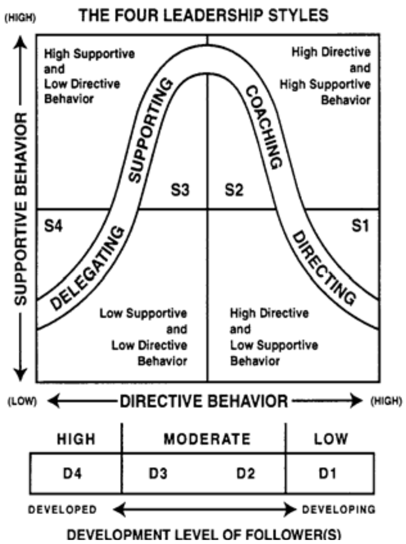

Figure 1. Blanchard's Leadership Styles and Follower Development.

Results to Date

All 20 participants responded by completing the ELSI-AG. It was determined that 5% preferred Directive leadership, 5% preferred the Coaching style, 90% preferred Supporting and none were primarily Delegators. Comments about the instrument itself included issues with question length, clarity and grammar. These have been corrected for the next round of testing.

Implications

Most cooperating teachers naturally fall into the Supporting category while we consider entry-level teachers to be in the D1 (low) category of follower development. Teachers want to support student teachers but results indicate they need direction to begin their experience. Teaching cooperating teachers to use correct situational leadership styles may lead to an an increase in agricultural education students who decide to enter the teaching profession.

Future Plans/Advice to Others

The researchers intend to continue testing and validating the instrument. A workshop is planned for the Fall 2010 semester to help cooperating teachers learn how to use their leadership styles to most effectively work with student teachers. An instrument is being designed to measure the follower development level of the student teacher.

Costs/Resources Needed

The instrument was developed and administered online. Costs were limited to labor and were minimal.

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Development of an Agricultural Mechanics Course for Preservice Teachers

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Development of an Agricultural Mechanics Course for Preservice Teachers

Introduction

Changes within post-secondary agricultural mechanization programs have led to a discontinuation of hands-on skill oriented courses in agricultural mechanics for preservice teachers (Burris, Robinson, and Terry, 2005). This has forced some teacher education programs to assume the task of providing instruction regarding technical content, laboratory management, and instructional methods in agricultural mechanics (Hubert & Leising, 2000; Johnson, Schumacher, & Stewart, 1990). In light of this national trend, _____________ University developed and offered a one credit hour workshop on methods for teaching agricultural mechanics in 2002.

The workshop was an interim step towards offering a permanent course to develop preservice teachers' agricultural mechanics competencies through hands-on instruction. The workshop was discontinued in 2003 and 2004. It was later revised and offered again in 2005 and 2006. The revised workshop only provided 16 hours of instruction. This did not reflect the importance of the needed skill sets. Due to a lack of equipment, no available laboratory site, and no available instructor within the department; the instruction for the workshop was done by an agriculture teacher at a local high school. Enrollment was voluntary. Students who chose to enroll in the workshop commuted six miles. This was done twice weekly during a four-week block prior to student teaching.

In 2006 the department entered into a collaborative agreement with the department of animal science, the ____________ farm, and ___________ University's research and demonstration farms. The agreement was made in order to build a new facility as a step towards developing a more permanent solution to address preservice agriculture teachers' instructional needs and to provide a central location to service the university's research and teaching farms. Land was donated by the _________ farm so that in 2007 a 5,760-square-foot building was constructed. Approximately 2,100-square-feet were dedicated as an agricultural mechanics teaching laboratory. This provided the foundation for an agricultural mechanics methods course to be included in the teacher education program. The development of the course is the focus of this poster.

Purpose

The purpose of this poster is to share our experiences in developing and implementing a course on methods for teaching agricultural mechanics for preservice agriculture teachers.

Procedures

- A graduate student with prior experience in teaching agricultural mechanics was recruited to pursue a doctorate in order to help coordinate instruction, develop curriculum, and to secure equipment and supplies for the course.

- Most of the equipment was donated by local secondary agricultural education programs and the departmental farm. Other pieces of equipment were purchased from retailers at an educational discount.

- An experimental course request placing emphasis on methods and management techniques for agricultural mechanics laboratories was submitted and approved by the department. Topics for the lecture component of the course included safety, management of students, instructional techniques, facility planning, and management of equipment and materials. The laboratory portion of the course focused on mechanical skills development in small engine technology, electricity, and welding as well as practice for teaching those skills.

- The course was approved to be included in the 2009-2011 University Catalog as a three credit hour course with one hour of lecture and six hours of lab per week The departmental curriculum committee included the course as a core agricultural science requirement for agriculture and life science education teacher certification majors.

- The course was taught for the first time in the fall of 2008. Classes met on Mondays from 1:10pm to 3:00pm and Wednesdays 1:10 to 4:00pm.

Results

- Preservice teachers received hands-on instruction that focused on technical content integrated with curriculum design, instructional planning, and laboratory management.

- Thirteen students participated in the fall of 2008, eight participated in spring of 2009, and 13 are enrolled for fall of 2009.

- Students gave high course evaluation ratings. Students supported the course and encouraged the continuation of the course with a similar format.

- Students were provided resources including safety information, skill sheets, and presentation notes via WebCT.

- Students developed an agricultural mechanics teaching portfolio which included lesson plans and laboratory management plans.

Future Plans

We plan to offer the course every semester. More skills will be included as equipment and funding are identified. An additional course will be developed and offered in the future

Resources Needed

A student fee was charged for purchasing consumable materials and supplies. Departmental funds were used to acquire additional equipment not donated by other educational institutions.

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Development of an Instrument to Measure the Agriscience Education Self-Efficacy of Middle School Students

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Development of an Instrument to Measure the Agriscience Education Self-Efficacy of Middle School Students

Introduction

Experts in the field of career development have devoted much attention to investigating the factors that predict career choices in science, technical, engineering, and math-related disciplines (Quimby, Seyala, & Wolfson, 2007). One reason for the increased attention has been the desire to investigate the factors responsible for the underrepresentation of women and minorities in the STEM career fields (Hackett, Betz, Caas, & Rocha-Smith, 1992; Lent et al., 2005 as cited in Quimby, Seyala, & Wolfson, 2005). Similarly, factors influencing the educational and career choices in the agricultural sciences, especially urban minorities, has also been a topic of interest in career and technical education research (see Esters & Bowen, 2004; Esters & Bowen, 2005; Jones & Larke, 2003; Talbert, 1996, 1997; White, Stewart, Linhardt, 1994). One of the weaknesses of these studies however, has been the lack of attention to students at the middle school level.

Theoretical Framework

This study was guided by Social Cognitive Career Theory (SCCT; Lent, Brown, & Hackett, 1994). Social cognitive career theory is anchored in Bandura's (1986) social cognitive theory and focuses on three cognitive-person variables: self-efficacy beliefs, outcome expectations, and personal goals. SCCT has successfully been applied to areas such as science, mathematics, and engineering (e.g., Lent et al., 2001; Lent, Brown, Brenner, Lyons, & Treistman, 2003; Lent, Lopez, Lopez, & Sheu, 2008); however, it is particularly critical to examine other domain areas if the SCCT model is to be applied generally across occupational areas (Smith & Fouad, 1999). Recently, Esters (2006, 2007) applied SCCT to the domain of agriculture through the development of the Agriscience Education Self-Efficacy Scale (AGESES; Esters & Luster, 2004). The AGESES was originally developed for use with high school students; recently however, a version was developed for use with middle school students (see Esters, 2008). Although evidence of reliability was presented in this study, details regarding the development and psychometric properties of the middle school version have not been examined. As such, the purpose of this study was to describe the development of a reliable and valid instrument measuring the agriscience education self-efficacy of middle school students.

Methods

Participants for this study were students enrolled in middle school agriscience education programs (n = 150). Fifty-six percent of participants were male and 44% were female. Participants' age ranged from 12 to 15 (M= 13.5.0, SD = .73). The instrument used to collect data for the study was the AGESES (Esters & Luster, 2004) which was modified for use with middle school students. The instrument is comprised of four sections measuring variables of the SCCT framework: (1) Agriculture Self-Efficacy

(AgSE), (2) Agriculture Outcome Expectations (AgOE), (3) Agriculture Goals/Intentions (AgGI), and (4) Agriculture Interests (AgInt). Development of the AGESES was based upon the guidelines set forth by Bandura (1995), Lent (2006), and Betz (2006) for measures based on social cognitive theory. An EFA using principal-axis factoring with an oblimin rotation was utilized. The number of factors to extract was determined by examining the scree plot, Eigen values greater than 1.0, and conceptual interpretability of the factors using a factor loading cutoff of .40.

Results

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of the AGESES were above .85 and Bartlett's test of sphericity was significant ($p < .001$) for each of the four sections indicating the suitability of the data for factor analysis (Tabachinik & Fidell, 2001). Examination for the pattern matrices revealed two-factor solutions for AgSE, AgOE, and AgInt; and a one-factor solution for AgGI. The two factor structure of AgSE, AgOE, and AgInt accounted for 65.72, 74.19, and 64.27 of the variance respectively. The one-factor structure for AgGI accounted for 75.72 of the variance. The AgOE factors were labeled Future Ag Outcomes and Personal Expectations. The AgGI factor was labeled Educational and Career Intentions. Because both the AgSE and AgInt factor solutions focused on animals and plants, the two factor solutions were labeled animal and plant efficacy; and animal and plant interests. All of the values of internal consistency reliability for the AgSE, AgOE, AgINt, and AgGI full scales and subscales were $\geq .77$.

Discussion

The purpose of this study was to describe the development of a valid and reliable instrument measuring the agriscience education self-efficacy of middle school students. Overall, findings indicate that the newly developed SCCT-based scales are a valid and reliable measure. Specifically, factor analysis revealed two-factor solutions of AgSE, AgOE, and AgInt; and a one-factor solution for AgGI. In sum, this study provides initial support for the Lent et al. (1994) SCCT model in occupational areas other than science, math, and engineering.

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Research

Effectiveness of Integrating Video Clips into the Secondary Agricultural Education Curriculum

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Effectiveness of Integrating Video Clips into the Secondary Agricultural Education Curriculum

Introduction/Need for Research

Secondary students today are considered members of the Millennial Generation (born in or after 1982). Members of this generation are quite different from previous generations because Millennials have grown up with media and technology and are naturally technology savvy (Kaiser Family Foundation, 2005). In a learning environment, members of this generation appreciate teamwork, experiential activities, structure, entertainment, and technology (Raines, 2002). When educating the Millennial Generation, McGlynn (2005) said more research is necessary to develop new teaching strategies, to adjust current practices, and to investigate how to effectively use technology to improve learning.

Researchers have studied the use of feature films to teach a number of concepts in a college setting. However, showing an entire feature film takes up a great deal of time and may not be realistic to meet course learning objectives. Roskos-Ewoldsen & Roskos-Ewoldsen (2001) found that using shorter video clips in an undergraduate psychology class helped students understand the concepts, made the concepts covered more realistic, and overall, made the course more enjoyable. However, few studies have examined the pedagogical effectiveness of using video clips (Roskos-Ewoldsen & Roskos-Ewoldsen, 2001).

The *National Research Agenda for Agricultural Education & Communication* (Osborne, n.d.) recognized the need to determine what instructional strategies improve student achievement in school-based agricultural education. The purpose of this study was to examine the effect of integrating video clips in the secondary agricultural education curriculum. The following research objectives were used to address this purpose: 1) To determine subjects' attitudes of integrating video clips into the agricultural education curriculum and 2) To determine subjects' satisfaction when video clips were used compared to when they were not.

Theoretical Framework

This study derived its theoretical framework from Bandura's (1986) social cognitive theory that states that learning can occur enactively or vicariously. Enactive learning involves actual doing and learning from one's own experience. Vicarious learning occurs when the learner does not overtly perform the behavior, but observes the behavior through other sources. Common sources for vicarious learning include observing or listening to individuals, symbolic representations (e.g., cartoon characters), printed materials (e.g. books), and electronic sources (e.g. television, videotape). Vicarious sources of information make learning more possible than if someone had to perform all the behaviors individually (Schunk, 2004). The integration of video clips into educational curriculum therefore provides a source for vicarious learning.

Methods and Procedures

This study used a quasi-experiment counterbalanced design in which all subjects receive the experimental treatment at some time during the experiment. This design is used with intact class groups to reduce any differences that exist between the groups (Ary, Jacobs, & Razavieh, 2002). Subjects were high school students enrolled in two sections of the same course, *Animal Science*, during the spring 2009 semester. Subjects were normally enrolled in these two sections and were not reassigned for this study. One section had seven students and the other section had 12 for a total of 19 subjects.

The treatment consisted of embedding video clips into two animal science units – horse and swine. The video clips were from a variety of television shows (such as *Dirty Jobs* and *Modern Marvels*) and online clips from YouTube and United Streaming. Each of the units was two-weeks in length and was similar in the nature and difficulty of the concepts. Each unit had the following lessons: industry, history, breeds, feeding, management, housing, tack (equipment), diseases and parasites. The horse unit included anatomy, selection, horsemanship and training while the swine unit included lessons on production systems and marketing.

The class section that was randomly assigned to receive the treatment for the first unit (Group 1) served as the control for the second unit (Group 2) and vice versa. The control group was taught the same content using more traditional methods and no additional video clips. Subjects completed a 15-item satisfaction instrument adapted from Brashears (2004) and Alexander (2007) at the end of each unit. Students who were in the class that received the video clip treatment also completed an instrument adapted from Roskos-Ewoldsen and Roskos-Ewoldsen (2001) to provide their opinions regarding the use of video clips. Finally, a series of demographic questions were asked to determine age, gender, year in school, and GPA.

Findings

Data were analyzed using SPSS 17.0 for Windows. Of the 19 subjects, 12 were male (63.2%) and the average age was 16.58 (SD = 1.07). Eleven of the subjects were sophomores (57.9%), 3 were juniors (15.8%), and 5 were seniors (26.3%). The average GPA was 3.17 (SD = .47).

Attitudes toward the use of video clips were measured using an 8-item Likert-type scale (1=strongly disagree, 5=strongly disagree) with post hoc reliability alpha coefficient of .928. The average score for video satisfaction was 4.05 (SD = .83). A dependent t-test found no significant difference in satisfaction when video clips were used (M = 3.95, SD = .77) and when they were not (M = 3.83, SD = .69), $t(18) = .926$, p value = .367, r = .71).

Conclusions

Students in the study were generally positive regarding the use of video clips in the two agricultural education curriculum units under investigation and agreed that video clips should be used in the future. However, there was not a significant difference in overall satisfaction between when video clips were used and when they were not.

Implications/Recommendations/Impact on Profession

The results of this study indicate that while students enjoyed the use of video clips in the agricultural education classroom, the use of video clips did not significantly impact overall attitudes of satisfaction regarding the class. It is recommended that the units be used again with larger classes to further examine the effect of integrating video clips on student satisfaction and academic achievement. It would also be beneficial to determine the current prevalence of video clips in school-based agricultural education including teacher’s reasons for adoption or barriers to integration.

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Innovative Idea

Enhancing Career Development Event Preparation Utilizing Jing™ Audio/Video Recordings

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Enhancing Career Development Event Preparation
Utilizing Jing™ Audio/Video Recordings

Need For Innovation/Idea

Jing™ is a free, downloadable program available from TechSmith (http://techsmith.com) that allows users to capture a picture or video and narrate what is seen on a computer screen. These short recordings can then be shared over the World Wide Web, through social networking sites or links to recordings can be placed in an email. Recordings can also be saved on a computer and viewed at anytime, without an Internet connection. This new technology has the capacity to engage, captivate, and increase the learning of students involved in FFA Career Development Events (CDE).

The current generation of high school students and FFA members are part of Generation NeXT, which includes students born after 1982. Taylor (2008) stated that these students are "digital natives" and "…technology is a part of most NeXter's identity" (p. 9). With this in mind, the use of Jing™, serves to feed this generations desire to use technology as an integral part of their social and educational lives.

Student participation in FFA Career Development Events (CDE) is an important part of the FFA experience. According to the National FFA Manual (2009), preparing for a CDE is preparing for the future (p.53). Whether an FFA member is presenting livestock judging reasons to a single judge or is reciting the FFA Creed to a room of 500 people, all of the National FFA 24 CDE events require public speaking skills and the process of acquiring these skills can be enhanced with Jing™. Instructor/coach and student preparation for participation is an extensive process that requires teams to dedicate a tremendous amount of time both after school and on the weekends preparing for CDE field days and events. The use of Jing™ can increase and enhance how students prepare and practice for CDE events by expediting the learning process and meeting their technological interests and needs. Besides being free, Jing™ is a very easy program to learn – requiring less than 30 minutes for most students to learn.

How It Works

Jing™ has been used over the past year by the author to engage students involved in judging teams, creed recitation, and extemporaneous public speaking. The instructor/coach for each of these activities created a series of narrations using the free Jing™ program. For livestock judging team members, groups of four photos of various types of livestock were placed into one Power Point™ slide and reasons for placement were recorded. To assist FFA Creed speakers, each paragraph of the creed was written out, again using a PowerPoint™ slide. The instructor then narrated each paragraph and created a screen capture recording. Similar methods were used for other judging teams. Links to all recordings were posted on the instructors' website and all judging team members and public speakers were provided instructions on accessing the provided links. Links were available to speakers so that they could listen and read at the same time to facilitate memorization of their presentation or enhance delivery methods and general speaking skills.

Extemporaneous and prepared public speakers utilized the Jing™ program in a reverse manner. Speakers either used the instructors' computer or their own computer at home to record either an extemporaneous presentation or their prepared speech. Extemporaneous speakers recorded their presentation over a screen capture of their topic while prepared speakers recorded over a screen capture of a picture that related to their presentation topic. Instructors and student speakers then listened to the recordings together, pausing at moments in the presentation where changes or improvements could be made. These listening/feedback sessions provided not only opportunities for critique but also the opportunity to commend speakers on exceptionally positive moments in their presentation. Recorded presentations were also used when team members or public speakers met as a group to discuss new links or critique individual recordings as a group.

Results To Date/Implications

Students on judging teams and public speakers were eager to investigate Jing™ recordings provided by the instructor to help jump start their preparation. Speakers and team members have been able to learn their speeches and reason delivery methods more effectively and in less time. As a result, less time is spent on delivery techniques and general public speaking skills during after school practice. After school time, typically set aside for learning the basics of delivery and technique, has now been able to be used for actual live practice. More time can now be dedicated to viewing and critiquing classes of livestock because students have been able to learn tone and power of voice while at home or in the school's computer lab. The implementation of Jing™ for FFA Career Development Event preparation has allowed increased practice time without burdening students and instructors.

Future Plans/Advice To Others

Future plans include using the Jing™ program extensively to provide numerous examples and practice narration recordings. Instructors also have plans to use the Jing™ program to record short subject matter lectures to reinforce information delivered in class. Links to recordings will be posted on a separate page of the instructors' website, which is separate and different from team/contest preparation recordings. Based on instructor experience, when utilizing Jing™, recordings should include simple screen captures that relate to the narration. A localized, student accessible website works best for posting recordings for team member and student use. Instructors involved in teaching at the secondary, college, and university level can use the program in ways that are unique and pertinent to their needs. The first-hand experiences shared reveal that there are immense benefits.

Costs/Resources Needed

Jing™ is a free, downloadable application available on the TechSmith website (http://techsmith.com), however, those seeking more capabilities can spend the minimal cost of upgrading to the Jing™ Plus program. The cost of a computer and a microphone would be additional costs to consider. However, school computer labs should be investigated for potential use to reduce departmental costs. The time requirement to learn to use Jing™ is minimal and time to create recordings varies based on the individual.

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(Innovative Idea)

Enhancing Pre-Service Teaching Advising by Adopting a Skills Inventory

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Enhancing Pre-Service Teaching Advising by Adopting a Skills Inventory

Introduction

The needs of student teachers have been the subject of considerable research in agricultural education (Edwards & Briers, 2001; Johnson, Lindhardt, & Stewart, 1989; Mundt & Connors, 1999; Talbert, Camp, & Heath-Camp, 1994). Fritz & Miller (2003) found student teachers were most concerned about self-adequacy, including subject matter competency. Similarly, Myers, Dyer, and Washburn (2005) suggested most needs and /or issues facing student teachers include classroom instruction. These findings suggest there may need a need to strengthen subject matter competency of pre-service teachers.

The confluence of university courses that lack skills training and the lack of practical agricultural experience of pre-service students have created teacher candidates that lack many of the fundamental skills they are required to teach. Student teachers commonly express they cannot teach a skill because they do not have adequate skills themselves. Additionally, cooperating teachers have indicated student teachers lack necessary skills.

To identify the scope of this problem, a "skills inventory" instrument was developed to assess the skills of the students in a pre-service program. While students come to pre-service programs with a variety of skills, they will undoubtedly gain additional skills while completing courses in the teacher preparation program. A skills inventory assessment may enhance advising of pre-service students and encourage student to seek courses and experiences that will strengthen their skill set before they begin teaching.

How it Works

The instrument was developed from a variety of sources including consultation with practicing secondary teachers, master teachers, post-secondary agricultural educators, and university teacher educators. The breakdown of courses taught at the secondary level was also used to determine the relative importance of each area. Data generated by state FFA officials indicate the greatest percentage of courses offered is in the areas of agriscience (34 %) and agricultural mechanics (29%). Other courses include plant science, including floral and ornamental horticulture (12%), "other" agriculture (10%), animal science (6%), agricultural business management (4%) and forestry/natural resources (1%).

An initial list of over 250 content specific skills was developed and pared to 172 items representing specific skills necessary to teach and supervise agricultural experiences. The selected skills represented the following areas: Agricultural Business/Information Technology; Agricultural Mechanics; Animal Science; Plant Science/Ornamental Horticulture/Floriculture; and Natural Resources. Emphasis was placed in proportion to the courses taught in the state.

A list of agricultural education majors was extracted from the campus data system, which was deemed to be a reliable source. Students were asked to complete an on-line survey instrument which characterized each skill into a scale of No prior knowledge, I have seen it done, I have done it, and I can teach it. An on-line survey instrument was also used to collect data from subject matter faculty to determine the extent of skills introduced in required subject matter competency courses. Faculty were asked the same items with a modified rating scale: I talk about it; I demonstrate it; My students do it. Students are invited by email to complete the online skills inventory and save their results for advising using the provided print option. Follow ups were made by email and in person by the agricultural faculty to increase the response rate.

Results

The initial survey of 56 students resulted in the completion of 45 instruments (80%). Class level breakdown included: seven freshman, six sophomores, 12 juniors, and 20 seniors. Mean scores were computed for each general area (see Table 1).

Table 1
Mean responses by subject area and class level

	Class Level				
Subject Area	1	2	3	4	All
Agricultural Business/Information Technology	3.0	3.1	3.2	3.3	3.2
Agricultural Mechanics	1.9	2.0	2.6	3.0	2.6
Animal Science	2.8	3.1	3.3	3.3	3.2
Plant Science/Ornamental Horticulture/Floriculture	1.7	2.4	2.8	2.8	2.6
Natural Resources	1.7	2.0	2.0	2.2	2.1
Total	2.2	2.4	2.8	3.0	2.8

Note: Likert Scale (1 = no prior knowledge; 2 = I have seen it; 3 = I have done it; 4 = I can teach it).

It must be noted that these samples are small for statistical analysis and the survey itself does not indicate which courses may have been completed at the time of completing the instrument. Areas of notable weakness were found across class levels in welding, landscape, floral, and natural resources management. Areas of strength for incoming students appear to be in information technology and animal science.

Mandatory advisement is required by the College of Agriculture and the Agricultural Education Department, which provided a venue for individual discussion of the instrument. During advising, the inventory was reviewed and faculty members made recommendations to "fill in the gaps" with directed work and internship courses, other subject matter courses, and summer employment.

Future Plans/Advice to Others

The long term goal of this project is to create a longitudinal study of student skills and to provide students the opportunity to assess their skills as they enter the program, either as freshmen or community college transfers. Students will be asked to complete the assessment as they begin their student teaching experience to evaluate their acquisition of skills while undergraduates. Data should also be used to tailor student teaching assignments to facilitate bridging gaps of necessary skills. Further data should be collected following student teaching to assess gaps in necessary skills prior to completion of student teaching. These data should be used to evaluate course requirements. Ultimately, long term research should provide evidence of increased teacher efficacy through carefully designed curriculum and student teacher placements.

Costs / Resources

The program has no direct cost beyond faculty instrument development and analysis time. The on-line survey is supported by software developed and supported by the College.

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Research

Exploring the Indicators of an Effective Agricultural Educators' Professional Development Event: The DELTA Conference

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Exploring the Indicators of an Effective Agricultural Educators' Professional Development Event: The DELTA Conference

Introduction/Need for Research

Preparing and providing an abundance of fully qualified and highly motivated agricultural educators at all levels is a priority initiative identified in the *National Research Agenda for Agricultural Education and Communication 2007-2010* (Osborne, n.d.). Studies have been conducted to determine the quality of various professional development events and their lasting effect on instructional practices (Fishman, Marx, Best, & Tal, 2003; Weeks, 2000). The purpose of this qualitative study was to explore the DELTA conference for the indicators of effective professional development. The DELTA conference is a professional development event, licensed by the National FFA Organization, conducted by teacher educators and education partners in California and Texas. Participants bring a content lesson with them and spend five days engaged in activities that incorporate theories of brain-based instruction (Caine & Caine, 1991), multiple intelligences (Gardner, 1983), cognitive domain (Bloom, Englehart, Furst, Hill, and Krathwohl, 1956), and modalities of learning (Bandler & Grinder, 1981) into the craft of teaching.

Conceptual Framework

Dunkin and Biddle (1974) proposed a model for teaching and learning that includes four variables: presage (the teacher), context (the student), process (the interaction of the student and teacher), and product (learning that occurs). Looking to affect student behaviors, schools have focused on influencing teacher behaviors through professional development events. The DELTA conference addresses both presage and process. Garet, Porter, Desimone, Birman, and Yoon (2001), drawing heavily on Dewey's (1938) postulate that experience is the key to all learning, found that professional development is of higher quality when sustained over time and involves a significant number of hours of engagement, ultimately leading to a change in teacher behavior. Their findings also revealed professional development that was both content focused and cohesive (connected with other professional development events, aligned with standards and assessments, and fostered professional communications) produced a higher level of changed practice (Garet et al., 2001).

Methodology

Using an emergent qualitative design, the researcher served as the primary data collection instrument (Merriam, 1998). As a participant-observer at the DELTA conference, the researcher documented her thoughts, emotional and physical reactions, observations of fellow participants, and the structure of the conference. Conference documents were collected for increased dependability. Following the conference and transcription of field notes, a member check was conducted to verify the perceptions and observations by fellow conference participants. The researcher coded the materials in an effort to identify patterns in events, personal responses, and participant interviews, always working toward deeper understanding of the emergent constructs.

Results/Findings

The study confirmed the findings of Garet et al. (2001). The researcher, verified by the participants, found the extended engagement to be beneficial to the overall effectiveness of the conference. By focusing on the pedagogical features of a content-based lesson they brought with them, it became easier for the researcher and the conference participants to integrate the teaching strategies that were the focus of the professional development event.

Unlike traditional workshop settings that last only a few hours, participants were immersed for 75 contact hours as they assumed the roles of student and teacher simultaneously. Physical practice of instructional behaviors and strategy applications allowed the researcher and fellow participants to examine their lessons under a microscope, dissect them, determine what failed to work, then practiced implementing strategies to repair problems. The conference provided an avenue for educators of all ages and experience to provide and receive immediate feedback with regards to implementation.

During the week, participants applied and practiced tested teaching strategies, were coached as techniques were implemented, and were provided immediate feedback to facilitate improvement. This is very different from the past experiences of professional development events where the focus centered completely on instructional content. Those past experiences lasted from one to six hours and left the researcher feeling that the time spent would never effect change in classroom practices.

Conclusions

Seventy-five contact hours, 30 educators, five facilitators, two teacher educators, and an environment that encouraged participants to take risks, provide professional support for peers, and to seek feedback while practicing implementation proved to be a catalyst for change in this researcher’s classroom. The indicators of effective professional development exist in the DELTA conference. There were extended engagement hours, the learning was active rather than passive absorption of information, and individual content expertise was utilized by having participants bring a lesson with them. DELTA related cohesively to personal experiences with professional development, aligned with standards and assessments, and fostered professional communication. According to Garet et al. (2001), these indicators lead to enhanced knowledge and skills as educators and will effect change in teaching practices. This change in practice leads to positive impacts on student learning, the ultimate goal of effective professional development (Garet et al., 2001).

Implications/Recommendations/Impact on Profession

The DELTA conference is a premier professional development event for affecting teacher practice. Providers of teacher professional development events should look to the DELTA conference as a model. In order to change teacher practice, it is necessary to increase the duration of engagement, provide educators with a safe environment to practice the learned instructional techniques, and create an environment that fosters professional communication. It is time to move away from the traditional workshop style of delivering professional development. If teachers are going to be required to spend hours of their time in a workshop, it is imperative that the time be well spent by addressing the content they already possess and establishing cohesion with prior and future professional development activities.

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Innovative Poster

Facebook in the Virtual Classroom

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Facebook in the Virtual Classroom

Introduction / Need for innovation or idea

The College of Agriculture and Life Sciences at Virginia Tech offers an online Masters degree in Agriculture and Life Sciences (MALS). The MALS program is designed for adults who would like to pursue a Master's degree while continuing to work full-time or fulfill other personal obligations. The MALS program allows students to work virtually; therefore the student reside around the country. The average age of MALS students is 36 with representation from diverse occupations including teaching, Extension, private industry, and government.

The courses generally use an online course delivery system such as Blackboard or Scholar to deliver educational content. In the summer of 2009, the program development and evaluation course added the use of Facebook, a social networking site, as an element of course delivery. Facebook was used in addition to Blackboard as a means of facilitating required weekly class discussions. The primary motivation for using Facebook was the lack of user-friendly discussion board options on Blackboard.

According to the Pew Internet & American Life Project, 35% of American adult internet users use social networking sites (Lenhart, 2009). In 2005, the percentage was 8%, demonstrating the growth in adult usage of social networking sites (SNS). Facebook accounts for 22% of adult social network users whereas 50% use MySpace, 6% use LinkedIn and another 13% use other sites such as BlackPlanet or Hi5. In addition to increasing numbers of adults using SNS, the frequency of use, as measured by visiting "yesterday", has increased from 2% in 2005 to 19% in 2008 (Lenhart, 2009).

Steps

The primary course management tool was Blackboard. Weekly lectures and assignments were posted on the Blackboard site but required discussion posts (minimum of 2 per week per student) which were conducted via Facebook. Prior to using Facebook, students were asked how they felt about the use of Facebook. No students (n=9) expressed objections to using the social networking site for scholarly discussions. After establishing consensus from students, the instructor took the following steps to introduce Facebook as a class tool:

- The instructor created a Facebook "group" requiring permission to join.
- Students were asked to establish a Facebook account if they did not have one.
- Students then requested to join the group. The instructor had to approve each group member.
- Joining the group did not give students access to other students Facebook pages if they were restricted.
- The initial post was a short biography with photo of each student and faculty member.
- Each week students were required to make one post on the weekly topic and reply at least once to someone else's post.

Implications

A mid-term course evaluation asked students their opinions' about the Facebook discussion board. Six students (67%) responded to the anonymous online evaluation survey. Five of the six respondents (83%) indicated that they liked the use of Facebook for class discussions. Typical responses include: "Again, I enjoy using Facebook as the discussion board. It's very convenient and makes things more personal. I definitely prefer Facebook to Blackboard." The student who did not like using Facebook stated, "I find Facebook to be very distracting and so I'd rather not use it for class discussion."

Future plans

Using Facebook as the discussion board platform for this course was overall, successful. The instructor and the majority of students found the discussion platform to be easier to follow than the Blackboard discussion platform. However there are important considerations before incorporating Facebook or other social networking sites into formal online classes. One important consideration is increased faculty time setting up an additional media for class and walking students through the process. It was assumed that students would have Facebook accounts and this was not, in fact, the case. Several students were new to Facebook but email communications between the student and instructor were sufficient for getting students started.

A second consideration is privacy. The course's Facebook group was established so that access to any posted information was available only with approval from the "administrator", in this case the instructor. Facebook users are able to set levels of access to their accounts. Most students set strict access to their accounts so that other students could not view their pages, only their class posts. Privacy did not become a problem for this relatively small group of graduate students but caution should be used when considering Facebook in other types of courses.

Costs/resources needed

One of the benefits of using Facebook is that there is no additional cost to incorporate Facebook into the online learning environment. Some research (Bugeja, 2006) has suggested that Facebook encourages distraction and multitasking rather than engaging students in the learning process. One student did remark that they found Facebook distracting but it did not seem to be a major issue in an asynchronous online environment. Other research indicates that Facebook can increase a students' sense of community and connection (Mack et al., 2007) which seemed to be the case in this course. The ability to see pictures of the instructor and other students and the biographical postings seemed to help increase class connectivity and community.

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FFA Professional Development Needs of Missouri Agricultural Educators

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Professional Development In-service Needs of [State] Agricultural Educators

Abstract

The National Research Agenda for Agricultural Education and Communication (Osborne, 2007) states that professional development for agricultural educators is key to improving teacher retention, program continuity, and the preparation of fully qualified and highly motivated agricultural educators. This research investigated the self-assessed, professional development needs of school-based agricultural educators in [State] using the direct assessment method. Census data were collected with questionnaires administered at area agricultural education teacher meetings and via an electronic questionnaire for those teachers who did not attend those meetings. Results indicated that teachers have the greatest in-service needs in the areas of: laboratory teaching, [State] agricultural operations, and agricultural mechanics technology. To improve the technical competence of these teachers, [State] agricultural educators should receive professional development in-service education in these areas. According to literature, [State] agricultural teacher educators and state agricultural education supervisory staff should develop these professional development in-service education programs and delivery them during technical workshops and summer conferences (Barrick, Ladewig, & Hedges, 1983; *Birkenholz & Harbstreit, 1987*; *[Authors] Funkenbusch, & Johnson, 2008).*

Introduction and Theoretical Framework

A century ago, school-based agricultural education programs focused on production agriculture with the ultimate goal of preparing students to return to the farm and pursue a career in agriculture (Leake, 1915). Stimson (as cited in Moore, 1988) stated that these programs consisted of classroom lecture, recitation, and manual labor. Over the years, agricultural education programs evolved considerably from production oriented training to consumption based curriculum and courses (Washburn & Dyer, 2006). Agricultural educators of today are faced with the growing challenge of providing a positive learning environment for students and preparing them for productive lives in a fast-paced world (Layfield & Dobbins, 2002). In addition they are encouraged to integrate science, reading, and mathematics curriculum into many of the agricultural education courses that they teach (Washburn & Dyer). The constant evolution of agricultural education programs and the addition of core subject content skills have required many teachers to seek professional development opportunities to meet the demands of the changing emphasis of their programs (Washburn & Dyer).

As the focus of school-based agricultural education programs have evolved, so has the need for professional development opportunities for agricultural educators. Operationally, the purpose of professional development is to provide educators the essential knowledge, skills and technical information required for them to effectively carry out their professional duties and meet the demands of a changing educational environment (Barrick, Ladewig, & Hedges, 1983; Birkenholz & Harbstreit, 1987; Nesbitt & Mundt, 1993; Washburn, King, Garton & Harbstreit, 2001). Historically, professional development has been one of the roles of collegiate agricultural education programs and state agricultural education supervisory staff (Barrick, et al.). The planning and implementation of these professional development opportunities has generally been developed with little input from educators in the field (Washburn, et al.) Traditionally, three predominate methods have been used by agricultural teacher educators and state supervisory staff to determine the in-service needs of agriculture educators: research (Layfield & Dobbins, 2000; Washburn, et al.), personal experiences (Barrick et al.), and informal inquiry with current agricultural educators (Barrick et al.; Roberts & Dyer, 2004).

According to Layfield and Dobbins (2002), a critical factor in developing successful teachers is correctly identifying professional development needs that are in the greatest demand. By understanding the problems faced by agricultural educators, university faculty and state agricultural education supervisory staff can improve professional development programs to address teachers' problems (Mundt & Connors, 1999). Literature suggests that providers of continuing education programs have experienced difficulties in identifying appropriate topics to include in professional development programs (Washburn, et al., 2001). To accomplish this goal, providers of professional development in-service education should monitor the needs of agriculture teachers over time and provide educational programs based upon their current needs (Birkenholz & Harbstreit, 1987). Garton and Chung (1995) concluded that "the in-service needs of agriculture teachers should be assessed and prioritized on a continual basis" (p. 78).

Waters and Haskell (1989) suggest that current educators be included in the process to identify contemporary professional development in-service needs of agriculture teachers. They stated that "gathering data from potential clientele and actively involving them in the process of identifying potential educational programs increases the likelihood of implementing relevant educational programs; thus, increasing the likelihood of achieving appropriate outcomes" (p. 26). Newcomb, McCracken, and Warmbrod (1993) agreed stating "individuals are more motivated to learn when they are actively involved in planning learning activities" (p. 32). In a 2005 study of New York agricultural science educators, researchers found that teachers believed professional development was most meaningful to them when it was personalized to their needs (Park, Moore & Rivera, 2007). When teachers felt engaged, they set their own learning expectations, became interested, and asserted themselves toward changing their teaching practices. By understanding the major problems facing school-based agriculture teachers, agricultural teacher education faculty at universities and state agricultural education supervisory staff can make improvements in the professional development in-service programs (Washburn & Dyer, 2006).

According to Witkin (1984), no one model or conceptual framework for needs assessment has been universally accepted. Therefore, little empirical evidence has proven one to be superior over another. He also stated that the educational needs of a group could be better evaluated by using a variety of needs assessment models. To guide this study, the researchers utilized Knowles' (1980) Theory of Andragogy as the theoretical base. This theory states that adults need to know why they need to learn something and become more motivated to learn when they see the need to learn. The theory further states that adults learn experientially, learn as problem solvers, and learn best when the topic is of immediate value to them. Knowles' stated that adults should be engaged in the planning of their own learning experiences. To measure the professional development in-service needs of [State] agriculture teachers, the researchers utilized a direct assessment instrument. According to literature, direct assessment models have been used by many researchers to determine the in-service needs of agriculture teachers (Birkenholz & Harbstreit, 1987; Briers & Edwards, 1998).

Nine years have elapsed since the last comprehensive study of professional development in-service needs of [State] agricultural educators. In previous studies, researchers found that [State] agricultural educators had in-service needs in the following areas: developing agribusiness management skills, electricity skills, training FFA contest teams, assisting students with SOEP records, completing reports for local and state administrators, motivating students to learn, developing an effective public relations program, preparing proficiency award applications, use of computers, writing grant proposals, attracting quality students, bio-technology applications, and landscaping (Birkenholz & Harbstreit, 1987; Garton & Chung, 1996; King & Garton, 2000). Due to the length of time since those studies were conducted and the continual need for research regarding the professional development in-service needs of agricultural educators (Osborne, 2007), an assessment of current professional development needs of agriculture teachers was warranted.

Purpose and Research Questions

The purpose of this study was to identify the professional development in-service needs of [State] agricultural educators. The following research questions were investigated to accomplish this purpose:

1. What are the personal and professional characteristics (years of teaching experience, agricultural education district, agricultural education area, sex, FFA membership, 4-H membership, type of teacher certification, major in bachelor's degree, minor in bachelor's degree) of school-based agricultural educators in [State]?

2. What are the professional development in-service needs of school-based agricultural educators in [State] related to selected competencies including: curriculum and instruction, technical agriculture teaching topics, student and teacher development, and program management and planning?

Procedures

Population

The population for this study was all school-based agricultural education teachers in [State] (N = 467). Subjects were identified from the 2008-2009 [State] Agricultural Education Directory (2008) and confirmed by the agricultural education professional development staff of the [State Department of Education] [Name], personal communication, September 1, 2008). Through this process, 467 teachers were identified as members of the population.

Methodology

The data collection instrument developed by Garton and Chung (1995) was modified for use with this study. The instrument contained two sections. The first section was composed of items describing competencies associated with teaching school-based agricultural education. Those competencies were organized into five constructs: curriculum and instruction, preparing a team for career development events, program management and planning, student and teacher development, and technical agriculture teaching topics. Competencies were identified through a review of relevant literature and from input of a panel of experts. The panel of experts was composed of three university faculty members with expertise in agricultural education, four agricultural education graduate students with prior school-based agricultural education teaching experience, a professional development specialist from the agricultural education division of the [State department of education] and a university faculty member with expertise in research methods and data collection instrument design. Response choices for each item were the following five-point, anchored, Likert-type scale: 0 = no need, 1 = little need, 2 = some need, 3 = much need, and 4 = highest need. The second section of the instrument was designed to collect data related to selected personal and professional demographic characteristics of the respondents. Characteristics investigated were: years of teaching experience, agricultural education district location, agricultural education area location, sex, FFA membership, 4-H membership, type of teacher certification, major in bachelor's degree, and minor in bachelor's degree.

The panel of experts described above was also utilized to determine the face and content validity of the instrument. After implementation of suggestions provided by the panel, the instrument was judged to be valid. A pilot test was conducted to determine the reliability of the instrument. The pilot test group was composed of 20 experienced school-based agricultural education teachers from [State] who served as mentors in a mentor/inductee program for first and second year agricultural education teachers. Due to their participation in the pilot study, these teachers were excluded from the census. Cronbach's alpha (Cronbach, 1951) was used to measure the reliability of the instrument using data collected from the pilot group. Cronbach's alpha was calculated for each construct in the study yielding the following results: Curriculum and Instruction (.94), Preparing a Team for Career Development Events (.90), Program Management and Planning (.95), Student and Teacher Development (.90), and Technical Agriculture Teaching Topics (.87). These alpha levels were deemed to be acceptable indicators of instrument reliability (Nunnally & Burnstein, 1994).

After the validity and reliability of the instrument were established, the instrument was administered to the population. A census was conducted of all [State] agricultural educators, excluding the pilot group. The questionnaire was administered at each of the 16 area agricultural education teacher meetings held in September and October of 2008. This stage of data collection resulted in 310 acceptably completed questionnaires, yielding a 69.35% response rate. A second round of data collection was conducted to gather data from teachers who did not attend one of the area meetings. An online version of the instrument was utilized in this second stage of data collection and yielded responses from an additional 73 respondents or 16.33% of the population. The response rate resulting from the two stages of data collection was 85.68%.

Data Analysis

Data relative to all research questions were analyzed utilizing SPSS 16.0 or Microsoft Excel. Descriptive statistics were calculated for all professional development competencies and demographic characteristics. For research question one, the mean, standard deviation, and range were calculated for the demographic characteristic years of teaching experience. Frequency and percentage were calculated for the remaining demographic characteristics. For research question two, means, standard deviations, and overall rank of in-service need were calculated for each professional development competency. The following anchors were used to describe the means for in-service need: no need = 0.00 – 0.50; little need = 0.51 – 1.50; some need = 1.51 – 2.50; much need = 2.51 – 3.50; highest need = 3.51 – 4.00. Additionally, a grand mean was calculated for each construct using the mean from each competency.

Findings

Findings Associated with Objective 1

The average years of teaching experience for [State] agricultural educators who participated in this study was slightly more than 10 (M = 10.14; SD = 8.29), with a range of experience from 1 year to 38 years. The district with the most respondents was the Central District (n = 85; 22.20%). More respondents were from schools in Area 8 (n = 33; 8.60%) than from any of the other 15 areas. The district with the fewest respondents, compared to the other five districts, was the Southeast District (n = 35; 9.10%). The area with the fewest respondents was Area 12 (n =16; 4.20%). More than 70 % (n = 272; 71.01%) of the agricultural educators who participated in this study were male.

A total of 339 (88.50%) [State] agricultural educators reported that they had been a member of the National FFA Organization. In addition, 222 (58.00%) of the respondents reported that they had been a 4-H member as a youth. Nearly 9 out of 10 (n = 340; 88.80%) of [State] agricultural educators reported that they had a traditional agriculture teacher certification while only 7.80% (n = 30) hold an alternative agriculture teacher certification. The remaining 30 (3.40%) failed to designate the type of certification that they possess.

Table 1 displays the undergraduate degree majors held by [State] agricultural educators. More than three quarters (293), of the respondents reported that their undergraduate degree major was agricultural education. As shown in Table 2, more than 40% of the respondents reported that they did not have an undergraduate degree minor.

Table 1
Undergraduate Degree Majors of [State] Secondary Agricultural Educators (n = 383*)*

Area	*f*	%
Agricultural Education	293	76.50
Other	21	5.50
Missing	18	4.70
Animal Science	17	4.40
Agricultural Business	9	2.30
Agronomy	8	2.10
Animal Nutrition	6	1.60
Agricultural Economics	4	1.00
Agricultural Systems Management	4	1.00
Horticulture	3	0.80

Table 2
Undergraduate Degree Minors of [State] Secondary Agricultural Educators (n = 383*)*

Area	*f*	%
None	156	40.70
Missing	62	16.20
Agricultural Economics	44	11.50
Animal Science	25	6.50
Other	22	5.70
Agricultural Business	18	4.70
Agricultural Education	18	4.70
Agronomy	11	2.90
Plant Science	10	2.60
Animal Nutrition	7	1.80
Agricultural Systems Management	4	1.00
Horticulture	4	1.00
Forestry	1	0.30
Turfgrass Management	1	0.30

Findings Associated with Objective 2

Alkin (1974) stated that "curriculum consists of the intended learning outcome; the results or the ends of an instructional activity" (p. 43). He described instruction as "the planning and implementation of appropriate strategies for curricular components" (p. 44). The researchers utilized Alkin's definition of curriculum and instruction to describe the construct "Curriculum and Instruction" investigated in this study. The grand mean for this construct was 2.26, indicating that teachers perceived some need for professional development in-service for this group of competencies. The most highly ranked competency in this construct was "Laboratory teaching practices" (M = 2.58). In fact, that competency ranked highest among the 66 competencies investigated. As shown in Table 3, teachers indicated some need for in-service education for the remaining 10 items in this construct that included topics such as: “Motivating student learning” (*M* = 2.40), “Integrating science into the agriculture curriculum” (*M* = 2.31), “Teaching student personal finance” (*M* = 2.17), and “Teaching decision-making skills” (*M* = 2.07). The competency with the least need for in-service education in this construct was the competency “Managing student behavior” with a mean of 1.80.

Table 3
Teachers’ Self-Perceived Need for In-Service for Competencies Associated with Curriculum and Instruction

Competencies	*M*	*SD*	Overall Rank
Laboratory teaching practices	2.58	0.84	1
Designing curriculum to attract students	2.48	0.91	6
Motivating student learning	2.40	0.96	10
Online teaching resources	2.39	0.96	12
Integrating science into the agriculture curriculum	2.31	1.00	17
Management of instructional facilities (e.g. agricultural mechanics, horticulture)	2.28	0.94	21
Designing courses for alternative credit	2.27	1.09	22
Teaching student personal finance	2.17	0.96	35
Classroom teaching practices	2.15	0.77	36
Teaching decision-making skills	2.07	0.83	46
Managing student behavior	1.80	0.97	60
Grand mean	2.26		

Note. Scale: no need: 0.00 – 0.50; little need = 0.51 – 1.50; some need = 1.51 – 2.50; much need = 2.51 – 3.50; highest need = 3.51 – 4.00.

The construct “Student and Teacher Development” was operationally defined as skills and techniques used and acquired by agricultural educators to accomplish the daily tasks of their position. The grand mean for the construct Student and Teacher Development was 2.21, indicating that teachers perceived some need for professional development in this construct. As shown in Table 4, the competency “Tours of [State] agriculture” was ranked as the highest in-service education need (*M* = 2.54) among 11 items included in this construct and was the only item for which teachers indicated much need for in-service education. Of the remaining 10 competencies, respondents rated them as having some need for in-service education. Examples of other competencies included in this construct were “Developing SAE opportunities” (*M* = 2.43), “Conducting successful FFA chapter activities” (*M* = 2.28), and “Managing work related stress” (*M* = 2.20). With each having a mean of 1.92, the competencies “Food for America programs” and “Supervising traditional SAE programs” tied as the lowest ranked competencies for in-service education in this construct (*M* = 1.92).

Table 4
Teachers' Self-Perceived Need for In-Service for Competencies Associated with Student and Teacher Development

Competency	*M*	*SD*	Overall Rank
Tours of [State] agriculture	2.54	1.11	2
Tours of American agriculture (other than [State])	2.44	1.14	8
Developing SAE opportunities for students	2.43	0.95	9
Conducting successful FFA chapter activities	2.28	1.01	21
Preparing FFA awards/ degree applications	2.24	1.04	28
Supervising non-traditional SAE programs	2.24	1.04	28
Managing work related stress	2.20	1.09	33
Time management (tips and techniques)	2.10	1.03	43
Organizing a FFA Alumni association	2.00	1.10	49
Food for America programs	1.92	0.99	55
Supervising traditional SAE programs	1.92	1.00	55
Grand mean	2.21		

Note. Scale: no need: 0.00 – 0.50; little need = 0.51 – 1.50; some need = 1.51 – 2.50; much need = 2.51 – 3.50; highest need = 3.51 – 4.00.

The construct category "Program Management and Planning" was operationally defined as skills needed by [State] agricultural educators to plan, manage, maintain, and improve the local agricultural education/FFA program. The grand mean for this construct was 1.89, indicating teachers perceived some need for professional development education. In this construct, the competency "Writing grant proposals for external funding" was the highest ranked in-service education need (*M* = 2.47). Overall, respondents rated 14 out of 16 competencies as having some need for in-service education. These competencies included such topics as "Improving the image of your agriculture program" (*M* = 2.33), "Completing reports for administrators" (*M* = 1.89), and "Establishing an adult agriculture education program" (*M* = 1.79). The competency with the least need for in-service education in this construct was "Effective use of block scheduling" (*M* = 1.23). Table 5 displays the data related to these findings.

Table 5
Teachers' Self-Perceived Need for In-Service for Competencies Associated with Program Management and Planning

Competency	*M*	*SD*	Overall Rank
Writing grant proposals for external funding	2.47	1.16	7
Improving the image of your agriculture program	2.33	1.01	14
Creating a FFA chapter website	2.32	1.17	15
Utilizing a local advisory committee	2.09	1.10	44
Developing business/community relations	1.99	0.99	50
Using online FFA resources	1.99	1.04	50
Evaluating the local agriculture education program	1.95	0.94	53
Establishing a working relationship with local media	1.95	1.02	53
Completing reports for administrators	1.89	1.02	58
Middle school classes	1.81	1.09	59
Establishing an adult agriculture education program	1.79	1.15	61
Maintaining a school land lab	1.70	1.26	62
Organizing a local FBMA (Farm Business Management Analysis) program	1.51	1.10	63
Recruiting for Young Farmers/Young Farm Wives	1.42	1.22	64
Effective use of block scheduling	1.23	1.23	65
Grand mean	1.89		

Note. Scale: no need: 0.00 – 0.50; little need = 0.51 – 1.50; some need = 1.51 – 2.50; much need = 2.51 – 3.50; highest need = 3.51 – 4.00.

The construct "Technical Agriculture Teaching Topics" was operationally defined as technical agricultural subject matter that is taught by teachers in [State] agricultural education classes. As shown in Table 6, the grand mean for this construct was 2.22, meaning teachers perceived some need for in-service education in this area. "Global Positioning Systems (GPS)" ranked as the highest in-service education need in the construct (*M* = 2.54). Teachers rated 3 of the 26 items in this group to be topics in which they have much need for professional development. All other items, which included such varied topics as "Agricultural structures" (*M* = 2.40), "Genetic engineering" (*M* = 2.29), "Show animals" (*M* = 2.11), and "Floral design" (*M* = 2.02), were rated as topics that teachers need some in-service education. The competency "Companion animal care" ranked as the lowest in-service education need in this construct (*M* = 1.91).

Table 6
Teachers' Self-Perceived Need for In-Service for Competencies Associated with Technical Agriculture Teaching Topics

Competency	*M*	*SD*	Overall Rank
Global Positioning Systems (GPS)	2.54	1.04	2
Bio-Fuels	2.53	1.01	4
Biotechnology	2.51	0.99	5
Agricultural structures	2.40	1.09	10
Agricultural mechanics project construction	2.36	1.09	13
Animal reproduction	2.32	1.00	15
Veterinarian assistant training	2.30	1.13	18
Leadership development	2.29	1.00	19
Genetic Engineering	2.29	1.05	19
Natural resource management	2.27	0.99	22
Landscaping	2.27	1.00	22
Renewable energy sources	2.27	1.07	22
Food science	2.25	1.07	27
Greenhouse management	2.24	1.06	28
Electricity	2.23	1.04	31
Small engine technology	2.22	1.11	32
Alternative animal production	2.19	1.01	34
Tractor restoration	2.15	1.24	36
Agricultural communications	2.14	0.92	38
Record keeping skills	2.14	1.02	38
Animal nutrition	2.13	0.89	40
Show animals	2.11	1.09	41
Hot metal work	2.11	1.13	41
Cold metal work	2.09	1.14	44
Floral design	2.02	1.07	47
Plumbing	2.01	1.07	48
Tissue culture	1.99	1.15	50
Companion animal care	1.91	1.09	57
Grand mean	2.22		

Note. Scale: no need: 0.00 – 0.50; little need = 0.51 – 1.50; some need = 1.51 – 2.50; much need = 2.51 – 3.50; highest need = 3.51 – 4.00.

Conclusions, Implications, and Recommendations

Research Question # 1

The typical school-based agricultural educator in [State] is a male with 10 years of teaching experience. He teaches at a school located in the Central agricultural education district and the Area 8 agricultural education area. As a youth, he was a member of the National FFA Organization and 4-H. In addition, he holds a traditional teacher certification in agriculture and a bachelor's degree in agricultural education. The characteristics of the respondents along with factors such as: location, length of time, time of year, cost, graduate school credit, and use of distance education technology (synchronous and asynchronous) should be considered in developing professional development programs for agriculture teachers.

Research Question # 2

[State] agricultural educators have the greatest professional development in-service needs in the construct areas of Curriculum and Instruction, Technical Agriculture Teaching Topics, and Student and Teacher Development. Current trends and emerging opportunities related to these general areas should be the focus of in-service education programs for teachers in this state.

The five specific topics in which teachers have the greatest need for continuing education are:

- Laboratory teaching practices
- Global Positioning Systems (GPS)
- Touring [State] agricultural operations
- Bio-fuels
- Bio-technology

A research based professional development program will result in "an abundance of fully qualified and highly motivated agricultural educators at all levels" (Osborne, 2007, p.20). Based upon the conclusions of this research, several implications must be considered:

1. Interestingly, three of the top five professional development needs identified in this study relate to the [State], school-based agricultural mechanics curriculum. Why do teachers feel such a need for professional development related to agricultural mechanics? Has this field of the curriculum moved to areas in which teachers have no previous experience? Is the current curriculum different from what teachers learned during their pre-service education? Have too few in-service programs related to agricultural mechanics been offered in recent years?

2. McMahon (1975) and Strong (1975) suggest that the primary responsibility of the teacher is to provide safety instruction and a safe learning environment for students working in an agricultural education laboratory. However, several studies have indicated that voids exist in teacher preparation programs in the area of laboratory safety (Forsythe, 1983; Jarrett,

1967; Rosencrans, 1996). If teaching in a laboratory is one of the fundamental teaching methods used in all aspects of school-based agricultural education (animal science, horticulture, agricultural mechanics, food science, etc.), what efforts are being made by teacher education programs to prepare future teachers for this critical task?

In the past, so called “travel courses” where commonly offered as graduate courses at universities in [State]. For a variety of reasons, such opportunities no longer exist. Is there sufficient teacher interest, in this type of professional development program that involves tours, to pay the extra fees required to make them possible? Could the interests and needs associated with such programs be met through virtual tours, such as videos made available online?

According the National Research Agenda for Agricultural Education and Communication, “well designed professional development experiences, based upon teacher career stage, may improve teacher retention and program continuity” (p. 20.). Additionally, “practicing teachers must have continuing access to high quality professional development programs” (Osborne, 2007, p. 20). Acknowledging the work of Osborne and others (Barrick et al., 1983; Birkenholz & Harbstreit, 1987; [Author] et al., 2008), it is recommended that studies similar to this one be conducted periodically to ensure the continuing education needs of teachers are met. Recognizing that knowledge and technology related to agriculture is constantly evolving and the average years of experience of [State] agriculture teachers is only 10 years, the researchers recommend that a comprehensive assessment of professional development needs be conducted every five years.

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Innovative Poster

Food for Thought Curriculum: An Innovative, Collaborative Agricultural Literacy Project

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Food for Thought Curriculum: An Innovative, Collaborative Agricultural Literacy Project

Introduction

American agriculture feeds and clothes the world, yet many consumers are unaware of where their food comes from and the impact of agriculture on their daily lives (National Research Council, 1988). The agricultural literacy movement has devoted considerable effort to increase the visibility of agriculture in schools through enhancement of K-12 curriculum. However, many of the efforts have met resistance due to the increased focus on standardization and state testing. The Food for Thought curriculum was designed to address this concern and is aligned with state educational standards.

A pressing issue in American education is the need for increased reading instruction in schools. The National Institute for Literacy states that there are five components of reading; phonemic awareness, phonics, fluency, vocabulary and comprehension (National Institute for Literacy, 2009). Content area reading strategies can enhance reading instruction and enable students to attain a higher degree of literacy (Park & Osborne, 2006). The aim of the Food for Thought curriculum is to promote content area reading in science, social studies, and agricultural sciences.

Innovation

A need exists for an economical, effective and dynamic curriculum. One that is portable, easy to use, and available to everyone. Recently, the College of Agricultural Sciences along with the Departments of Agricultural Education and Extension and Experiment Station Communications developed an innovative curriculum design and delivery model. The Food for Thought curriculum is intended to be an open, adaptive and collaborative system where teachers in any subject can promote reading, improve agricultural literacy and increase the science, social studies, and language arts skills of all students.

The Food for Thought curriculum is available without cost and is directly linked to individual articles contained in the Oregon's Agricultural Progress magazine. The Oregon Agricultural Progress magazine is disseminated throughout Oregon to over 10,000 subscribers. Through an innovative design, teachers from throughout the state are supplied copies of the publication and then are able to access lesson plans directly linked to each article. The curriculum is a set of 20 individual lessons designed to provide teachers with creative, learner-centered teaching activities to improve fluency, vocabulary, comprehension, and the understanding of agriculture. The lessons are designed to be integrated into existing school-based curriculum and target middle and high school students. The uniqueness of having 20 individual lessons, directly connected to colorful and insightful magazine articles, provides teachers the freedom to integrate relevant and compelling agricultural content into their existing curriculum.

Program Design

The Food for Thought curriculum was designed in conjunction with the Fall 2009 issue of Oregon's Agricultural Progress magazine. Concurrent with the distribution of the magazine, teachers within the state were notified of the available curriculum and sent a link to the Food for Thought curriculum. This initial offering was intended as a pilot project to provide input as to the usability and sustainability of the Food for Thought curriculum. The intent of the creators was to determine future development based on feedback from the initial audiences.

In terms of curricular design, the materials were developed primarily through the dedicated efforts of a student enrolled in agricultural education and a faculty member within the department of Extension and Experiment Station Communications (EESC). Support for both the technical and graphic aspects of the project was provided through a joint collaboration between EESC and Agricultural Education. Collaboration was a critical element in the creation of this curriculum and constitutes a key aspect of program design.

Results

The special issue of Oregon's Agricultural Progress magazine has been distributed to over 10,000 individuals and several thousand additional copies were allocated for distribution to schools. The online lessons and related articles were also promoted through the Agriculture in the Classroom Foundation. The creators of the curriculum are monitoring dissemination of materials through online click-counts and eliciting feedback from target audiences through e-mail, telephone calls and face-to-face contact. The Food for Thought curriculum has received positive feedback from teachers. Formal data will continue to be collected in order to further develop the curriculum for a wider audience.

Future plans

The creators are optimistic regarding the continued use of the Food for Thought curriculum and the integration of agricultural content within area schools. One of the benefits of this project is the open availability of both the curriculum and an electronic version of the Oregon Agricultural Progress magazine. Once the awareness increases, educators external to the state and region will have open access to informative and well-developed agricultural lessons. The continued focus on innovative ways to facilitate open access curriculum and the dissemination of research-based agricultural information provide the keys for continued success of both agricultural education and the land grant system.

Costs

The costs of this project were minimal due to existing infrastructure and active collaboration. The primary expense was the wages of the project development team. The creators estimate that the agricultural education student spent approximately 200 hours with 40 hours of support from the magazine editor. Production of the curriculum in an electronic format eliminated any printing and mailing costs.

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Poster Type: Innovate Idea

Getting Their Feet Wet: Children's Water Festival Presentations as a Field Experience Component

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Getting Their Feet Wet: Children's Water Festival Presentations as a Field Experience Component

Introduction/Need for Innovation

For pre-service teachers, the early field experience holds an important place in teacher education programs. Pre-student teaching field experiences help future teachers better understand the classroom environment, build confidence, and appreciate the various roles teachers play (Arnett & Freeburg, 2008). According to the National Standards for Teacher Education in Agriculture (AAAE, 2001), field experiences should be high quality, well planned, and sequential. Pre-service teachers in the agricultural education department at the University of Wisconsin-River Falls (UWRF) complete 120 hours of early field experience prior to student teaching. Their exposure to middle-school age students is limited because of a lack of middle school courses in the agriculture programs near campus.

Presenting at an area water festival provides an alternative early field experience activity working with middle school students. “A water festival is typically a one-day event organized to educate a large number of students from several schools about water resources” ("Children's Water Festivals", n.d., para.1). The Chisago Children's Water Festival provides hands-on water resources education to nearly 750 fifth-grade students in September each year. In the fall of 2007, the organizers of the Chisago County Water Festival invited students from the UWRF agricultural education department to present at the festival. Participation in service learning activities like this helps students learn both disciplinary knowledge and civic knowledge (Robinson & Torres, 2007). The festival provided an opportunity to build teaching knowledge while supporting the community.

How It Works

Students enrolled in the AGED 201 Program Delivery in Agricultural, Extension, and Leadership Education and TED 440 Techniques in Agriculture courses present at the festival. Students first attend an evening training session provided by the Minnesota Project WET coordinator. Student groups of 2-3 are then assigned to each of the activity stations. Each group then prepares an instructional plan. The festival coordinators provide the basic materials, but the students need to clarify the learning outcomes and develop introductions. For students enrolled in AGED 201 this field experience is their first opportunity to write and present a lesson.

On the day of the festival, each student group presents four to six times to classroom sized groups of fifth-graders. The festival coordinators provide all materials. Unlike many classroom-based field experiences, students teach and reflect on the same lesson numerous times throughout the day. After the day is complete, students submit a reflection paper based on the entire experience. In 2009 the UWRF students also had the opportunity to attend a second on-campus session to complete the Project WET training and receive the full curriculum guide.

Results to Date

Since the partnership began in September 2007, 85 UWRF students have presented at the festival. The number participating has increased steadily each year. The event has been very popular with the UWRF students and several volunteer each year even though they are not enrolled in the affiliated courses. The festival organizers also recognize the value of university student participation. Jerry Spetzman, Water Resource Manager with the Chisago County Department of Environmental Services and Zoning, stated "I believe that the River Falls student participation in the Festival is a major reason the festival is a success" (personal communication, September 10, 2009). In 2009, 41 students completed the full Project WET training and received the Project WET curriculum.

Future Plans/Advice to Others

The department plans to continue involvement with the Chisago Children's Water Festival. It provides a win-win situation for the pre-service teachers and the fifth-grade students. The chance to teach, reflect, revise, and repeat rarely occurs in other early field experience settings. Other agricultural education teacher preparation programs are encouraged to seek out similar activities. The partnership supports pre-service teacher development and community relations.

Costs/Resources Needed

The UWRF agricultural education department has not incurred any financial cost due to this partnership. The festival organizers cover the costs for all materials used during the training and festival presentations. They have also been able to cover the cost of transportation by providing $10 per student to support those who drive to the event. In 2009 the fee for the Project WET curriculum and training was also provided.

While not essential, having the Project WET Coordinator provide training also benefits the pre-service teachers who participate. It exposes students to another facilitation style. Tips for how to approach each activity, what to look out for, and suggestions for involving adult chaperones help students write better instructional plans and deliver high-quality presentations at the festival.

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Research Poster

How are Students Thinking Critically? Measuring the Difference between Seeking Information and Engagement

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How are Students Thinking Critically? Measuring the Difference between Seeking Information and Engagement

Introduction/Need for Research

The ability to think critically has been repeatedly identified as a cognitive style necessary for students in the 21st century (Myers & Dyer, 2006). Critical thinking ability is essential to our students' success because it represents their ability to deal with decisions faced every day (Torres & Cano, 1995). However, this ability is constantly changing as students learn and grow and is therefore extremely difficult to measure. By using critical thinking dispositions, which Irani et al. (2007) have identified as "the gateway through which one allows the mind to engage in critical thinking activity," (p. 2) a deeper, slowly changing preference rather than ability becomes the unit of measurement. These dispositions are measurements agricultural educators can use when assessing students and creating educational curriculum. Improving the success of students enrolled in agricultural and life sciences academic and technical programs is part of the National Research Agenda: Agricultural Education and Communication, 2007-2010 (Osborne, n.d.), therefore a study designed to create an instrument which can be used to improve student learning can yield valuable data providing direction for future practice and research.

Conceptual or Theoretical Framework

Critical thinking has long been recognized as one of the most important cognitive traits influencing an individual's success (Myers & Dyer, 2006; Torres & Cano, 1995). Facione (1990) was the first to attempt to describe dispositions as they pertain to critical thinking by conducting a Delphi study using top researchers in the field. Seven separate dispositions were identified (Facione). While conducting a factor analysis of the California critical thinking disposition inventory, Moore, Rudd, and Penfield (2002) found more factors than previously identified by Facione in 1990. In an attempt to more accurately and parsimoniously measure critical thinking disposition, Irani et al. (2007) used the Delphi study results and a review of literature in the field of critical thinking to create a new instrument, the UF-EMI. The UF-EMI uses three constructs to describe an individual's critical thinking disposition. While the UF-EMI has a sound base in critical thinking literature, instruments with multiple constructs have not been found as useful as those utilizing a continuum (Spector, Van Katwyk, Brannick, & Chen, 1997). The purpose of this study was to develop a reliable critical thinking instrument displaying disposition on a continuum.

Methodology

With permission, the UF-EMI was adapted to create a new critical thinking instrument measuring critical thinking disposition on a continuum between the individual's willingness to engage internally and their interest in seeking out information when thinking critically. Data collected using the original UF-EMI was examined to identify items exhibiting colinearity. As a result, 22 of the original 26 items included on the UF-EMI were used for the new instrument. Eight assessed the level individuals engaged while thinking critically, while the other fourteen examined how much the individual sought out information during the same process. Participants used a five-point scale (1 = *Strongly Disagree*, 5 = *Strongly Agree*) to indicate their level of agreement with each item. Possible scores can range from 22 – 110.

The low scoring end of the continuum (engager) represents an individual's ability to anticipate situations, look for opportunities to use their reasoning skills, and confidence in their ability to reason, solve problems, and make decisions. The high scoring end of the continuum (seeker) represents their awareness of their own predisposition and biases, the extent to which they are hungry learners open to the opinions of others, looking for new knowledge, and having a desire to know the truth even if it conflicts with their presently held beliefs.

Undergraduate students enrolled in an oral communications course offered by the College of Agriculture to the entire university, were invited to complete an online questionnaire. Of the 205 students enrolled in the course, 196 completed the assessment for a 95% response rate. Scale reliability of the entire instrument was calculated, resulting in a Cronbach's alpha coefficient of .81.

Results/Findings

Of the group of students surveyed, 57.2% were female and 40.8% were male. They were primarily junior (43.4%) and senior (41.5%) undergraduate students. 62.9% were White, 17.0% were Black, 8.2% were Hispanic, 8.2% were Asian, and 3.0% reported their ethnicity as Other. Their ages ranged from 18 to 34 years, with the majority falling between 20 and 22 (76.1%). The inventory results indicated a mean score of 82.9 (SD = 5.8). Scores ranged from 62.5 to 98.3. Participants with scores of 82 or lower (39.6%) were considered engagers and those with an 84 or higher (41.5%) were considered seekers. Those falling between 82 and 84 scored high in both areas of critical thinking and were labeled mediators (19.9%). Differences in scores between gender, ethnicity, and age were tested using independent t tests and ANOVA to find there was no significant variation based on these demographic characteristics.

Conclusions

The newly revised inventory, placing individuals on a continuum, distributed the participants evenly with higher reliability than previously used measurement tools.

Implications/Recommendations/Impact on Profession

Using this new instrument, agricultural educators will be able to enhance their learning experiences. Through a deeper understanding of the differences in individuals, educators can develop opportunities for students to both seek out information, testing their previous thoughts and adjusting appropriately, and engage in activities which push students to develop confidence in problem solving and making decisions. The development of course materials which encourage students to develop critical thinking at a deeper level will not only enhance learning but make them more employable upon completion of their degree. Future recommendations include replication of the study to confirm results, as well as testing the instrument on a broader population since college students are in an environment which encourages critical thinking.

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Innovative Idea

How Pre-service Teachers are Preparing to Serve the Deaf in AGED: Opting for American Sign Language (ASL) as a "Foreign Language" to Meet Teacher Certification Requirements in Oklahoma

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How Pre-service Teachers are Preparing to Serve the Deaf in AGED: Opting for American Sign Language (ASL) as a "Foreign Language" to Meet Teacher Certification Requirements in [state]

Introduction

"In the past decade, various changes have impacted agricultural, career, and technical education" (Elbert & Baggett, 2003, p. 105), for example, an increasing number of special needs students have been mainstreamed into agricultural education classrooms (Gentry & Myers, 2010). Numerous high school students in the United States have disabilities that affect their learning. According to the Americans with Disabilities Act (ADA), a person with a disability is someone who, "1) has a physical or mental impairment that substantially limits that person in one or more major life activities; or 2) has a record of such a physical or mental impairment; or 3) is regarded as having such a physical or mental impairment" (The U.S. Equal Employment Opportunity Commission, 2008, sec. 902.1 [b]). Specifically, one such disability is deafness or hearing loss. In 2006, approximately 80,000 deaf or hard of hearing students in the nation's school systems were receiving services (i.e., special education assistance) (U.S. Department of Education, National Center for Education Statistics, 2009). Educators often may not know about a student's hearing loss; some student's decibel loss is not great enough to require an interpreter, but their hearing is limited or impaired nonetheless.

"Agricultural Education teachers are faced with various challenges due to the mainstreaming of disabled students into regular classrooms. Thus, it is imperative that teachers acquire the skills needed and increase their competency levels to teach special need populations" (Elbert & Baggett, 2003, p. 106). So, because many students in the nations' school systems are deaf or have a significant hearing impairment, American Sign Language (ASL) could be an appropriate alternative to a traditional foreign language for pre-service teachers to learn. By learning the language and "Deaf culture," pre-service teachers, including those pursuing a degree and teacher certification in AGED, may gain a better understanding of the "Deaf World." In the case of [* * *] University, students can use the degree program's five elective hours for this purpose ([* * *] University, 2007, AG-17).

How It works

Pre-service teachers at [* * *] University must complete five credit hours of foreign language as a part of their teacher certification requirements in [state]. Pre-service teachers may enroll in ASL 1 and 3 in the fall and ASL 2 and 4 in the spring. ASL 1 and 2 are also offered as month-long classes in the summer. Students must take the classes consecutively and have a passing grade in the previous class to be eligible for the next. ASL 1 and 2 are both five credit hour classes that focus on basic vocabulary and Deaf culture. ASL 3 is focused on grammatical structure of the language. ASL 4 explores ASL literature and poetry. However, successful completion of ASL 1 meets the "foreign language" requirement and introduces pre-service teachers to Deaf students and their culture. In ASL 1, "Learners will use finger spelling, signing, eye gaze, classifiers, mime, and facial expressions presented in context and through meaningful and experimental activities" ([* * *] University, 2007, p. 230). ASL 1 also highlights the importance of non-manual signals (i.e., facial expressions and body language).

Results to Date

Since 2006, four AGED pre-service teachers completed ASL 1 successfully. These pre-service teachers have been actively involved in the "Deaf Community" on campus as well as [city]. Pre-service teachers involvement around campus have included many activities such as, signing at athletic events, active members in the ASL club, and attending "silent dinners." One pre-service teacher, now enrolled as a graduate student, is currently training to become a certified interpreter. As part of her on-going training, this student is charged with interpreting for a deaf pre-service student during AGED course laboratories. Two caveats exist that students must consider when choosing ASL as a foreign language: 1) One instructor, thus, only one section, and 2) Honor students are granted priority enrollment, as a result, seat availability is an issue. This is unlike many other foreign languages at [* * *] University that have multiple instructors and sections. Subsequently, AGED pre-service teachers who are interested may not have the opportunity to enroll in ASL.

Future Plans

AGED faculty will continue to make pre-service teachers aware of ASL as a foreign language option during advising sessions. Pre-service teachers who have completed ASL could serve as a change agent regarding the adoption of ASL as a foreign language for other pre-service teachers (Rogers, 2003).

Currently, an AGED major who is profoundly deaf is attending [* * *] University. He aspires to become a secondary agricultural education teacher. His main goal is to graduate from [* * *] University and start an agricultural education program at the [state] school for the Deaf (J. A. Billinger, personal communication, February 25, 2010).

Cost

The cost associated with ASL is the current price of tuition and associated fees. At this time, tuition per credit hour is $131.35 and required fees for the course are $57.00, thus totaling $713.75 for the course.

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Research

Identifying Graduate Students' Areas of Concern

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Identifying Graduate Students' Areas of Concern

Introduction/Need for Research

The transition to graduate school can be very stressful for students, whether they are entering directly from an undergraduate program or from the workforce. Tokuno (2008) said the common belief that graduate students do not need additional support because they have already successfully completed an undergraduate program is incorrect. Providing assistance with the transition to graduate school may help improve the retention of graduate students and help them graduate on time. Ferrer deValero (2001) said an orientation course or seminars should be offered to help explain the intricacies of graduate school including paper writing and publishing, applying for grants, and learning how research is conducted.

The *National Research Agenda in Agricultural Education and Communications* (Osborne, n.d.) addressed the need for additional research to improve the success of students enrolled in agricultural and life sciences programs. The purpose of this study was to identify graduate students common areas of concerns regarding various aspects of their graduate school experience. Once these topics are identified, additional opportunities can be provided to decrease anxiety and improve student performance.

Theoretical Framework

Self-efficacy is "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p.3). This concept is of particular importance to education because people with higher levels of self-efficacy perform better at whatever the task may be. Schunk (2001) said self-efficacy can influence behaviors such as persistence, skill acquisition, effort expenditure, and choice of tasks.

Methodology

The population for this study included all graduate students on assistantship in the Agricultural Education & Communications Department at a southwest university. The researcher-developed survey instrument was distributed during a required orientation session before the Fall 2009 semester. The instrument had 41 questions that addressed a variety of tasks and/ or responsibilities graduate students often encounter during their time in graduate school. The instrument was divided into six sections: 1) Ins and Outs of Grad School, 2) Writing for an Academic Audience, 3) Locating and Reporting Research, 4) Presenting Research, 5) Evaluating Research, and 6) Computer Skills. Questions within each of these sections asked students to rank how confident they were performing certain tasks on a five-point Likert-type scale (*1=not confident at all* to *5=extremely confident*). A panel of experts was used to establish face and content validity of the instrument. Post-hoc analysis using Cronbach's alpha found the reliability of the individual constructs ranged from 0.77 to 0.98. Additional questions were asked to identify where assistance on the topics could be provided. Finally, several demographic questions were asked. Data were analyzed using SPSS 17.0 for Windows™.

Results/Findings

Of the 21 students who completed the instrument, 13 (61.9%) were master's students while the remaining 8 (38.1%) were working on a doctoral degree. Only six students (28.6%) were in their first semester at the university and nine (42.9%) had already completed the introductory research methods class taught in the department. Table 1 provides the six topics that received the lowest mean confidence scores while the highest mean confidence scores are displayed in Table 2.

Table 1. *Topics that received the lowest mean confidence scores*

Topic	N	Mean	SD
Identify where your research fits in the *National Research Agenda for Agricultural Education and Communication*	21	2.81	1.40
Use SPSS to analyze research data	20	2.90	1.48
Design a research poster	20	3.00	1.34
Effectively present a research paper at a research conference	20	3.05	1.54
Write a research poster narrative	20	3.10	1.29
Explain the procedure for the Institutional Review Board [University]	20	3.10	1.55

Table 2. *Topics that received the highest mean confidence scores*

Topic	N	Mean	SD
Use Microsoft Word to format tables	20	4.35	0.75
Develop a research presentation using Microsoft PowerPoint	20	4.35	0.88
Use Microsoft Word to format your writing (hanging indents, block quotes, etc.)	20	4.35	0.93
Name professional associations you should join as a graduate student	21	4.24	0.94
Use the physical library to find supporting research	21	4.14	1.15
Use electronic databases to find supporting research	21	4.05	1.16

The majority of students (n = 19, 90.5%) said they wanted additional training to address the mentioned topics. The most commonly preferred ways to receive additional training or support was in a specific course, such as a graduate seminar, (n = 13, 61.9%) followed by brown bag sessions (n = 9, 42.9%).

Conclusions

Students in this study indicated a number of areas where additional training or support is needed. The main concerns dealt with presenting research and the ins and outs of graduate school. Students were more confident in their ability to use computer programs such as Microsoft Word and PowerPoint. Students indicated that additional training or support should be provided in brown bag sessions and courses centered on a topic of interest (i.e. poster development and design).

Implications/Recommendations/Impact on Profession

As Tokuno (2008) said, graduate students need additional support to be successful and academic units should develop strategies to address areas of concern. Further research is needed with a larger sample of graduate students in agricultural education and communications to determine if the concerns identified in this study are shared with others. Additional professional development opportunities could then be developed at a local, regional or national level to address these concerns in order to help graduate students succeed in their graduate program.

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Implementing the Integration of STEM Curriculum in Agricultural Education: Implications for Pre-service Teacher Education

Innovative Idea Session

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Implementing the Integration of STEM Curriculum in Agricultural Education: Implications for Pre-service Teacher Education

Introduction and Background

A quality education is essential to compete in today's job market, not only when competing for "top tier" jobs but entry-level skill positions as well. So, it is easy to recognize why student success regarding knowledge and skill acquisition is important not only on the local level but also the global stage (National Center for Education Statistics, 2005; Provasnik, Gonzales, & Miller, 2009).

Stone, Alfeld, and Pearson (2007) found that the competence of America's high school students in curricular areas such as science and mathematics was insufficient for many entry-level employment opportunities. Moreover, according to Provasnik et al., U. S. students who took the Trends in International Mathematics and Science Study (TIMSS) assessment from 1995 to 2007 showed no improvement during that period, further reinforcing the need for increased Science, Technology, Engineering, and Math (STEM) curriculum integration. This has become an "escalating imperative" among lawmakers who have expressed concern over poor achievement levels of many students (Robelen, 2010).

The U. S. Bureau of Labor and Statistics has projected that a 22% increase of STEM-related job openings will occur due to growth and retirements in the U. S. by year 2014 (Terrell, 2007). This increase translates into 2.5 million additional workers who will be needed to fill STEM-related jobs. Due to this projected need for workers with highly developed competencies in math and science, teacher educators need to embrace STEM education as it relates to the professional preparation of teachers (Morrison & Bartlett, 2009).

The highly qualified requirement for instructors mandated by No Child Left Behind legislation of 2001 and the importance of improved program effectiveness (Reeves, 2003) highlights a need to integrate more STEM content into secondary agricultural education curriculum (U.S. Congress Act 109, 2006). Additionally, as posited by Washburn and Myers (2010), the importance of agriculture teachers and their science teacher colleagues collaborating is key to increasing student achievement. However, according to Myers and Thompson (2009), a philosophical shift is needed in agricultural education. Teachers need to "buy in" to the concept that core curriculum areas such as math, science, and reading should be integrated into agricultural education transparently and continually. Moreover, teacher preparation programs can serve as "catalysts" toward increasing STEM integration in the AGED curriculum.

How It Works

[***] requires AGED pre-service teachers to take several courses before embarking on their student teaching experience. Two of these courses include Foundations and Philosophies of Teaching Agricultural Education (AGED 3103) and Methods and Skills of Teaching and Management in Agricultural Education (AGED 4103). Students are required to create detailed lesson plans using the [***] lesson plan template. In AGED 3103 labs, students are required to incorporate STEM principles in their assignments. Students create and present a lesson emphasizing STEM curriculum integration, including applications. Activities must be included in lessons that hold potential for increasing student engagement and learning. AGED 4103 labs stress STEM concepts by requiring students to develop four lessons featuring various teaching methods. Pre-service teachers are required to incorporate science, technology, and math

principles in lessons through such methods as inquiry-based teaching and learning, demonstrations, case study, and modified lecture. Lab instructors assess students' lessons and facilitate their improvement, including STEM integration, before the lessons are taught during students' field experiences.

Results to Date

During the 2009-2010 academic year, 27 AGED 4103 and 74 AGED 3103 pre-service teachers received instruction on integrating STEM principles. Accordingly, students integrated science, technology, and math into their lessons. Lesson topics in AGED 3103 ranged from plant nutrient requirements to animal anatomy regarding science, ratios and percentages as well as graphing per math, and use of Interactive White Boards (IWBs) along with data management software addressing use of technology. Pre-service teachers in AGED 4103 created numerous lessons incorporating science, technology, and math. Specific examples included anatomy of various species of livestock, punnett square problems (genotypic and phenotypic characteristics and heritability ratios), perimeter and volume calculations, solving equations, IWB tools and applications, as well as power tools and land surveying instrumentation.

Future Plans and Cost/Resources Needed

AGED faculty at [***] will continue to prepare pre-service teachers in future semesters with an emphasis on STEM integration. They will continue incorporating and modifying assignments to require more use of IWBs and other instructional technologies to enhance student engagement and learning. Integration of science and math will be highlighted along with English, history, and social studies, where appropriate. Input from student teachers through focus group interviews during their capstone seminar debriefing sessions will be gathered. Faculty will examine and discuss student teachers' methods of incorporating STEM. Students' perceived needs regarding effective integration of STEM and possible opportunities for systematic inquiries on STEM integration will be explored by faculty. In addition, it is anticipated that AGED teachers' use of STEM content integration will be studied in the future, through Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis, for example.

Integrating STEM principles into pre-service AGED teacher preparation programs involves no "mandatory" costs. Time is the only "investment" required to create assignments stressing curriculum integration of STEM principles. Pending availability of resources, the average cost of an IWB is $2,100.00 (Bunch, Whisenhunt, Edwards, Robinson, & Ramsey, 2010). An alternative to the IWB can be the purchase of a Wireless Slate (WS) at an average price of $340.00 (Ramsey, Whisenhunt, Bunch, Edwards, & Robinson, in review). Purchasing realia to assist pre-service teachers in completing assignments could be an additional but optional cost.

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Innovative Idea: Poster Submission

Improving Facility Evaluation Skills

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Developing Facility Evaluation Skills (Innovative Idea)

Introduction/need for innovation or idea

Novice secondary agriculture teachers have many responsibilities their first year and are often overwhelmed with tasks and obligations (Mundt, 1991; Mundt & Connors, 1999). Agricultural teacher education is charged with preparing highly qualified and motivated teachers. When a teacher is hired the summer prior to beginning the school year, the entire agriculture department facility must be inspected, cleaned, sorted, and organized for any hope of maintaining order. Highly motivated, passionate teachers are more likely to have well organized and efficient facilities, and therefore, a positive learning environment. Classroom management has been identified as the strongest factor associated with student performance (Wang, Haertel, & Walberg, 1993). It is difficult, if not impossible to successfully manage the learning environment without a high degree of order within your physical space. “An ounce of prevention is worth a pound of cure” was an attitude fostered through the course and assignments.

Without the ability to identify and address issues in the laboratory facilities, the novice teacher will struggle to provide safe and meaningful instruction to their students. These laboratory facilities can include: agriscience, food science, aquaculture, agricultural mechanics (welding, small engines, construction, etc.), horticulture, plant and soil science, animal sciences, and natural resources (Talbert, Vaughn, Croom, & Lee, 2007). Hence, to develop the skill of identifying and addressing facility issues, the following assignment was created.

How it works/methodology/program phases/steps

Within the Facilities Organization and Management course at the University of Idaho, there were six local program visits. In addition to addressing Program Planning topics while on the visit, at the conclusion of the visit, teacher candidates complete an open ended evaluation form that assessed their perceptions of the facility. Teacher candidates were required to complete a detailed facility evaluation report including pictures illustrating areas of concern and an action plan to remediate those areas.

On the evaluation form, teacher candidates were asked to rate their first impressions of: grounds, building, classrooms, laboratories, and attitude of: host teacher, other teacher(s), students, and administrator(s) on a scale of 0 = *not impressed at all* to 10 = *extremely impressed*. The main concept of the evaluation form was to illustrate connections between the teacher candidate’s impressions of facilities with the attitude of those who live and work within those facilities. After each assignment was turned in, a class discussion ensued to address all areas of concern.

The following list guided the evaluation process:

- Spatial & Educational – How well was space used for educational purposes?
- Visual – How well could the instructor keep an eye on all students within the facilities?
- Thermal – How were facilities cooled and heated?
- Sonic – What areas of noise concern you in this facility?
- Aesthetic – How did the facilities please your eyes?
- Audio-Visual – How was the A/V equipment and PA system utilized in facilities?
- Equipment – What condition was all of the equipment in?
- Maintenance & Safety – What evidence was there of a safety consciousness/program and a maintenance schedule?
- Do you see any glaring issues that concern you as an educator?

Results to date/implications

This evaluation form has been utilized for the past six years with teacher candidates. This form develops their ability to identify and address issues when they walk into any agricultural education facility by identifying concerns and creating an action plan to address problems. After the fourth program visit, teacher candidates' ability to identify and address areas of concern was greatly improved.

After completing all evaluations, candidates are more prepared to effectively address any issues they will face when they are fully responsible for their own facilities. When the teacher educator visited graduates who had experienced this evaluation process, a high level of facility management and organization was observed when compared with other novice teachers who had not experienced the evaluation process.

Based on classroom reflections and discussions, students noticed a definite connection between attitude of teacher(s), students, and administrators with the quality and organization of the agricultural education facilities. This finding reminds students that their attitude is very determinant of their performance as an agriculture teacher, including managing facilities.

Future plans/advice to others

This evaluation document has served a significant purpose in providing an opportunity for students to develop their facility evaluation skills. This experience prepares the students for inheriting any facility issues or problems and creating a plan to solve them. This assignment will continue to be an integral part of the Facilities Organization and Management course.

Costs/resources needed

During the student teaching block, the teacher educators and cohort visited 6 local programs on 5 trips, up to 30 miles from the university. Each trip was a maximum of 3 hours with travel. The approximate cost was $60 per trip for a total cost of $300.

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Research

Improving Undergraduate Curriculum: What do our Alumni Think?

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Improving Undergraduate Curriculum: What do our Alumni Think?

Introduction

As with other media professions, agricultural communications is a swiftly changing field. As the nature of the profession changes, so must the academic programs designed to educate students. When considering what should be updated about a university's agricultural communications curriculum, alumni who are currently pursuing careers in the field may have some of the best insights. Thus, this study utilized a focus group composed of agricultural communications alumni from the agricultural education and communications department of a southern university in order to obtain relevant data.

The purpose of this study was to collect data about the agricultural communications program at a southern university and use this data to improve further curriculum. The research was guided by the following questions:

1. What was the overall satisfaction level of agricultural communications alumni with their education?
2. Which courses were most helpful to the alumni in their current jobs?
3. What, if any, additional courses would have been helpful to their current jobs?
4. Were there any general concerns about the degree program?

Conceptual Framework

Agricultural communications programs should frequently review and update their curriculum in order to ensure that their programs are providing the best possible education and career preparation for their students (Akers, 2000). Previous research (Sprecker & Rudd, 1998; Sitton, Cartmell, & Sargent, 2005; Telg & Irani, 2005; Doerfert & Miller, 2006; Corner & Cole, 2008a; Corner & Cole, 2008b; Irlbeck & Akers, 2009) suggested that recent college graduates needed to improve in several areas such as writing, critical thinking, work place etiquette, time management, photography, and Web design. While this information is useful, it was conducted on a nationwide level, and individual facets of these findings may not apply to each individual university. Thus, a focus group of alumni from the specified department was determined to have the most validity when considering their particular case.

Methodology

This qualitative research study utilized focus group methodology with a moderator to collect data. Five focus group members were chosen from alumni of the department. The chosen alumni keep in contact with the departmental faculty and also have jobs in agricultural communications.

Questions developed by the researchers were selected in order to cover most aspects of the program, including asking whether the focus group members found certain aspects of their education helpful or unhelpful in their careers. This was expanded upon with questions about specific classes and suggestions on classes or topics that could be added, and questions about internships. Finally questions were asked that covered what trends and career knowledge should be taught, with a final question to bring the discussion to a close—"what do you know now that you wished you knew then?"

Findings

All of the participants were female and graduated with their bachelor's degree after 2006. All have jobs in agricultural communications. Four of the participants had master's degrees.

The focus group subjects were fairly unified on many topics that were discussed during the actual focus group. Using an analysis aided by NVivo software, each subject's comments were coded and analyzed. Individual mentions of particular topics were counted among all the comments given by the members of the focus group. The most important topic to the subjects was career preparation and the focus of course curriculum, followed by the necessity of design-oriented classes, learning to use various kinds of technology and software, and concerns over the attitudes displayed by new graduates or interns. Other topics were discussed and were important to the attendees, but did not receive as many overall mentions. Some of these other important topics were internships, media campaign classes, the importance of portfolios, and the importance of writing.

The findings indicated that the subjects were pleased with the level of advisement received and were, overall, somewhat pleased with how their education had prepared them for their careers. However, they expressed concern over how their educational experiences had not gone into depth on some areas that would have been helpful in their careers (and, in most cases, the subjects ended up independently studying those areas after graduation). In addition, they expressed concern over the attitudes of those entering the workforce, indicating future curriculum should provide information to prepare students for the daily tasks.

Conclusions

The information gathered from the study suggests that, although the alumni felt that some aspects of their education had been very successful, such as the knowledge of design programs and theories, they felt that their educational experiences had been lacking in practical knowledge that they could have used in their future careers. In addition, the alumni suggested a heavier emphasis on internships to help prepare future students for careers and the opportunity to build a portfolio and have that portfolio critiqued before graduating.

Recommendations

The recommendations from this study suggest that more courses that allow for career preparation and fundamental knowledge should be implemented, or existing courses should have their curriculum modified in order to provide more usable information to the students enrolled in them.

For future research, a follow-up study is recommended with another set of alumni to see if the situation has changed from the one described by the focus group subjects. As the job market changes, it is important to study how well the program is adapting to produce graduates who are marketable.

While this study provides useful suggestions to agricultural communications programs, this study used a very narrow sample from a particular university, it is suggested other universities conduct their own studies with alumni.

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Innovative Idea

INCORPORATING COLLEGE SUCCESS TACTICS INTO A DUAL CREDIT COURSE CURRICULUM: COACHING STUDENTS ON HOW TO ENTER COLLEGE EFFICIENTLY AND EFFECTIVELY FROM THE FIRST DAY

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INCORPORATING COLLEGE SUCCESS TECHNIQUES INTO A DUAL CREDIT COURSE CURRICULUM: COACHING STUDENTS ON HOW TO ENTER COLLEGE EFFICIENTLY AND EFFECTIVELY FROM THE FIRST DAY

Introduction

Need for Innovation or Idea

Many students are “blind sided” as they leave high school and enter post secondary education. They are unaware of the responsibility and good study habits required in the college setting. Many of these students lose scholarships in the first year due to the required GPA for the particular scholarship. These students could have possibly increased their chances of maintaining these much needed scholarships if they had known what to expect in college. Dual credit and dual enrollment classes can help to alleviate this lack of preparedness for these students.

Research has shown that students who are actively involved in any planned area of interest during high school have a greater chance of success in both post-secondary education and when they reach the workforce, enabling them to have a better chance at high-skill, high wage, and / or high-demand occupations.

With this in mind, the primary focus of this project is to incorporate various college success tactics and activities into the existing curriculum and allow for any eligible student who is enrolled in Greenhouse Management in the Agricultural Education classroom in the specified school system to gain three hours of college credits while still in high school in agricultural education. These students were enrolled in ABAS 1101, Introduction to Ornamental Horticulture Science, in the School of Agribusiness and Agriscience at Middle Tennessee State University (MTSU) while simultaneously earning high school credit in Greenhouse Management at the secondary level. This post-secondary course is required in all areas of Agriculture (or can be substituted) at the post-secondary level at MTSU.

Middle Tennessee State University, in partnership with thirteen secondary schools won a Perkins IV Reserve Fund Grant to aid in course development, teacher training and oversight of coursework for dual credit. MTSU is the first four year institution in Tennessee to provide a dual credit offering with a Career and Technical Education course. These schools worked in cooperation with MTSU to develop the necessary competencies to allow for dual credit. We suggest that incorporating college success techniques into the existing dual credit curriculum will improve college retention rates and performance.

Method

Our Model

In addition to the course curriculum, college success techniques and concepts were introduced to the participating students by the dual credit coordinator. The coordinator visited each of the thirteen schools a minimum of four times. During the visits these concepts were introduced by a hands-on computer activity entitled *What Will I do After High School?*, developed by the dual credit coordinator and a video entitled *Cracking College: The Seven Savvy Secrets of College Students.* Students, through the leadership of the Agricultural Education teacher at the secondary level and the dual-credit coordinator at the post-secondary level, were exposed to the vital strategies and techniques listed below in the results section.

Our goal was to integrate a "coaching" segment into the proposed curriculum to benefit the future success of the student at the post-secondary level. Learning commitment and teaching students' college responsibility of post-secondary studies early in their development should allow students the much needed assistance to transition and succeed as post-secondary students.

Results

Participation

There were thirteen grant schools and twelve non-grant school participants. Within these schools, 448 students participated and were exposed to the course, the dual credit coordinator and the following college success techniques of:

- Choosing the best courses.
- To Study Smarter, Not Harder
- Excelling in large classes
- The art of exam preparation
- "Kenetic energy" study techniques
- The ultimate place to study.
- Easier homeworks
- How to schedule more free time
- Ace your finals!
- Getting outstanding letters of recommendation
-"College Friendly" time management
- Succeeding with less stress
- The easy secret to turning B papers into A papers.
- Finding school sponsored exam repositories.
- How to choose the best professor and course
-Balancing your social life with great academics
- Finding out what is going to be on the exam.

Implications

Students will be better prepared for college classes because of the integration of techniques to improve college success into the dual credit curriculum. More students should transition to a post secondary program and post secondary scholarship and graduation rates may increase at the post secondary level. Students, who might not have considered post secondary before, will get a sense of "I can too". Stronger alliances will be built between university and high school faculty.

Future Plans

Current

MTSU is currently offering a second dual credit course, Agribusiness Finance/ABAS 1201. The dual credit course coordinator visits and will continue to visit each participating school to introduce these college success techniques. We plan to conduct a research study on the effectiveness of these suggested college success techniques in the near future.

Advice

This is a great opportunity for not only the university but most importantly the student. The key to the success of this is to be sure all stakeholders are involved at all times. This would include: university faculty, high school teachers, principals and school counselors. We found that when everyone is involved the courses run smoothly.

Resources

The initial grant provided each school with the necessary resources to offer the course. However, most schools have these resources in place. MTSU provides the dual credit course coordinator and is available to visit each school upon request.

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***Innovations in Agri-Life Sciences*: A Journal for Secondary Academic Excellence**

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Innovations in Agri-Life Sciences: A Journal for Secondary Academic Excellence

Introduction/Need for Innovation

There is a growing concern that the United States workforce will be unable to compete in the global market in the near future (Friedman, 2007). This concern is enhanced when examining the global issues associated with the life sciences (Duncan, 2009). In order to address this concern, the Institute of Medicine, the National Academy of Engineering, and the National Academy of Science called for an increase in science, technology, engineering and math (STEM) in primary and secondary education (Chen, 2009). This new focus provided a catalyst for career and technical education to integrate STEM concepts across the curriculum as was evident with the passing reauthorization of the Carl D. Perkins Act of 2006. Under this reauthorization, federal funds are allocated based on the integration of core content into career and technical education (Hyslop, 2008).

Over the past decade the agricultural education has provided a contextual basis for the application of STEM concepts (Balschweid, 2002; Park & Osborne, 2006; Washburn & Myers, 2010). For example, in 1998, the National FFA Organization implemented the FFA Agriscience Fair career development event (FFA, 2010). Another example is the integration of agri-life sciences courses available for advanced placement in one Midwestern state (Cummins, 2008). Finally, the recent development of the Curriculum for Agricultural Science Education (CASE) provided a nationwide educational model which infuses STEM concepts into its' lessons (National Council for Agricultural Education, 2010).

While there are several aspects of agricultural education which assist students in gaining a deeper understanding of STEM concepts, there is not a venue for students to further their scholarship by publishing their findings. Nor is there a structure which allows students in agricultural education to compare and discuss results from their studies with those done by students in the biological and physical sciences. Therefore, it was the purpose of this project to develop an online peer reviewed secondary academic journal which focuses on the agri-life sciences.

Methodology

Innovations in Agri-Life Sciences (*IALS*) is an academic journal developed for high school students who are interested in exploring the agricultural and life sciences through inquiry and experimentation. Students advance science and technology by examining contemporary societal and environmental issues. The purpose of *IALS* is to provide an online academic source which captures student innovation and originality. Additionally, it provides a platform for students to present their findings and discuss their findings with peers both in agricultural education and the biological and physical sciences.

A unique aspect of the journal is that it is both grass roots and student centered. Guest editors consist of practicing teachers and undergraduate students majoring in agricultural education and agricultural communications. These editors rotate on a biannual basis as the journal is only published twice a year. Editors receive student submission and remove identifiable information for blind review. Similar to a professional academic journal, students are required to outline experimentation process including; an abstract, introduction, literature review, definition of the problem and hypotheses, experiment methods and procedures, and results, conclusions, and discussion regarding the experiment.

Manuscripts are then sent to a panel of peer reviewers selected by grade. Reviewers are provided with a scoring rubric which outlines the goals and expectations of the journal. Reviewer scores and edits are then sent back to the editor who makes the final decision to accept with no revisions, revise and resubmit, or do not accept at this time.

Results and Implications

Since unveiling of this journal in July 2009, much interest has developed for this project. We have recently received our initial submissions, and are in the process of reviewing and preparing those for publication. The intention of these submissions is to serve as a resource for agriculture and science students and teachers alike. This will assist in developing ideas for new experiments and avoiding the potential for identical studies.

To help educate interested parties with this idea, presentations have been made on the national level. In October, 2009, information was made available to students and teachers at the National FFA Convention. Following that event, detailed workshops were presented at the 2009 Association for Career and Technical Education conference. This workshop's focus guided teachers through submission process, and adapting their student's project to shape the journal guidelines.

Future Plans/Costs

The intention of this journal is to assist agriculture and science teachers in integrating STEM concepts into their curriculum, raising the academic standard. Goals for the next year include recruitment of projects by students in core science and math classes, inevitably raising the academic standard for agricultural teachers. Additionally, there are plans to promote this resource and establish recognition of student excellence in the FFA periodical FFA New Horizons. Lastly, *IALS* plans to hire an undergraduate student worker to assist in the daily operation of the journal.

This project was initially funded as part of a USDA SPECA grant. While funds supported the initial journal's initial development, *IALS* hopes to become self sustainable within the multi disciplinary department of Community and Leadership Development at the University of Kentucky by maintaining its grassroots design by instituting guest editor roles within the undergraduate curriculum.

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Integrating Teaching With Technology

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Integrating Teaching with Technology

Introduction/Need for Innovation

As new technology is being used in the daily lives of college students, campuses must discover new approaches to keep up with the demands of its learners. George (2000) stated, "Technology can play a vital role in helping students meet higher standards and perform at increased levels by promoting alternative, innovative approaches to teaching and learning" (p. 57). Many instructors are adapting instructional delivery to ensure course content fits students' learning styles. Alston and Warren (2007) specifically stated the importance of using more web-enhanced instruction and technology assignments in agricultural education courses to better prepare future agricultural leaders. A new multimedia resource, the Burns Technology Center Studio 1080 (BTC Studio) at <University> allows students to use technologies to build digital exhibits via a collaborative web-based system. This system helps students to develop communication and technology skills by using specialized software to create touch-screen exhibits featuring video, images, text, slide shows and animations (<state> University, 2009). This resource has been integrated into an agricultural communications course to educate students on how to apply communication skills into a digital storytelling and educational context.

How it Works/Program Phases

The goal of the agricultural communications course was to utilize multimedia technologies to develop an educational capstone project. Students created an online content module using an integration of technologies and presented it using the interactive, touch-screen system. This multimedia collaborative research project was 50% of the course grade. The final exhibit had to effectively educate the audience in a chosen topic area of agriculture.

Throughout the semester, students were required to complete a variety of assignments that developed communication skills and also directly related to their final project. Assignments were focused on developing educational materials, communications skills, and technical competencies to be integrated into the exhibit. Project assignments included: (1) Write a detailed proposal of your research project, (2) Create a storyboard for a multimedia exhibit, (3) Conduct an informative interview with professionals/experts on your research topic, (4) Create a photo portfolio for use in the exhibit, (5) Shoot and edit videos to create an inclusive two-minute video to be used in the exhibit, (5) Develop a comprehensive 24-screen educational, research-based exhibit using the web-based BTC Studio software, and (6) Present your BTC Studio exhibit to the class and public.

Each student group created a 24-screen digital exhibit based on primary and secondary research conducted during the semester. The module also had to include at least two of the following components: a map, graphics, music/audio clip, an interactive quiz, or a slideshow of pictures. Course content focused on developing students' basic competencies in the areas of public relations, technical writing, research skills, video production, photography, storyboarding, scriptwriting, and graphic design. Assignments encouraged students to utilize various communication methods and techniques to build the exhibit.

Results/Implications

The goal of the course was not only to engage students in learning a variety of technical skills, but also to provide them with the opportunity to use rich media technologies to showcase capstone projects. Development of a research-based agricultural exhibit required students to conduct research, design educational content, utilize multimedia software, integrate technologies, and build digital exhibits. Use of this integrated teaching approach inspired students to apply agricultural communication skills, including written, oral, digital media, and research, in a new way. The capstone project was graded on the professional quality of each media asset produced, as well as on the overall presentation and how well the module communicated and publicized the agricultural information. Peers, the instructor, and BTC Studio directors evaluated the final module. As a result, students learned how to integrate technologies to showcase communications work. Students also gained networking contacts in the agricultural field and a better understanding of careers in agricultural communications from the research conducted.

Students in two agricultural communications courses have created ten exhibits for the BTC Studio. Example topics include, “Beef Production-Pasture to Plate”, “Noxious Weeds of <state>”, “A Course about Horses”, “An Overview of Extension”, and “The History of Agriculture in <state>”. A post-evaluation questionnaire revealed positive feedback. Students reported that they learned to work with new software programs such as Photoshop, iMovie, iPhoto, Google Picasa, PowerPoint, a scrapbook program, Microsoft Paint, Microsoft Works, Windows Movie Maker, and Audacity. Specific communication and technology skills learned included photo editing, interviewing, video production, audio recording, design principles, graphics creation, summarizing and organizing information, storyboarding, file conversions, and creative ways to communicate information.

Future Plans/Advice to Others

The agricultural communication class intends to continue this project with the BTC Studio. Other courses and universities alike should strive to incorporate unique and innovative multimedia technologies in order to meet student needs. The U.S. Department of Education (2009) reported an increasing amount of evidence related to the beneficial opportunities of using technology to improve education. Educators can easily integrate photography, videography, audio recording into standard writing assignments, giving students a more technologically creative approach to course work. Instruction can be done formal or non-formal educational settings, which can reach out to community members and be used as a communication link between schools and communities. A common software program, such as PowerPoint, could become interactive by adding a video clip with audio from Windows Movie Maker, challenging students to integrate technologies in a new way and create modern presentations.

Costs/Resources

The Agricultural Education program was privileged to have innovative multimedia system like the BTC Studio to utilize as part of a course. General access to computers and digital equipment with the right software can add a multimedia component to any course. The equipment used in the course was digital cameras, video cameras, and audio recorders provided by the students or through the department.

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Jamaica: Dawn of a New Beginning

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Jamaica: Dawn of a New Beginning

Introduction

Agricultural Education undergraduates must be prepared to live and work in a multicultural, global society. Talbert and Edwin (2008) recommended that these students experience gender, ethnic, socio-economic status, and rural/urban diversity in their field placements. However, they found that one-third of the responding agricultural education programs placed students at schools with little to no ethnic diversity. In addition, using U.S. Census Bureau data, less than five percent of U.S. college students study abroad in any particular year (U.S. Census Bureau, 2004).

In 2004, the Agricultural Education program at a Midwestern university proposed a short-term study abroad for its teacher education students. The country of Jamaica was chosen as it had a secondary agricultural education system, a college of agriculture, and was substantially different in ethnicity and socioeconomic status from the Midwestern state.

How it Works

An internal university grant supported the two instructors to travel summer 2004 to Jamaica to make in-country arrangements for the initial study abroad experience in summer 2005. From this exploratory trip it was decided that the Jamaican College of Agriculture, Science, and Education (CASE) would be the "home base" for the study abroad. It was also decided that the experience would be three weeks in length. This length was chosen for both pedagogical and financial reasons. It also seemed to be the length of most other summer study abroad programs at the Midwestern university.

At this Midwestern university for study abroad experiences, students pay program fees instead of tuition. This allows study abroad programs to be self-funding and self-sustaining. A budget is developed based on a targeted number of participants and expected expenses.

It was decided that the experience would begin immediately after the conclusion of spring semester exams. This allowed students to complete the three week experience and still have June and July to work at internships or take on-campus summer classes. This schedule also allowed the instructors to be on-campus during the state's FFA Convention, the university's summer incoming student registration, and the state's agriculture teachers association summer conference.

Students took two teacher education courses, *Introduction to Teaching* and *Multiculturalism in Education*, worth 6 semester credit hours during the Jamaican study abroad. The schedule was: Monday/Wednesday/Friday classroom days, Tuesday/Thursday tropical agriculture tours or high school observations, and Saturday/Sunday recreational and cultural activities. Classroom days cover essentially the same content as that covered during the academic year, on-campus offerings of the courses. Course assignments are the same as the on-campus offerings with minor adjustments for technology and course length.

Results to Date/Implications

Summer 2009 was the fifth group of students to participate in the Jamaica study abroad. Group sizes have been 12, 11, 12, 13, and 11 for a total of 59 participants. This has been approximately 50% of the freshman class (the target audience) in agricultural education at this Midwestern university. The program has been successful in being self-funding and sustainable.

In the course evaluation, students have responded that the program provides them experiences they could not obtain in the United States. They reported they now know what it feels like to be an ethnic minority. They also reported they have a greater appreciate for the wealth in the United States and have ideas on how to use inclusive teaching for students of all backgrounds.

Future Plans/Advice to Others

The first year the experience was 22 days inclusive of the two travel days to/from Jamaica. This was too long both financially and pedagogically. Therefore, the next four trips were 17 or 18 days in length. With a more efficient itinerary, this has proven to be an appropriate number of days.

Jamaica is a country in which transportation outside of chartered services may not be safe and parts of the country, Kingston in particular, are not safe for student to explore on their own. Because of this, all trips and activities including recreational/cultural were as a group. This had the unexpected consequences of bonding the students as a group and encouraging less-adventuresome students to try new experiences.

The instructors initially believed that cost would be a prohibitive factor. We have found that as long as the experience is comparably priced to other study abroad courses at the university that students see the cost as reasonable. However, we did hear anecdotally that several students who were considering participating in summer 2009 did not because of the difficult economic times.

Costs/Resources Needed

Each university will have a slightly different structure for study abroad. At this Midwestern university, the Jamaica study abroad costs each student participating approximately $4,000 using a budget with 12 participants. This covered: airfare; university fees; travel insurance; in-country travel; in-country food; in-country lodging; entrance fees to cultural/recreational activities; instructor travel expenses, salaries and benefits; and CASE room and equipment rental. Because these expenses were a part of the program fee, the financial aid office treated the fee the same as tuition. Therefore, students could use grants, loans, and scholarships to pay the program fee. Additional expenses that students had to pay for out-of-pocket included: passport, travel to the U.S. airport, souvenirs, and miscellaneous expenses.

From an instructor perspective much of the planning and program arrangements took place during the preceding academic year. This required time resources and organizational skills.

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Leadership and Decision-making Life Skill Development in 4-H Shooting Sports Participants

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Research Poster

Theoretical Framework

Through experiential learning and interacting with adult leaders, 4-H clubs emphasize both personal and group leadership development. Adolescence is a time when experiential learning and adult contact is crucial to adolescent development (Wessel & Wessel, 1982). The Experiential Learning Model allows youth to learn several life skills through various experiences (Enfield, 2001). Specifically in the processing step, youth should relate the experience to a targeted life skill (Hendricks, 1998). Development of these life skills though experiential learning is the cornerstone of 4-H Youth Development programming (Boyd, Herring, & Briers, 1992). Life skills development was built into 4-H projects, activities and events to help youth become contributing, productive, self-directed members of society.

Skills needed by youth are identified in the Targeting Life Skills Model (Figure 2). The Targeting Life Skills Model defines leadership qualities as someone who has a vision, motivation to lead, inspires others to action, communicates effectively, works well with people and groups, involves others in meaningful ways by delegating responsibility and sharing leadership, can plan, organize and assess goals, accepts differences in people and in their opinions, has personal values and traits of good character, generates resources like time, money and other people (Hendricks, 1998).

Decision-making is a complex process people use in their daily lives to answer questions, choose activities to complete, and even choosing a vocation (Adkins, 1995). Hendricks (1998) classified decision-making as part of one of the 4 Hs: Head. Thinking is the ability to form ideas and make decision by choosing among several alternatives. The decision-making process is to specify goals and constraints, generate alternatives, consider risks and appraise alternatives, and choose an alternative to implement (Hendricks, 1998).

Purpose and Research Questions

The purpose of this descriptive research is to determine whether 4-H youth participating in [State] 4-H shooting sports learn leadership and decision making skills.

1. What leadership skills do the [State] 4-H Shooting Sports state invitational qualifiers perceive they have gained by their involvement in the [State] 4-H Shooting Sports Program?
2. What decision-making skills do the [State] 4-H Shooting Sports state invitational qualifiers perceive they have gained through their involvement in the [State] 4-H Shooting Sports Program?
3. What proportion of variance in [State] 4-H Shooting Sports state invitational qualifiers leadership and decision making skills can be attributed to each selected characteristic: age, ethnic background, gender, number of years in 4-H, number of years in 4-H shooting sports, and number of hours practiced per week?

Methodology

The population asked to participate in the research was the elite participates that qualified to compete in the state invitational pistol, archery, and shotgun contests. The actual number of participants in the [State] 4-H Shooting Sports was the total sampling population of 209 participants. The amount of acceptable surveys returned was 179, which calculates to a return rate of 85.6%.

The research design of this survey research project is descriptive. It uses a cross-sectional design approach to gather self leadership and decision-making life skills perceptions of elite 4-H Shooting Sports participants from the [State] 4-H State Shooting Sports Invitational competitions.

Findings

The overall average of youth surveyed indicated an above average perception of their gain in leadership and decision-making life skills through participation in 4-H Shooting Sports. Female were found to score higher on both scales as compared to males, but males were the majority of the population sampled.

In an average of all the independent variables, the average participant in [State] Shooting Sports Program is a Caucasian male 16 years old, has been participating in 4-H Youth Development Organization for five years, has been participating in [State] 4-H Shooting Sports for four years, and practices four to six hours per week to prepare for competitions.

Conclusions

1. Youth participants in [State] 4-H Shooting Sports perceived themselves to have more than a moderate gain in Leadership Life Skill Development Scores. More than often they utilize decision-making life skills through the program, as well
2. Overall leadership life skills and overall decision-making life skills development were highly correlated. Both leadership and decision-making development are part of the complete life skills needed for youth to be a successful adult.
3. Age in the [State] 4-H Shooting Sports participants was highly correlated related to both leadership and decision making skills As the participant grew older, the participant gained leadership life skills.
4. Gender found a difference in male life skill development versus females'. Females rated themselves to have higher leadership and decision-making life skills development than males.

Recommendations

1. Conduct a similar study with youth participating in other 4-H Youth Development project areas.
2. Repeat this study with juniors and seniors within the 4-H SSP at the district competition level to determine how leadership and decision-making life skills changes with maturity.
3. Repeat this study in subsequent years to determine gains in leadership or decision-making life skills over time.
4. A study of 4-H SSP alumni who are now in adults would provide more insight to long-term benefits from participation in the 4-H SSP.

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Innovative Idea

Making Learning Meaningful for the Millennials: Podcasting with a Purpose in Agricultural Education

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Making Learning Meaningful for the Millennials: Podcasting with a Purpose in Agricultural Education

Introduction and Background

Change is inevitable. Not only in our personal lives do we experience change, but our Nation and local communities are constantly undergoing revision for the common good. Requiring stronger accountability in our Nations' schools was initiated with the No Child Left Behind (NCLB) legislation of 2001. NCLB increased qualification requirements for teachers as well as criteria for measuring program effectiveness (Reeves, 2003). On the eve of his election President-elect Barack Obama challenged the Nation when he stated that, "Today we begin in earnest the work of making sure that the world we leave our children is just a little bit better than the one we inhabit today" (Phillips, 2008).

As we face the challenges that come with a new generation of learners, we must reconsider pedagogy and identify practices and tools that are relevant for today's millennial generation (McAlister, 2009). Technological advances foreign to previous generations of learners are commonplace among today's "computer savvy" generation. An increased use of social networking sites (2009) such as Facebook and Twitter coupled with the millennials' ready acceptance of MP3 technology found in Apple's IPOD is evidence of this generation's preference for electronic communications. Consistent and intensive use of this technology has essentially "hardwired" the millennial's brains differently as a result of this technology (Taylor, 2006). So, it is important that teachers embrace technologies used commonly by millennial students to educate them more effectively (Williams, 2008).

In a study by Murphy and Terry Jr. (1998), it was concluded that electronic technologies would improve the way we teach agricultural education, allowing for increased communication between students as well as students and teachers. Additionally, it was concluded by Murphrey, Miller, and Roberts (2009b) that, technologies popularized by millennials, such as the IPOD, are capable of increasing student learning. Understanding that "teachers often teach as they are taught" (Murphrey, Miller, & Roberts, 2009a, p. 98), it is essential that pre-service teachers of agricultural education be exposed to these new technologies as instructional tools to add to their "teaching toolbox."

How It Works

In the course AGED 4113, Laboratory Instruction in Agricultural Education, pre-service teachers were introduced to the concept of audio podcasting, using free audacity software and iPod/MP3 technologies. The introduction of this technology was to encourage pre-service teachers to incorporate these technologies in lessons, as well as their preparation of students for Career Development Events (CDE) and other FFA activities. Students were provided a detailed demonstration and training, which included general usage of the iPod/MP3 and the free audacity software. Thereafter, student teachers were charged with developing an audio podcast of the FFA Creed for CDE preparation to use during their field-based student teaching experience. The student teachers were also encouraged to continue to develop other podcasts during their 12-week student teaching experience.

Results to Date

To date, 27 pre-service teachers received instruction on the podcasting technologies, found Internet examples of audio podcasts and created their own audio podcast of the FFA Creed for use in CDE preparation during student teaching. The reactions of pre-service teachers regarding the podcasting were positive. Pre-service teachers also identified several areas of benefit regarding podcasting technology. These areas included

- Lessons for use by the instructor
- Lessons for instructional use during an instructor's absence
- Preparation of CDE teams
- Preparing students for public speaking events
- Local SAE tours to expose students to a variety of SAEs

Future Plans and Cost/Resources Needed

AGED faculty at [***] will continue to prepare pre-service teachers for the remainder of the Spring 2010 student teaching semester. AGED faculty will also incorporate the use of video podcasting into the already existing audio podcasting activities to enhance pre-service teachers' understanding and use of podcasting generally. In the future, a focus group interview will be conducted during the student teachers' capstone seminar debriefing session. This will enable faculty to examine and discuss student teachers' use of podcasting as a learning tool with their secondary students. The focus group interview will inform faculty about students' perceived needs regarding their effective uses of podcasting and what may be opportunities for systematic inquiry on podcasting as an instructional tool. In addition, it is anticipated that cooperating teachers' use of podcasting will be studied in the future, together with the impact of student teachers on cooperators' adoption and use of this innovative instructional delivery method, i.e., student teacher as "change agent" (Rogers, 2003).

Item	Cost Range	Average Cost
iPod or MP3	$59-$300	$179.50
PC or Mac	$750-$2,500	$1,625
Audacity Software	Free	Free
Total	**$809-$2,800**	**$1,804.50**

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MENTORING "QUICK-STARTER" GRADUATE STUDENTS

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MENTORING "QUICK-STARTER" GRADUATE STUDENTS

Introduction/Need for Innovation

The agricultural education discipline utilizes mentoring relationships in teacher preparation programs (Peiter, Terry, & Cartmell, 2005), extension education (Phillips & Bradshaw, 1999; Rogers, 1997; Zimmer & Smith, 1992), and in faculty development programs at the university level (Eastman & Williams, 1993). Mentors are those individuals knowledgeable in their field, established in an organization, and who serve to support the personal and professional development of a protégé (Lamm & Harder, 2009; Mincemoyer & Thomson, 1998). Kram (1985) determined that mentoring relationships serve two distinct functions, career development support and psychosocial support.

Williams (1997) suggested that new agricultural education graduate students work diligently to identify mentors and seek their input. For graduate students, one of the most important mentoring relationships is between student and advisor. While these relationships vary widely, many include both career development and psychosocial support. Typically the advisor-graduate student pairing is similar to an apprenticeship, where the student is socialized into the profession by the advisor (Bieber & Worley, 2006). However, Allen, McManus and Russell (1999) found that career development and psychosocial mentoring provided by graduate student peers helped students cope with stress and successfully adjust to their new roles.

Diffley (2007) acknowledged that being new to the academic environment can be intimidating and recommended students build networks of peers. Joining a graduate student support group offers psychological support, as well as a chance to obtain valuable feedback from more senior students (Peters, 1992). Peters declared that new graduate students should look to their peers as the greatest source of support because the doctoral program experience can be isolating without it.

Due to the importance of peer relationships among graduate students, a mentoring program was created in an agricultural education and communication department at STATE. The program was developed in and continues to be managed by the departmental graduate student organization. However, at the inception of the program, no written plan existed to help guide the mentor/protégé relationship. As a result, generations of graduate student mentors have spent varying amounts of time, had varying levels of success, and uneven levels of commitment to the program. The resulting relationships have therefore been inconsistent, and unfortunately sometimes unfulfilling.

How it Works/Steps

In early summer 2009, the departmental graduate student association president paired incoming graduate students with mentors. Assignments were based on the following criteria: 1) area of study of (communication, extension, leadership, or teacher preparation), 2) degree program (doctorate or masters), 3) previous professional experience of mentor and mentee, and 4) age.

The association president then arranged a brainstorming session with the mentors where they were asked to reflect about the support they received as new departmental graduate students. Thoughts and advice were offered on how to build strong mentor/protégé relationships based on the previous experiences of the participants, both as former mentors and protégés. At the conclusion session, consensus was reached on items believed to be essential in shaping positive mentoring relationships. Subsequently, a mentoring handbook providing a set of guidelines to help mould graduate student mentor/protégé relationships was created and distributed to the mentors. The handbook outlines elements such as recommended introductory email information, meeting frequency, discussion topics, and other potential discussion topics.

To assess the success of the brainstorming session and mentoring handbook, those graduate students assigned as mentors were asked to complete an on-line survey containing seven open-ended questions regarding their perceptions of how the session and handbook enhanced their mentoring experience.

Results to Date/Implications

Mentors reported the brainstorming session assisted them in feeling more connected to the other graduate students within the department, strengthened their ability to see different perspectives in regards to entering graduate school, and assisted in further defining their role as a mentor. The handbook itself had mixed reviews. Several mentors said they used their notes from the meeting more than the handbook, and one reported not looking at it at all. Of those that did refer to the handbook, they felt it held them accountable and assisted them in continuing their mentor relationship long term. Maintaining open and honest discussions about the role of mentoring within the department, building consensus among those involved on what the mentoring process should entail, and keeping an open mind when working with new graduate students were the results of the brainstorming session and assisted in making the mentoring program even more successful.

Future Plans/Advice to Others

The departmental mentoring program was enhanced by the process of creating the mentoring handbook. Mentors commented that the brainstorming session offered a great deal of support and guidance for their relationships with protégés. Because of this, the graduate student association plans to schedule an annual meeting where mentors can discuss strategies for making mentoring relationships successful and adding ideas to the handbook.

Antidotal evidence suggests that the process of discussing mentoring relationships has a positive impact. The mentoring handbook serves as the guiding document for the annual process of brainstorming and incorporating new ideas, and is a resource for mentors year-round. Other agricultural education departments may benefit from implementing similar mentoring programs. In doing so, these departments should encourage graduate student organizations to create similar handbooks tailored to meet the specific needs of new students in their respective departments. The collaborative process of development achieves buy-in from mentors, while the annual brainstorming meeting provides limited but necessary structure, allowing (newly) former protégés and mentors alike to contribute to the program. Hopefully, former protégés then choose to serve as mentors themselves in future years due to their successful mentoring relationships.

Costs/Resources Needed

Currently, the mentoring program operates at no direct cost to the mentors, protégés or department. The primary resource needed to maintain the program is time. While graduate students often do not have a wealth of this resource, time devoted to this relationship is beneficial to both mentor and protégé.

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Poster Type (Research)

Northwest's Supply & Demand for 2009-2010: Who is filling the Ag Teaching Positions?

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Northwest's Supply & Demand for 2009-2010: Who is filling the Ag Teaching Positions?

Introduction

Within agricultural education, our country has faced a "very real teacher shortage since the 1960s" (Team AgEd, 2006, p. 24). Considering the documented teacher shortage and closing of agriculture programs, the National Council for Agricultural Education's "Long Range Strategic Goal" proposed the 10 by 15 initiative to have 10,000 quality agricultural education programs by 2015 (Team AgEd, p. 18, 2006) to motivate agricultural teacher education programs to rethink recruitment and retention. Currently there are approximately 8000 secondary agricultural education programs in our country (Team AgEd, 2006). With only 53% of the newly qualified agriculture teachers at the national level projected to enter the field in 2007, "This [teacher shortage trend] has the potential to reach epidemic proportions…" (Kantrovich, 2007, p. 37). The teacher shortage will only become more significant over the coming years.

Theoretical framework

With programs closing because of the teacher shortage, the question was asked, "what can we do to increase the number of graduates who seek teaching careers?" (Team AgEd, 2006, p. 24). To address this important question, "We need to research these questions at all levels (state, regional, and national) in order to find viable solutions" (Team AgEd, 2006, p. 24). Roberts, Harlin, and Ricketts (2006) identified three solutions: (1) increase the number of agricultural education graduates, (2) increase the percent of agricultural education graduates who choose to enter teaching, or (3) find alternative sources to supply agriculture teachers. Due to the lack of accurate empirical evidence, it is unknown which of the options the seven Northwest agricultural teacher education programs should focus their attention on. The three solution model (Roberts, Harlin, & Ricketts, 2006) served as the theoretical framework for this study.

While a national teacher shortage is quite evident in the literature, data does not clearly provide the Northwest a precise outlook on the number of graduates from each Land-Grant Institution and whether they enter the teaching profession, nor does the data identify the number of secondary agricultural education positions in each Northwest state (Idaho, Montana, Nevada, Oregon, Utah, Washington, & Wyoming). The purpose of this study was to capture accurate data as part of a multiyear tracking effort (Swan, 2009) that will provide insight as to where future emphasis should be placed for maximum benefit for the Northwest.

Methodology

Supply and demand data including graduates, open positions throughout each state, and what teacher classifications actually filled those positions were captured through contact with the seven Northwest Land – Grant University agricultural teacher education faculty coordinating the student teaching experience and the state program managers overseeing agricultural education.

Results/Findings

The Northwest Land-Grant Institution's agricultural teacher education programs produced 32 graduates for the 2008-2009 school year and there were 65 full time positions available in the Northwest area for the 2009-2010 school year, possibly filling 49% of those positions. Twenty two of the 32 (69%) 2008-2009 graduates taught secondary agriculture during the 2009-2010 school year (Table 1). Of the 65 positions open in the Northwest, 2 went unfilled (Table 2).

Table 1. *2008 - 2009 Northwest Land-Grant University's agricultural education teaching graduates and secondary positions within their respective state.*

Northwest Land-Grant Institutions	2008-2009 AgEd Teaching Graduates		2009-2010 Secondary Ag Ed	
	f	Teaching Secondary Ag	Positions Available	Programs gained or lost
University of Idaho	7	4	5	0
Montana State University	4	3	14	+5
University of Nevada - Reno	0	0	3	0
Oregon State University	4	3	5	0
Utah State University	6	4	11	+4
Washington State University	7	6	15	+1
University of Wyoming	4	2	12	+2
TOTALS	**32**	**22**	**65**	**+12**

Table 2. *2009 – 2010 Northwest agricultural education secondary teaching positions. Where are these individuals entering the positions from within each state?*

Northwest States	Movers from		New Teachers from		Returning with experience	Alternatively Certified	**TOTAL Positions Filled**
	within State	outside State	within State	outside State			
Idaho	0	1	2	1	0	1	5
Montana	1	3	2	1	4	3	14
Nevada	0	0	3	0	0	0	3
Oregon	1	0	3	0	1	0	5
Utah	5	0	4	0	0	2	11
Washington	7	0	6	1	0	0	14
Wyoming	5	0	2	4	0	0	11
TOTALS	**19**	**4**	**22**	**7**	**5**	**6**	**63**

Conclusions

The graduates potentially could have filled only one half of the available openings. Another third of the positions were filled with movers and a tenth of the positions were filled with alternatively certified teachers. Without those being alternatively certified and returning with experience, there would have potentially been up to 27 positions not filled in the Northwest.

Implications/Recommendations/Impact on Profession

According to the three solution model (Roberts, Harlin, & Ricketts, 2006), option #1 and #3 are the best solutions. Option #1 refers to more students graduating, inferring that more students need to be pumped into the pipeline from high schools, community colleges, and from other majors within Colleges of Agriculture. Option #2 is not viable, because despite only 10 graduates not teaching secondary agriculture; they would not come close to filling all of the open positions. Option #3 is also viable because they address the alternatively certified teachers entering the profession to filling positions in agricultural education programs. Addressing each solution quickly and efficiently should produce impact on new teachers entering teaching.

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Perceptions of Instructional Methods in Biofuel Education of Secondary Students

Research Poster Narrative Proposal

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Perceptions of Instructional Methods in Biofuel Education of Secondary Students

Introduction

In recent years there has been a concern of diminishing petroleum reserves and future energy supplies (Akbas & Ozgur, 2008; Vasudevan & Biggs, 2008). Biodiesel is an efficient, renewable, biodegradable and 100 percent natural energy alternative to petroleum fuels (Akbas & Ozgur, 2008; Vasudevan & Briggs, 2008). Adequate curriculum should be developed and presented to students in order to impact their learning. According to the National Research Agenda (2007), there is a need to "systematically identify and develop instructional systems to meet industry needs" (p. 19).

Theoretical Framework

Lecture is the most common method of passing on information to students (Kindsvatter, Wilen, & Ishler, 1992; Waldron & Moore, 1991). Lecture method instruction allows for large concepts and ideas to be communicated to the student in a relatively short period of time. "Demonstrations have served as one of the most effective education tools ever developed" (Seevers, Graham, Gamon, & Conklin, 1997, p. 145). A demonstration allows students to see how something works or is used, operated, or performs (Kindsvatter et al., 1992; Phipps et al., 2008). Tinkering self-efficacy is a person's experience, competence, and comfort with manual activities (Baker & Krause, 2007).

Methodology

The purpose of this study, which was part of a larger study, was to determine if the [state] Secondary Biodiesel Education Program ([state] SBEP) over alternative fuels had an effect towards student interest. This study evaluated students' interest in the two methods used to present the ([state] SBEP), lecture and demonstration. Additionally, this study also sought to find if knowledge acquisition was correlated to students' tinkering self efficacy. This study sought to address the following hypotheses:

Ho_1: There will be no significant difference in student interest of presentation method after completion of the [state] Secondary Biodiesel Education Program.
Ho_2: There will be no significant correlation in students tinkering self efficacy and posttest knowledge scores.
Ho_3: There will be no significant correlation between students tinkering self efficacy and method used through biofuel education.

The instrument developed for this study was constructed from an intense literature review and measures the main construct found in the curriculum of the ([state] SBEP) over alternative fuels. The instruments development was also guided and reviewed by a committee of experts for face and content validity. The instrument was made up of two sections, a pretest and a posttest.

Findings, Conclusions, and Recommendations

By class, pretest knowledge scores ranged from 4.15 to 6.20 on the 18 item test. Mean scores for the pretest 18 question knowledge section were 5.12, 4.15, 4.55, 5.60, 5.75, 6.11, 5.62, and 6.20 respectively. The theoretically derived means for all class was 4.5. The percentage of pretest scores did not differ from the theoretically derived mean of guessing, χ^2 (7, N = 91) = 2.24, p > .94.

Null hypothesis one was tested using t-test analyses. There was a significant difference between student interest in method of presentation, t= -7.18, p < .05 (.0002). Based on these findings, null hypothesis one was rejected. Null hypothesis two showed a strong positive correlation of .73 between posttest scores and student tinkering self efficacy. The t value (t = 8.29, p < .0001) was significant at the .05 level and had an r^2 value of .53. Null hypothesis two was rejected. Null hypothesis three displayed a significant positive moderate correlation (Davis, 1971) between the two methods of instruction. Analysis of the upper and lower quartile of participants with respect to tinkering self efficacy and method of instruction revealed t (41) = -2.58 and p = .01. Null hypothesis three was rejected.

Through analysis conducted in this study, it is apparent that correct knowledge held by participants about biofuel is negligible. Data indicated knowledge held is low thus demonstrating the need for education about biofuel (Acker, 2008). It was found that students (N = 91) who held a positive tinkering self-efficacy score was positively correlated to post-test scores (r = .73) through the ([state] SBEP). Based on the high value of the Pearson Correlation Coefficient (r = .73), teachers should consider this finding when teaching based on factors noted in this study.

Findings of this study revealed that students tinkering self efficacy positively affected their perceptions towards method of instruction. Students with high tinkering self efficacy preferred the use of a demonstration method in the context of this study. Recommendations based on the findings of this study include using the demonstration methods when presenting material when deemed appropriate to gain student interest. This recommendation is further refined to include areas of study when classroom participants are heavily weighted towards male percentages based on their tinkering self-efficacy preferences.

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Research

Perceptions of Pre-service Agricultural Education Students Enrolled in a Model Integrated Course toward their Pre-service Experience and the Use of Integrated Curriculum

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Perceptions of Pre-service Agricultural Education Students Enrolled in a Model Integrated Course toward their Pre-service Experience and the Use of Integrated Curriculum

Introduction

Several studies conducted over the past few decades have highlighted the need for an emphasis on science and mathematics in education (National Academy Press, 1988; National Commission on Excellence in Education, 1983). As a result, the idea of integrating curriculum across disciplines quickly became an educational trend at all levels. Still, little research has been conducted at the postsecondary level to determine if teaching science in the context of agriculture is effective for undergraduates in agricultural education degree programs. Since approximately 32% of students drop out of college between their freshman and sophomore year, the integration of science and agricultural concepts may be most beneficial for those students taking 100 and 200 level courses. Integrated agricultural and science courses could provide these students with the opportunity to feel more engaged to their selected field of study earlier in their post secondary program.

In addition, pre-service agricultural education students may learn to value and carry out effective integration strategies in their pre-service field experiences by having been exposed to integration strategies in a pre-service model course that emphasizes the integration of multiple disciplines. Balschweid and Thompson (2000) suggest that pre-service programs should "foster opportunities for interdisciplinary teaching and learning that will create linkages for future endeavors" (p. 43). However many students find this difficult to do because they have never been exposed to effective integration practices. Wilson, Kirby and Flowers (2001) reported that pre-service teachers are more likely to integrate curriculum than in-service teachers and the best way to effect change in the profession is through coursework at the post-secondary level.

Theoretical Framework

The theoretical framework for this study lies in constructivism. Learning as constructivism suggests that cognitive abilities are acquired through social interaction and in an authentic context (Wiseman, Knight, & Cooner, 2005). This theory supports the need for *modeling* integration in pre-service teacher education programs as opposed to simply teaching pre-service teachers how to integrate curriculum in a traditional manner. In this course, the integration of technologies and the science behind them were carried out in course content delivery methods, activities and assessments. Technologies used in the agricultural industry served as the context for the course as well as the interrelated effects these technologies had on the different fields in agriculture. For example: an animal may be genetically modified to require less of a nutrient; however, the animal's waste may be altered in such as way that it is harmful for the environment and plant growth.

Methodology

A three hour, undergraduate, on-line course entitled "AEE 495 - Agricultural Biotechnology in Today's Society" that addressed trends and issues in biotechnology was offered during the spring and fall semester of 2009. The course was integrated to include the current applications of animal science, plant biology, and environmental biotechnology and was cross listed in the respective departments to encourage enrollment from the agriculture teacher education program.

Instructive materials were delivered using the learning management system Moodle which allowed for mass delivery through a collaborative effort from three faculty members in the aforementioned disciplines. Two voluntary surveys were administered to agricultural education students enrolled in the course prior to and at the end of the course using an on line surveying tool. The first questionnaire was a standardized university adopted sophomore satisfaction survey. Surveys were collected in a pre/post fashion to detect any changes as a result of taking the course. Student surveys were anonymous, but were asked for a unique moniker which was used to match pre and post surveys. Only those that could be definitively matched by the identifiers were included in the study. A second questionnaire, given only as a post survey, gathered the perceptions of the pre-service teachers in regard to how likely they were to integrate curriculum in their future agriculture programs. The objectives of the study were to:

1) Determine whether an integrated course would impact a student's propensity to remain in their degree program.
2) Ascertain if the course was an effective model for integrating curriculum for future teachers.

Results

The course was offered during the spring and fall semesters of 2009 with enrollments of 24 and 18 students respectively. Results from the sophomore satisfaction survey (n=25) revealed that students had a 4.2% higher satisfaction of their degree program after the course than they did beforehand. This increase was statistically significant (p=.006). The integration perceptions survey (n=16) highlighted that future agriculture teachers had positive perceptions towards integration, and were more likely to integrate curriculum as a result of the course. Respondents had a mean perception of 3.55 (4-point likert scale) on all integration items, including a mean perception of 3.43 on the item "As a result of this course, I am more confident in my ability to integrate science content into my agriculture curriculum".

Conclusions/Recommendations

Students who participated in an integrated agricultural biotechnology course at NC State University exited with greater satisfaction of their university degree program and a greater value of integrated curriculum. Agriculture teacher education programs should seek collaboration opportunities with other faculty in order to develop courses that take advantage of the strengths of multiple viewpoints and expertise. Additionally, these programs should better analyze the benefit of integrated curriculum and the effect it has on a student's propensity to remain in a degree program. In order to instill good integration practices into their future teachers, teacher education programs should offer coursework that models effective integration and collaborative techniques.

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Poster - Research

Perspectives on the Future of Rural Education in Nebraska

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Perspectives on the Future of Rural Education in Nebraska

Introduction

The landscape across rural Nebraska continues to operate from a consistent strategy of change. Many rural communities are faced with the issue of whether or not they can continue to support their local public school system. Thoughts of consolidation, re-structuring of school districts, low teacher pay and teacher shortages, and communities sharing resources with the hopes of surviving the current wave of cutbacks in state funding without raising local taxes has many citizens in rural areas operating in a mode of crisis.

Conceptual Framework

Public schools in rural communities are being forced in record numbers to either close their doors or consolidate with other, nearby districts in favor of larger, more economically efficient schools. “In 1930, there were more than 130,000 school districts [in the United States]. By 1950, the number had shrunk to 83,718; by 1980 to 15,625; by 1990 it was 15,500” (Ornstein, 1992, p. 322). This, coupled with the fact that the population of the United States has continued to increase, has created a situation in which fewer schools serve more students. Nevertheless, what is the driving force behind this effort to establish fewer, but larger schools?

However, the problem concerning the retention of young people extends beyond the traditional family farm. In rural communities, graduating students who see no future locally leave town, and a snowball effect begins. “These young people are no longer there to start families, to send their children to school, to buy toothpaste from the local druggist, or to buy houses from the local realtor. A “brain drain” leaves fewer high-quality workers to attract high-quality jobs. Fewer high-quality jobs mean even fewer opportunities for the next generation of students, who will find themselves forced by economic necessity to leave the community” (Christie, 2001, p. 425).

This study drew off the work of Bourdieu’s social theory and contextualized the concept of a “rural school” as a cultural field involving the resources such as economic, social, political, and academic factors (Bourdieu, 1991). Bourdieu (1991) acknowledges past traditions within various environments including linkages and relationships related to family interactions, social interactions, and educational experiences with a view of how these factors may play out in future interactions on how communities either thrive, maintain, or destruct.

Methodology

The specific objectives of the study were to:

1. Identify the beliefs rural citizens possess concerning an “ideal” outlook of rural public education in [State].
2. Identify the beliefs rural citizens possess concerning a “realistic” outlook of rural public education in [State].
3. Compare the “ideal” and “realistic” mean scores on the beliefs’ citizens possess concerning rural public education in Nebraska.

The population for this study consisted of all community members from a targeted rural [State] school district (N=200) consisting of two separate communities. This school district was selected to serve as a case study representative of other school districts and communities facing similar issues relating to community vitality and educational needs. Participants were surveyed through a Delphi approach (Borg & Gall, 1988; Rojewski, 1990) during fall of 2002/spring of 2003 with a total sample of 34 community citizens completing all three rounds of the Delphi procedure for consensus building (Sackman, 1975).

Results/Findings

Participants were asked to rank various responses related to the role the school plays in determining the sustainability of their community. Items were listed on a dual scale related to the responses as being "Ideal" and/or "Realistic" using the same Likkert scale (1=highly disagree, 2=disagree, 3=somewhat disagree, 4=somewhat agree, 5=agree, and 6=highly agree). The greatest discrepancies (greater than a 1.5 mean difference) between "Ideal" and "Realistic" occurred on 13 identified items. The top five differences between realistic and idealistic occurred on the following statements: 1) The state will devise a more equitable tax base than the current property tax system to shift the tax burden to those with the greatest buying power (realistic 2.78; idealistic 4.79), 2) Nebraska Senators realize the importance of rural communities to our state's economy and it will be reflected in state aid disbursements (realistic 2.31; idealistic 4.26), 3) Small schools will be closed (realistic 4.71; idealistic 2.76), 4) Student will have to travel farther to have access to a school (realistic 5.08; idealistic 3.21), and 5) Educational programs will be sacrificed in order to keep the school doors open (realistic 4.75; idealistic 2.94).

Conclusions

The critical thirteen responses demonstrating significant differences relating to the perceived Ideal and Realistic future identify key areas for improvement in rural communities in the near future. Decisions made in these areas could have the most profound effects on not only the future of public education in rural Nebraska, but also the general health of rural communities, and in turn could influence Nebraska's entire Agricultural-based economy. As the gap between what is realistic and what is idealistic grows, hope is diminished and a sense of helplessness invades the rural community, which affects a community quality of life.

Implications/Impact on the Profession

The implications to the agricultural education profession are devastating. In a time when we are trying to grow agricultural education programs to achieve of goal of 10,000 quality agricultural education programs by 2015, Nebraska is trying to keep open the doors of its rural schools where the vast majority of agricultural education program exist. The community members within this study have let their voice be heard. If state leaders in Nebraska are unable to listen to our rural citizens and change various economic factors related to state expenditures to secondary education, then we will be unable to contribute to the goal of 10 x 15 and ultimately the agriculture, food, and natural resource system will be unable to attract our agricultural education students into their professional fields.

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Innovative Idea

Produce Your Own: A Community Gardening Program

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Produce Your Own: A Community Gardening Program

Introduction/Need for Innovation

Interest in at-home vegetable gardening continues to grow at a rapid pace. The National Garden Association conducted a survey in 2008 with results showing that "43 million U.S. households planned to grow their own fruits, vegetables, berries, and herbs in 2009—that is up 19% from 36 million households in 2008" (National Gardening Association, 2009, p.4). Families concerned with healthier eating, along with the economic downturn, have been compelled to replace lawns with vegetable gardens. While some people have a natural green thumb, others need direction and education in order to reap the fruits of their labor.

<deleted> Outdoor Science School (-OSS) was originally founded in 1994 as a summer camp for youth. The goal was to create fun, hands-on, nature-based educational experiences. After 14 years, -OSS has grown into a year- round program offered in both local schools and outside of school settings. While youth remain the primary focus, -OSS has found the growing need to teach adults. Based on an informal needs assessment, gardening was identified as a top priority for adult programming.

Many County Extension offices offer an adult Master Gardener Program which includes advanced gardening training, short courses, newsletters, and conferences. The program focuses on building participants' gardening knowledge and skills to contribute to community growth and development (Schrock, Meyer, Ascher, & Snyder, 2000). However, with the comprehensive training provided in this program comes a large time commitment of 17-22 weeknight sessions (Young, 2007). Therefore, the "Produce Your Own" program was created to introduce adult participants to gardening in a similar manner, but with shorter, less demanding sessions.

How it Works

Gardening is a time-honored tradition that can be difficult to master in a place where winter is the dominant season. Produce Your Own was created to give a foundational introduction into the challenges of vegetable gardening in southwest <deleted state>. Scheduled in accordance with the growing season, this educational program consisted of a series of four interactive sessions focused on plot design, crop selection, garden maintenance, harvesting and preserving. Each workshop included guest speakers considered experts in their field and hands-on learning activities. Classes were held in the summer of 2009, approximately one month apart on four Saturdays from 9:00 am -12:00 pm. Specific program objectives were that participants will: (1) learn to plant and grow the ten "best" vegetable crops suited for the region (2) prepare a garden plot with seeds or seedlings from the local nursery, (3) demonstrate correct maintenance procedures for a home garden (4) increase consumption of locally or home grown produce over the next year, and (5) increase knowledge and skills in harvesting, cooking, and preserving vegetables.

The program consisted of three workshops and a farm tour. Workshops were developed to provide experiential learning opportunities that allowed participants and instructors to interact, discuss, and demonstrate gardening procedures. A brief description of each workshop and its activities are as follows: The *Planning and Planting Your Garden* session introduced the course, explained how to prepare a garden bed, included a lecture by a Plant Science Professor about seed selection and planting dates, and concluded with participants planting vegetable seeds and creating a plot design map; the *Natural Weed and Pest Control* session included a discussion by the Master Gardener State Program Coordinator and the owner of a local gardening store focused on USDA labeling regulations, integrated pest management techniques, organic and natural weed control, and the basics of composting; and the *Harvesting and Preserving Your Crops* workshop incorporated a demonstration with a local Chef, handouts with how to preserve or cook vegetables grown in <state>, and concluded with a hands-on cooking class made with participants' garden vegetables. The culminating *Local Farm Tour* brought concepts full circle as participants visited with local growers about production scale farming, garden design, greenhouse management, U-pick operations, cooperative farm business practices, and marketing and distribution techniques. Participants were also able to sample vegetables and take transplants home for their personal gardens.

Discussions were used at the beginning of each session to assess the knowledge and interest of participants. Participants were asked what they would like to learn from the sessions and what they already knew about gardening. At the end of each session, informal evaluations were conducted to measure learning and prepare content for future workshops.

Results to Date/Implications

A total of twenty-eight adults participated in program; however, a decrease in participation was seen after each workshop. There can be many explanations for this drop in participation, but the dates and times of the classes was the most common finding. Because <deleted state> has a short summer and growing season, participants indicated that they were less willing to participate in weekend programs. Informal evaluations also revealed that the majority of participants felt the registration cost was a fair price and would recommend the class to others.

Future Plans/Advice to Others

This program can be adapted in many ways for adults, seniors, youth, and other audiences interested in home gardening. As revealed, the dates and times when a program is offered can have a large impact on the participation. Offering the program during weeknights might help to increase participation for working adult audiences. In addition, because the sessions were spread throughout the summer months, many participants forgot about them, even though reminder emails were sent. Only one press release was used to promote the program. More frequent advertising would have likely increased participation in later sessions. Additionally, one-time panel discussions on a specific gardening topic could be designed to reach a broader, more diverse audience. Twiss (2003) concluded that the benefits of gardening "enhance nutrition and physical activity and promote the role of public heath in improving quality of life." (p. 1435). Expanding the program's audience and location to senior living homes, coffee shops, group homes, after-school programs, and community gardening sites could greatly increase the number of people introduced to the benefits of home gardening.

Cost/Resources

Cost was set at $10 per class or $30 if participants pre-paid for all four sessions. All materials for the hands-on portions of the class were donated by local businesses. Materials and resources used included soil, seeds, 4-packs, demonstration tools, handouts, and vegetables. In addition, every class had a raffle for a gardening related prize which were all donated by local businesses. Prizes included vegetable transplants, gardening tools, gloves, seeds, and a composter as a grand prize.

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Professional Development through Winter Technical Institutes: Agricultural Electrification

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Introduction

According to Phipps and Osborne (1988), a total secondary agricultural education program consists of three essential and interdependent components. Specifically, these components are: classroom and laboratory instruction; independent experiential learning, commonly known as Supervised Agricultural Experience (SAE); and participation in the student leadership organization, typically the National FFA Organization.

In the field of agricultural mechanics, laboratories are essential educational tools for student development. Johnson and [Author] (1989) stated that much of the instruction of the agricultural mechanics curriculum takes place in a laboratory setting. As such, a great deal of instructional time is spent in the agricultural mechanics laboratory. Phipps and Osborne (1988) estimated that in many courses, the time allocated for instruction in agricultural mechanics comprises 25% to 40% of the total instructional time. Shinn (1987) reported that the amount of time devoted to laboratory instruction may comprise one-third to two-thirds of the total instructional time in many agricultural programs. Furthermore, no one will dispute the fact that the use of a laboratory setting, where students can learn by doing, is a basic tenant of agricultural education programs (Sutphin, 1984).

In the curriculum area of agricultural mechanics, the basic objective for teachers is to foster the development of students' abilities to perform the mechanical tasks needed in agriculture (Phipps & Osborne, 1988). Johnson, [Author], and Stewart (1990) stated that students learn important psychomotor skills in agricultural mechanics education and that much of the instruction takes place in the school's agricultural mechanics laboratory. In order for teachers to effectively instruct agricultural mechanics curriculum to students, it is essential for them to be able to safely demonstrate these agricultural mechanics skills. Birkenholz and Harbstreit (1987) found that electricity skills were the third highest rated professional development need of [State] agricultural educators. Furthermore, in a 2008 study of [State] agricultural educators, electricity was one of the agricultural mechanics curriculum areas that teachers reported as having professional development education needs in ([Authors], 2009). With the continuing emergence of this agricultural mechanics area as a topic for professional development education by [State] teachers, agricultural education institutions and the professional development staff of the [State] [Department of education] should provide agricultural mechanics educators with professional development education opportunities to learn agricultural electrification skills and curriculum development techniques ([Authors], 2008; [Authors], 2009).

Methodology

As a result of a statewide agricultural education professional development study ([Authors], 2009), the Agricultural Electrification Winter Technical Institute was designed and implemented by the professional development staff of the [State Department of Education] to provide [State] agricultural teachers professional development education in the area of agricultural electrification. During this winter technical institute approximately 20 teachers received professional development education. Among the objectives of the winter technical institute were construction and wiring of a comprehensive electrical wiring board. Additionally, participants were required to learn electrical theory, electrical safety, and electrical circuit planning and installation. This activity and others provided the participants with the opportunity to learn, demonstrate, and ultimately develop agricultural electrification curriculum to further educate secondary, agricultural education students. At the conclusion of this winter technical institute, teachers received a comprehensive electrical wiring board and a wire size display board.

Results to Date

At the conclusion of the agricultural electrification winter technical institute, participants were asked about the benefits they received from the course. Specific comments from the participants included:

- “It was about the right amount of lecture and discussion…”
- “This was very helpful. It will benefit me in our Agricultural Structures class.”
- “Good instructions and good hands-on activities…”
- “The most beneficial part of the session were all the hands-on activities.”

Future Plans

The Winter Technical Institutes will continue to be an integral part of the professional development plan for [State] agricultural education. The timing of these winter technical institutes will be designed to meet the specific needs of [State] agricultural educators: after the conclusion of the National FFA Convention, before the end of the fall semester, and before the beginning of the preparation of career development event teams. The content for future winter technical institutes will be prioritized based on empirical professional development research concerning [State] agricultural educators and the availability of facilities and content experts.

Costs/ Resources Needed

The costs for these winter technical institutes vary depending upon the content provided. For the agricultural electrification winter technical institute, the administration costs and supplies were $84 per person. To adequately instruct this institute, the instructors required a laboratory with work tables, a variety of electrical hand tools, safety glasses, and a computer with projector. Handouts and consumable supplies such as electrical wire, wire nuts, etc. were needed as well.

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Research

PROFESSIONAL EDUCATORS' UNDERSTANDING OF AGRICULTURAL AWARENESS AND LITERACY IN A MID-WESTERN STATE

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PROFESSIONAL EDUCATORS' UNDERSTANDING OF AGRICULTURAL AWARENESS AND LITERACY IN A MID-WESTERN STATE

Introduction/Conceptual Framework

The agriculture industry has been very important for the United States and has "…fed, clothed, and provided building materials for millions of Americans…" (p.63) and people of other countries (Harris & Birkenholz, 1996). America's food and fiber systems determine the general welfare of its public (Leising, Pense, and Portillo, 2003). The American food and fiber system is "one of the greatest success stories known to man" (Pope 1990, p.57), and for the success story to continue it is essential that we have an agriculturally literate society (Law, 1990). According to the National Research Council (1988) much of the American general public is unaware of where and how the food they eat is produced, and about the significance of agriculture to the nation's economy, human and environmental health (California Department of Education 2005). A majority of Americans lack knowledge about agriculture (Blackburn, 1999). This lack of knowledge about agriculture presents a challenge to agricultural education (California Department of Education). In order to educate people about agriculture, it is important to determine what is the professional educators' understanding of the terms agricultural awareness and literacy. Their perceptions of what constitutes agricultural awareness and literacy could affect the educational programs they conduct. In this context, this study is significant.

Research focusing on agricultural awareness and literacy served as the framework for this study. According to Knobloch (1997) agricultural awareness may be defined as "experiencing or exploring agriculture as it relates to the subject matter being studied or context of life being lived; the ability to identify the connections of agriculture to areas of study or life" (p.12). Park (2008) stated that knowing the factual information about agriculture is awareness. Wright, Stewart, & Birkenholz (1994, p.55) stated that "The knowledge and perception of agriculture …" is referred to as agricultural literacy. According to Deeds (1991) agricultural literacy means having knowledge and competency in agriculture. The National Research Council (1988) stated that an agriculturally literate person will have "…practical knowledge needed to care for their outdoor environments, which includes lawns, gardens, recreational areas, and parks" (p.9). Frick, Kahler, and Miller (1991) defined agricultural literacy as "… possessing knowledge and understanding of our food and fiber system. An individual possessing such knowledge would be able to synthesize, analyze, and communicate basic information about agriculture" (p.52). According to Park agricultural literacy is something more and deeper than awareness.

Purpose and Objectives

The purpose of this study was to determine the professional educators' understanding of the terms agricultural awareness and agricultural literacy in a Mid-Western state. The specific objectives of the study were to: (1) develop common themes from the understandings of the educators regarding agricultural awareness and literacy, (2) identify the practices the educators were using to promote agricultural awareness and literacy, and (3) develop definitions for agricultural awareness and literacy based on the data generated.

Methods

A mixed methods design was followed. The population consisted of agricultural teachers, adult educators, and leaders in the agriculture industry in this Mid-Western State. It was decided that a sample size of 10-20 (5-10 agriculture teachers and 5-10 commodity board and extension professionals) would be appropriate for the study based on the scope and duration of the project. This research was conducted as a summer internship project. Twenty randomly selected participants were contacted via emails and telephone, and 13 agreed to participate in this study. The participants were personally interviewed and each interview lasted approximately 25-30 minutes. The interview schedule consisted of 14 questions: 11 open-ended and three close-ended. The questions were developed by a team of experts that included faculty, staff, and graduate assistants familiar with the subject.

Results

Field notes were duly developed after every interview. Codes were developed from the field notes, and later themes evolved. Member checks were done to account for any biases. The common theme that emerged was that the terms ‘agricultural awareness’ and ‘agricultural literacy’ are different but the definitions of the terms differed among the respondents. The common understanding was that agricultural awareness is a shallow understanding of the concepts, whereas agricultural literacy was a deeper understanding of the concepts. Some of the activities listed by the respondents under the agricultural awareness and literacy categories were: Food for America program, petting zoo, Farm Safety Day, Grow Cabbage program, Mid-Western State Fair, Pork Information Gateway program, websites, and use of mass media, State 4-H conference, FFA activities, and SAE activities. Some activities were listed under both categories. The respondents said their educational strategies would differ based on the need. Based on the data collected from this study, we define agricultural awareness as the basic interest and attraction to a topic in agriculture, whereas agricultural literacy is a higher form of education that engages the learner in comprehending principles and concepts related to topics of agriculture.

Conclusions, Recommendations and Implications

First, there was not a consensus of views as to the definition of the terms agricultural awareness and literacy. Secondly, all the educators except one felt that agricultural awareness and literacy are two different concepts. Third, different activities can be used to impart agricultural awareness and literacy to people at various levels of learning. But, in some cases the educators were using the same activities for both the agricultural awareness and literacy programs. Based on the findings and conclusions, it is recommended that the definitions developed for agricultural awareness and literacy be used to arrive at consensus definitions for the terms, and made available to the agricultural educators in this state. It is also recommended that these definitions be included in the course curricula at the elementary and middle school levels. The course curricula in elementary and secondary schools should be developed based on these definitions in such ways that the concepts impart interest in agriculture at the elementary level and knowledge and expertise at secondary school and post-secondary levels, respectively. Also, teaching strategies could be designed effectively if there is a consensus understanding of the terms. Also, it is recommended that this study be replicated in other states with larger sample sizes, and findings from those studies be used to strengthen the definitions developed from this study. The findings from this study could have implications to non-formal settings like Extension, also.

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Innovative Idea

Recruiting by Doing: Utilizing existing undergraduate student organizations to facilitate secondary student recruitment in agricultural teacher education

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Recruiting by Doing: Utilizing existing undergraduate student organizations to facilitate secondary student recruitment in agricultural teacher education.

Introduction/need for innovation or idea

Faced with an ongoing shortage of secondary agricultural educators (Kantrovich, 2007), the National Association of Agricultural Education (NAAE) initiated a campaign for National Teach Ag! Day (NAAE, n.d.). National Teach Ag Day is a component of the National Teach Ag Campaign, an initiative of the National Council for Agricultural Education. The essences of National Teach Ag! Day is to have a day devoted to celebrating the importance of what you do every day and to encourage students to follow your lead and consider a career in agricultural education. As part of the campaign, key stakeholders (secondary educators, postsecondary educators and pre-service teacher education programs) were asked to promote agricultural education and the opportunities available in teaching agriculture.

The Partnership for 21st Century Skills issued a report evidencing a gap in writing skills needed and writing skills obtained by high school graduates. Nearly three-quarters (72 percent) of incoming high school graduates are viewed as deficient in basic English writing skills, including grammar and spelling. In addition, in the same report employers reported 81% of their high school graduate hires were deficient in written communications (Partnership for 21st Century Skills, 2006). Dewey (1938) and Kolb (1984) believed that the students learn by thinking about what they experience.

To help develop experiential education opportunities, develop written communication skills, and identify potential future post-secondary students of agricultural education, the <university> chapter of Alpha Tau Alpha coordinated <state> agricultural education partners in conducting an incentive laden essay contest. *Alpha Tau Alpha* is the national professional honorary agricultural education organization for those who have chosen a major in agricultural education or extension education (Alpha Tau Alpha, n.d.). The stated purpose of Alpha Tau Alpha is "*to promote the highest standards of agricultural education and a more intimate acquaintance and closer relationship with individuals who have chosen a major in agricultural education or extension education*" (Alpha Tau Alpha, n.d.).

A natural opportunity seemed to exist for an honorary organization focused on academic excellence to facilitate an opportunity for current secondary agricultural students to "teach for a day". In cooperation with the <state> FFA Association, the Eta Chapter of Alpha Tau Alpha at <university> set out to answer the call of finding our future agricultural education teachers. They did this through the innovative idea of sponsoring a program where current secondary agricultural education students are able to teach a full class session to their peers. To be eligible for awards, the students were then required to complete an essay that answered the question of ***"Why Teach Ag? What I learned as an ag teacher for a day!"***.

How it works/methodology/program phases/steps

The student leadership team of <university> Alpha Tau Alpha determined that they would like to conduct an event in celebration of the inaugural Teach Ag! Day. After determining that an essay contest would best fit both the desires of recruiting students and the capacity of the organization to conduct an event, strategic partners were contacted to establish a participation incentive structure.

The <university> Alpha Tau Alpha encouraged <state> agricultural education teachers to identify a student to instruct their class for a day. The student was responsible, with their teacher's help, for preparing the lesson and delivering the instruction to any agricultural education class. Students were asked to submit an entry form, a reflective essay, an action photo of the student teaching, a photo of the student with their agricultural teachers, and finally a photo release form with necessary signatures. The reflective essay was limited to 500 words maximum. Students were given the prompt: Why Teach Ag? What I learned as an ag teacher for a day!

The student leaders created the following timeline for this new program: January 15th – Announce Opportunity; February – Students complete instruction in their high school (Note: Teachers were encouraged to consider February 25th, National Teach Ag Day, as a possibility); March 15th – Application Materials due to <university name>; June 16th announcement of winners (Note: this date was in concurrence with <state> FFA association summer conference).

Evaluation criterion was loosely based on the National Alpha Tau Alpha Essay contest for postsecondary agricultural education majors. To rank the essay, a scoring system was designed with 70% of the score based on content and organization of the essay and 30% of the score based on overall appearance (format, grammar, spelling, and/or typographical errors). Essays submitted will be reviewed by a panel with all identifying information removed to maintain anonymity in evaluation.

The incentive structure offered was as follows: 1st place - $100 gift card to National FFA; Registration for 2011 <state> FFA event, Teach Ag! T-Shirt, Teach Ag! Lanyard; 2nd place - $75 gift card to National FFA; Registration for 2011 <state> FFA event, Teach Ag! T-Shirt, Teach Ag! Lanyard; 3rd place- $50 gift card to National FFA; Teach Ag! T-Shirt, Teach Ag! Lanyard; 4th place -$25 gift card to National FFA, Teach Ag! T-Shirt, Teach Ag! Lanyard; Participation – Teach Ag! Lanyard

Results to date/implications

The solicitation for involvement has been sent to all 265 <state> agricultural educators in the 183 <state> agricultural education programs. Funding and support has been secured from the <state> FFA Association and the NAAE Teach Ag! Campaign Committee. Informal surveying has indicated a minimum of 30 students planning on making application by the March 15th deadline.

Future plans/advice to others

Names of students who participate will be added to a departmental recruitment database. Future evaluation will be conducted to determine correlation between participating in this activity and enrolling as an agricultural education major at <university>. Possibility exists of expanding this activity to include submission of video of teaching for evaluation and completion of a practicum skills portion performed during the June FFA event as part of a new career development event.

Costs/resources needed

While cost to other institutions will vary depending on the reward/incentive structure, costs to <university> for this inaugural effort were minimal. The <state> FFA association provided registrations for FFA activities included and the National Teach Ag! Grant covered costs of the FFA gift cards and the Teach Ag! T-shirts. Estimated final out of pocket costs to the student organization were less than $50.

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Innovative Idea

Recruiting Future Agricultural Education Students into the Teaching Profession: The Development of an AGED CDE

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Recruiting Future Agricultural Education Students into the Teaching Profession: The Development of an AGED CDE

Introduction/Need for Innovation

In recent years with retiring personnel and a lack of new prospects, agricultural education has faced a shortage of teachers (Kantrovich, 2007). Therefore, a need exists to recruit additional pre-service agricultural education students into the teaching profession to fill the vacancies.

One means for recruiting additional students into the agricultural education major is through the development of a career development event (CDE) for secondary agricultural education (AGED) students. Bandura (1986) discussed the influences and decisions made early in life begin to affect the choices an individual makes toward their future career. As such, the development of an AGED CDE would enable students to discover and explore the prospects of a teaching career.

On its most foundational level, the basis of a CDE is to help motivate, encourage and grow students into successful young individuals while offering insight to possible career fields in agriculture. CDEs should:

- Include problem solving and critical thinking;
- Promote an appreciation for diversity by reducing barriers to participation;
- Promote new directions and focus on future needs of members and society;
- Include cooperative activities, where appropriate;
- Encourage broad participation among members and recognize excellence within levels of experience;
- Recognize individual and team achievement, develop general leadership and recognize levels of ability;
- Provide local recognition for superior performance at the state and national level.

(National FFA Career Development Events Handbook, 2006)

Currently, the National FFA Organization sponsors 24 CDEs. However, none of these relate directly to agricultural education. So, where do secondary students learn about the agricultural education teaching option at the secondary level? With the growing need to fill the void produced by retiring agricultural education teachers, it is the time to explore new avenues related to student recruitment into the field of agricultural education. An AGED CDE could aid in that effort.

How it Works

A set of seven fundamental guidelines has been developed for the AGED CDE contest.

1. Contestants will create a lesson plan and teach a lesson on the assigned core subject area assigned at the release date of the topic (one month prior to the contest.). Lesson plans must be submitted to the superintendent one week prior to the competition.
2. Lesson topic shall be assigned from one of the following core subject areas: Food Products and Processing Systems, Plant and Soil Sciences, Animal Systems, Power, Structures and Technology, Natural Resources and Environmental Science, Agricultural Communications, and Agribusiness and Management.

3. Contestants will be provided with human interaction (i.e., a “class” of students will be provided at the contest in which competing students will teach).
4. The lesson will be a maximum of 15 minutes in length. A maximum of 5 minutes for questions and answers will be allotted.

Results to Date

A series of scoring rubrics has been designed for the three facets for the AGED CDE. Specifically, the CDE will be scored on three criteria: 1) Lesson Plan – overall structure and clarity, resources listed, punctuation, spelling, and grammar, activities planned, completeness of plan, and general appearance and layout (*100 points*); 2) Delivery of Lesson – structure and clarity of presenter, presenter’s oratory, effectiveness of teaching method used, and portrayal of effective teaching characteristics (*120 points*); 3) Questions – Students’ overall ability to answer questions related to core subject area, method used, and the teaching process (*30 points*); 4) Exam – Students will be tested in the area of teaching (*100 points*). Contestants will be ranked according to all four rubrics from high to low to determine a winner. Specifically, nine contestants have submitted lesson plans for the AGED CDE competition. Topics range from ear notching and scrapies to administering immunizations and learning about animal science careers.

Future Plans

The inaugural AGED CDE competition will be held November 2, 2009 at [State] land-grant campus. The Livestock Industry has been selected as the topical area for which students will plan and compete. Upon completion of the event, suggestions for improvement will be considered. Then, the event will be shared with the National FFA Organization with the hope of adding a national qualifying event in the future. Competing students will be sent letters of appreciation from departmental faculty to include valuable information about the agricultural education major and career (i.e., starting salary, plan of study, state agriculture teacher supply and demand, etc.) in an attempt to recruit students into the major.

Resources Needed

Three graduate students and one faculty member will serve as judges for the AGED CDE. Current [State] AGED majors (~5 per room) will serve as “students” for contestants to interact with if needed. Two rooms will be reserved for competition. Students will be split in half and randomly assigned to a room. Efforts have been made to establish inter-rator reliability among all judges. Further, an LCD projector and laptop computer will be supplied by the superintendent. Finally, plaques for first, second, and third place individuals will be awarded to the winners of the contest.

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Innovative Poster

Social Media and Small Businesses – Creating Marketing Strategies in the Digital Age

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Social Media and Small Businesses – Creating Marketing Strategies in the Digital Age

Introduction/Need

Marketing expert David Meerman Scott (2007) began his new book, *The New Rules of Marketing and PR*, with this sentiment: "There are many people who still apply the old rules of advertising and media relations to the new medium of the Web (sometimes referred to as Web 2.0), and fail miserably as a result" (p. xxiv). It's easy to observe the changes in media and see how underutilized new technology appears to be at times, but because the changes are so new, few businesses and individuals seem to know exactly how to adapt and take advantage of marketing opportunities created by Web 2.0.

Social media has been defined as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 and that allow the creation and exchange of user-generated content" (Kaplan & Haenlein, 2010, 62). Amidst the considerable debate in academic literature about the definition of Web 2.0, it has been defined as a "second generation" of web-based services that transforms web sites from static information to a participatory functionality, allowing for social networking in a casual fashion by end-users, and/or enabling improvements in technologies through the Web (Huang & Behara, 2007). Examples of Web 2.0 tools include Facebook, MySpace, LinkedIn, Twitter, Flikr, Blogs, Wikis, YouTube, web widgets, podcasts, newsfeeds, and virtual worlds. Numerous potential applications exist for such tools including research and development, marketing, sales, customer support, and operations management (Bernoff & Li, 2008).

This potential bodes especially well for small businesses in rural communities, which may have limited resources for marketing and limited markets constrained by geography. Rural areas, especially those that are economically dependent upon agriculture, mining, and manufacturing are losing jobs due to technological improvements in production and management (Goetz, 2005). In essence, rural areas are falling behind as a result of technology. Their ability to "catch up" may depend on the ability and willingness of small business owners in rural areas to adopt new technologies. This "second generation" of World Wide Web tools, which can bolster marketing and sales efforts of businesses regardless of geographic location, offer an opportunity for small businesses in rural communities to improve technologically and economically. The small, rural businesses that can adapt quickly and take advantage of Web 2.0 technology may find new opportunities for success that could have impacts on the local economies in which they exist.

Global social media use increased as much as 82% in 2009, and users spent an average of 5 ½ hours a month on social networking sites such as Facebook & Twitter (The Nielson Company, 2009). A recent survey by Frost and Sullivan (2009) found that while 80 percent of respondents personally used Web 2.0 technologies and 54 percent used them for professional purposes, only 40 percent of organizations formally used social networking and Web 2.0 tools. Few of those taking advantage of such technologies did so for customer relations, advertising, marketing, or business communications. Businesses with less than 100 employees or more than 1,000 employees use Web 2.0 tools less often than medium-sized enterprises. These findings, along with the obvious economic decline in some rural areas, suggest a need for educational research, programs, and products to assist entrepreneurs and small businesses in tapping into these valuable resources.

New versus Old Marketing Communications – How it Works

Faculty at [University] and the [state] Cooperative Extension Service have developed curriculum that introduces Web 2.0 tools to small business owners in rural communities. The program was based on four phases: a) Research, b) Curriculum Development, c) Pilot Program, and d) Training. As part of the training sessions small business owners were introduced to a comparison of new versus old marketing communication strategies. Some of those comparisons included: a) One-way vs. two-way or multi-way communications; b) Advertising as interruption vs. informational ads as the main attraction; c) General audiences vs. highly specified “niche” audiences; and d) Reliance on journalists vs. reliance on online content and bloggers.

Having a Web site isn’t enough -- Sites must contain information that audiences seek and must be extremely “findable” (search engine optimization is a must). Additionally, sites must be interactive and should contain useful information that satisfies needs (i.e. blogs, RSS feeds, educational podcasts, special promotions, online shopping or ordering). In terms of social media use, businesses must understand why people use social media (to feel [and be] connected to others. Furthermore, successful social media efforts cater to this need first and integrate marketing efforts second. (Example: Coffee house tweets to customers about what bands are playing this week so customers remain “in the loop”). Finally, customers demand to be entertained while being informed. A small business should strive to be viralous (i.e. viral YouTube videos, viral blog posts, viral emails).

Results to Date/Implications

Social Media content (blogs, RSS feeds, wikis, Flikr, YouTube, Twitter, LinkedIn, Facebook) was delivered through five workshops, which included seminars and hands-on demonstrations. This poster will highlight content delivered, social media adaptation by small business owners, and strategies for small business owners to improve marketing efforts through social media use. This project has provided an opportunity for small business owners to improve marketing strategies through effective implementation of social media. Insight from this project has the potential to impact Extension, education, and communication strategies and education in multiple states.

Future Plans/Advice to Others

Future plans will focus on determining if participants integrated their newly acquired Web 2.0 skills in meaningful ways into their marketing efforts. Also, Extension educators in [state] and nationwide will be trained to facilitate similar workshops using the curriculum developed as a result of this project. An online course will also be available. Materials will be available through a variety of media, including eXtension and several Extension-related Web sites. This type of relationship can be implemented with any industry interested in furthering their use of technology, while providing industry with information, experiences, and skills that are valuable to the promotion, marketing and longevity of their businesses.

Costs and Resources Needed

This nine-month project had a budget of slightly less than $25,000; nearly half supported labor for curriculum planning and development, and travel and supplies for the training seminars. Two Extension faculty and two university faculty were involved in this project and assisted in the curriculum development phase, pilot delivery, and evaluation.

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(Innovative Idea poster)

SPARK: Lighting up student learning in knowledge translation and transfer

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SPARK: Lighting up student learning in knowledge translation and transfer

Introduction/need for innovation

A growing need to inform individuals about agricultural practices and issues has prompted an increased focus on developing agricultural communications and extension skills (Agriculture and Agri-Food Canada, 2007). The agriculture and food sector's connection to new knowledge is deeply rooted in what has traditionally been known as extension, and more lately, in an emerging discipline called knowledge translation and transfer. This is the process of converting scientific and technological advances into marketable goods or services (Agri-Food Tech Transfer eNetwork, 2010). The *National Research Agenda in Agricultural Education and Communications* (Osborne, n.d.) emphasized the need for agricultural communicators to effectively disseminate information that leads to informed decision making. Knowledge translation and transfer emphasizes the synthesis, exchange, and application of knowledge with the dissemination of research results as the final activity (Ontario Ministry of Agriculture, Food and Rural Affairs, 2009).

Now, it is possible to be involved in knowledge translation and transfer as an undergraduate. At the University of Guelph, Canada's leading agricultural university with approximately $120 million in annual agricultural research funding, students have been engaged in knowledge translation and transfer of that research for 20 years. The focus of their efforts is a student research-writing, experiential-learning program called Students Promoting Awareness of Research Knowledge (SPARK). The program was catalyzed by the university's desire to increase its external communications about agri-food research. The university hired a professional journalist to initiate the agri-food research communications process; the journalist then started SPARK at the request of students at the campus newspaper who yearned for a science-writing experience.

How it works

SPARK is a non-academic program in which participants are paid to write stories about University of Guelph research. SPARK aims to make participants more employable by helping them acquire superior skills in journalistic writing, editing, photography, social communication, and videography (University of Guelph, 2010). Students work in a 600-square-foot newsroom-like setting centrally located on campus, in the university's Office of Research. The newsroom set up mimics a realistic newsroom, with the SPARK coordinator serving as editor at the center of the room (or "rim"), flanked by nine reporting stations. Program funding to support students' time is generated through service projects, such as writing stories mainly about University of Guelph research for commodity publications. Other projects include shooting research videos and recording radio briefs for commercial and non-profit websites, television program and radio stations, and producing externally oriented publications for various university departments.

Students in all disciplines with an aptitude for communication are invited to participate in SPARK. Recruitment occurs by word of mouth from current and former SPARK participants, referrals from staff, students and faculty, and by invitation to students enrolled in two undergraduate agricultural communications classes. Prospective participants are interviewed and required to complete a writing exercise, which consists of rewriting a poorly written news release from an external source.

Successful applicants receive a contract for an agreed upon number of hours per week, ranging from five- to 20 hours, depending on their availability and SPARK's requirements. Participants receive a 10-page handbook with advice on matters such as researching a story, interviewing, organizing a story, journalistic style and editing. The SPARK coordinator and the research communications unit director (and other specialists where needed) offer periodic workshops for writing and journalistic skills, such as choosing an angle, writing objectively, transition, interviewing techniques and video editing. When participants are acclimated to the writing process, they are given approximately 10 hours (from assignment to final draft approval from the researcher) to complete a 500-word story.

Results to date/implications

Approximately 200 students have participated in SPARK since its inception. In the past 20 years, SPARK writers have generated miles of print news stories and weeks' worth of audio and video news stories. In 2009 alone, SPARK writers wrote 97 stories and produced 24 videos. Stories are published widely, particularly off campus, in trade publications, newspapers and magazines. They also appear in university corporate or institutional publications with an external focus, particularly the University of Guelph *Research* magazine. Many former SPARK writers now work in agri-food communications capacities as writers, editors and administrators.

In December 2009, two two-hour focus groups were held on the University of Guelph campus with former SPARK participants and stakeholders (media, administrators, employers etc.) to gather data for a model for SPARK. This model has now been created as the focus of a doctoral dissertation. It graphically underlines the intrinsic need for five elements in a knowledge translation and transfer environment involving students: support from faculty, support from administration, support from the agri-food sector, a ready supply of students, and mentors to guide them.

Future plans/advice to others

Students' participation in knowledge translation and transfer can enhance information dissemination to stakeholders and improve knowledge uptake. SPARK provides students with new learning opportunities and enhances their employment potential. It can also help consumers better understand agri-food processes and research, through clear communication in broadly understood terms. The value of experiential learning in agricultural education has long been recognized as an important part of the educational process. This model offers a template for others who are interested in a SPARK program, which may help alleviate pressure on extension offices that are unable to replace retired employees or hire new full-time workers.

Costs/resources needed

Students are paid a wage comparable to other part-time workers in Ontario ($11-$14 per hour). They require a place to work, preferably in the Office of Research so they are close to research administrators. They should be equipped with hardware and software used by modern communicators: a high definition video camera ($750), a quality digital 35 mm camera ($500) and an Apple Macintosh computer and software for video editing ($2,500).

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Student Interest Survey in an Interdisciplinary Undergraduate Minor in Leadership Studies

by

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Student Interest Survey in an Interdisciplinary Undergraduate Minor in Leadership Studies

Introduction

Development of leadership skills and abilities among students has been cited as a primary goal for many institutions of higher education (Cress, Astin, Zimmerman, & Burkhardt, 2001). Although, colleges and universities have begun to devote resources to promote and enhance leadership development, most of the resources have been directed toward a select few students. Leadership development programs often consist of workshops or weekend retreats that engage students in developmental activities and may include elements of self-reflection. Although individual leadership skills may be improved through such experiences, providing instruction to students about foundational leadership theories and principles is a critical feature that distinguishes between leadership development and leadership education. The American College Personnel Association suggests that the goal of leadership education involves improvement in student (a) cognitive knowledge of leadership theories, (b) leadership skills such as conflict resolution and interpersonal communication, and (c) clarification of personal values.

> *These outcome goals are consistent with the American College Personnel Association (ACPA) Student Learning Imperative which includes the assumption that learning, personal development, and student development are inextricably intertwined and inseparable and that the hallmarks of a college-educated person include cognitive skills, practical competence and the ability to apply knowledge , and understanding and appreciation for human differences, and a coherent sense of self within a societal context.* (ACPA, 1994)

Leadership is a complex concept that encompasses a range of topics from individual self-assessment of personal qualities and traits to issues of ethics in exerting leadership in groups and organizations. Leadership is an on-going, developmental process, and leadership education programs in higher education have emerged to educate and motivate students to begin the life-long process of developing their leadership skills with the goal of continuous self-improvement (Eich, 2008). The Ohio State University recently considered a proposal to establish an interdisciplinary, undergraduate minor in Leadership Studies for students with a genuine desire to improve their leadership knowledge and skills through education, experience, and reflection. Cress, et al. (2001) acknowledged that there is "*. . . a strong indication that leadership potential exists within every student and that colleges and universities can develop this potential through leadership programs and activities.*" (p. 23).

Theoretical Foundation & Conceptual Framework -- This research is based upon Kolb's (1981) experiential learning model which suggests that new learning can be initiated in one of two ways; by doing something (concrete experience) or by thinking about something (abstract conceptualization). Kolb's model suggests that learners then process information either by reflecting on the experientially-derived information (reflective observation) or by applying the cognitively-derived information (active experimentation). Leadership education may employ either or both paradigms by planning learning activities based on concrete experiences of students and/or introducing abstract principles or concepts for reflection, to be followed by experiential applications. Komives, Lucas, and McMahon (2007, p. 5-6) emphasized the importance of the interpersonal dimension of leadership based on three basic principles: knowing yourself, how change occurs, and why others may view things differently; being ethical, principled, open, caring, and inclusive; and doing acts that reflect socially responsible behavior, participating in a community, and acting consistently and congruently on commitments and passions.

Methods – The population of interest in this study included undergraduate students at Ohio State University who had an expressed interest in leadership. Students were identified from a variety of campus sources that offered leadership programs for undergraduate students. A frame of 996 students was compiled which comprised a census of the undergraduate student population at Ohio State with a known interest in leadership. A data collection instrument was developed, based on the course topics and learning outcomes included in a proposed interdisciplinary, undergraduate minor in leadership. Respondents were asked to report their level of interest in enrolling in a leadership course that addressed each of the proposed course topics and learning outcomes. Respondents were also asked to provide information related to their potential interest in a leadership minor. Demographic items were also included to assist in the interpretation of the results.

Results/Findings – Responses were collected from 278 students which resulted in an overall response rate of 28%. These results should not be generalized beyond those who responded to the survey. Even so, over half of the students reported an interest in 13 of the 16 leadership topics. Leadership topics of greatest interest focused on areas of personal leadership including self-management, assessing personal strengths, group problem solving, developing a personal leadership philosophy, and team building through service learning. Three leadership topics of least interest to the respondents were theoretical in nature. Overall, three-fourths ($n = 170$) of the respondents reported an interest in an undergraduate leadership minor with the greatest number of students from career fields in the health sciences, business, and education. Previous leadership experiences in high school primarily focused on student organizations and athletics; whereas student organizations were the primary venue for gaining leadership experience in college. Over 80% of the respondents reported a cumulative GPA above 3.0, with 57% of the respondents above the 3.30 GPA level.

Conclusions – A majority of the undergraduate students responding to this survey indicated at least some interest in pursuing a minor in leadership. It appeared that academically talented students expressed a strong interest in pursuing a leadership minor. Students from a broad range of career fields expressed an interest in pursuing a minor in leadership. There was also wide variability in the range of leadership experiences that the respondents had engaged in during high school and college.

Implications/Recommendations

Based on results of this survey, undergraduate students at Ohio State are interested in an undergraduate minor in leadership. Therefore, these results were used in the rationale and justification for proposing an undergraduate, interdisciplinary minor in Leadership Studies at The Ohio State University. The proposal is currently under review by the Office of Academic Affairs at Ohio State may be approved as early as March 2010.

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Innovative Idea: Poster Submission

Student Teaching Capstone Expedition

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Student Teaching Capstone Expedition (Innovative Idea)

Introduction/need for innovation or idea

At the conclusion of their field-experience, student-teachers returned to campus for finals week at the University of Idaho. During the week, the faculty and the student-teachers met to debrief and reflect on their classroom experience and to prepare for graduation. While the finals week meetings were productive, they tended to be monotonous and mundane.

In order to improve the student-teachers' attitudes and enthusiasm for their final week of their undergraduate work, the teacher educators undertook a total redesign of the finals week sessions. The teacher educators replaced the classroom reflection sessions with a three-day "Capstone Expedition" to allow for more authentic reflection and discussion of their experience, visit different secondary agriculture programs and production agriculture businesses, and discuss their future careers as high school agriculture teachers.

How it works/methodology/program phases/steps

The goals of the student teaching capstone journey were to:

- Utilize driving time to discuss, debrief, and reflect on their recently completed student teaching experience.
- Visit quality secondary agriculture programs in different settings (rural, urban, and suburban), with different curricular focus areas (horticulture, natural resources, fruit production, etc.) and varying student demographics (urban, non-agriculture, ethnic).
- Address program challenges for recently hired teacher candidates.

This idea grew out of the cohort approach utilized by the teacher education program. "…contemporary research suggests that learning about teaching develops through participation in a community of learners where content is encountered in contexts in which it can be applied" (Darling-Hammond & Bransford, p.405). Eight programs in a neighboring state were identified by "seasoned" teachers within the state. Each program was contacted several weeks in advance and all allowed our group to tour, probe, and observe instruction. All eight programs were new to the student teachers and teacher educators. The programs greatly varied in community and school size, agricultural emphasis, and program focus.

A list of questions guided legs of the trip and were summarized and shared between the vehicles as we unloaded at the next destination.

- Instructional planning; in terms of flexibility, how was your performance affected, and did you meet the goals and objectives of your lessons/units?
- Discipline; did the students find your buttons? How did your clarity, consistency, and involvement of parents affect your discipline issues?
- What strategies worked for you to reduce disruptions and increase the FLOW of your time with your students?

- What strategies worked best for you in increasing motivation and engagement?
- What strategies worked best for you in developing rapport with students and building strong relationships with them?
- What strategies worked best for you in developing rapport with colleagues and community to build support and strong relationships?
- What were the highlights of your student teaching experience?
- Now that you've seen outstanding programs and have your student teaching experience behind you, what are the keys to building a total program?
- How do we develop a high quality program?
- How do we balance responsibilities of life and running the total program?

Assisting those student teachers who had already signed contracts identify facility and program issues that need to be addressed were priority areas for the expedition. After each visit the program's facilities and total program were discussed and the newly hired teachers' programs were considered for applying these new ideas.

Results to date/implications

After completing our inaugural capstone expedition, the teacher educators agree that it was a success, meeting their goals. The teacher candidates were appreciative of the opportunity to see another state's diverse agriculture production and for seeing such a diverse group of high quality programs. The teacher educators were encouraged to continue to stretch the future cohort's ideas of what agricultural education is and can be. The expedition provided an excellent opportunity to encounter new ideas and for the cohort to apply their learning to their new programs.

Future plans/advice to others

The teacher educators plan to rotate between neighboring states. Several of the teacher candidates were still in the job interview process during the expedition. Next year we will address the job interviewing and offering process before we load up and begin the journey.

A few teacher candidates expressed concern that they were never going to teach in the "other" state and didn't see the bigger picture of how running a highly successful program can be done other ways than what they were accustomed to. A recommendation would be to encourage the student teachers to plan the trip. This would increase participant ownership, keep engagement at a higher level, and hopefully reduce workload on teacher educators.

Costs/resources needed

The department covered the cost for vehicle rental, gas, and hotel rooms totaling roughly $700. In addition, two faculty members time were allotted for the three-day trip across neighboring Washington.

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Research poster

Students' new media use as a basis for advancing agricultural communications curricula

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Students' new media use as a basis for advancing agricultural communications curricula

Introduction

Electronic media have become a primary mode of interpersonal and mass communication during the past decade (Kerawalla, Minocha, Kirkup, & Conole, 2008; Lipsman, 2007; Pfeil, Arjan, & Zaphiris, 2009; Smith, Salaway, & Caruso, 2009), with businesses in multiple industries responding to these trends by increasing their reliance on new media as marketing and public relations tools (Li & Bernoff, 2008). To better prepare students as business professionals and to meet students' expectations for learning as digital natives, instructors have begun incorporating new media and other technologies into curricula (Baird & Fisher, 2005-2006; Kerawalla et al., 2007; Pfeil et al., 2009; Smith et al., 2009). The purpose of this study was to describe students' use of selected new media as a foundation for advancing agricultural communications curricula to better prepare students for evolving social and workplace demands. Objectives of this study were to 1) describe students' use of Facebook, including levels of activity, network members, and use for college courses; 2) describe students' use of LinkedIn, including levels of activity and network members; 3) describe students' use of Twitter, including levels of activity and network members; 4) describe students' use of blogs, including amount of time spent blogging and reading other blogs; and 5) describe students' preferences for use of selected new media in an agricultural communications course.

Conceptual Framework

Trends in the adoption of new media reflect the basic human need to connect with other humans (Li & Bernoff, 2008), as well as the human desire for social capital, or resources created by the connections within social networks that are beneficial to members of the networks (Ellison, Steinfield, & Lampe, 2007). Reasons often identified for using new media include maintaining friendships; making new friends; yielding to social pressures; paying it forward; and following creative, altruistic, inquisitive, and social impulses (Kerawalla et al., 2008; Li & Bernoff, 2008; Pfeil et al., 2009; Smith et al., 2009). The social technographics profile (STP) explains the steadily increasing use of new media (Foregger, 2008; Fox, Zickuhr, & Smith, 2009; Pfeil et al., 2009; Smith, 2009; Smith et al., 2009) to meet these needs by grouping new media users based on their activities (Li & Bernoff, 2008) in a structure similar to Rogers' (2003) theory of adoption. Rogers (2003) placed adopters of technology into the categories of innovator, early adopter, early majority, late majority, and laggards. In comparison, new media users are placed into one of six STP groups: creators, critics, collectors, joiners, spectators, and inactives (Li & Bernoff, 2008). Creators produce electronic media, while critics comment on content. Collectors save electronic media created by others. Joiners maintain a profile on at least one new media site and may visit multiple social networking sites. Spectators watch, read, or listen to electronic media without producing their own content or providing feedback on content produced by others. Inactives do not participate in new media use (Li & Bernoff, 2008).

Methodology

Students' use of selected new media, including Facebook, LinkedIn, Twitter, and blogs, was examined using survey methodology. The target population included 60 students enrolled in an upper-level agricultural communications service course at a land-grant university. The paper-based questionnaire was developed through a review of course curricula and literature describing new media use. A panel of experts established face and content validity of the instrument. A post-hoc reliability analysis performed on scaled items included in the questionnaire produced a Cronbach's alpha of 0.90. Fifty-five students completed the survey, which was administered during a 15-minute portion of the first course lecture after the university drop-add deadline had passed. Descriptive data were used to interpret and describe students' responses.

Findings

The majority (86.7%) of respondents were classified as juniors or seniors, with majors in animal science (34.5%), agricultural education (29.1%), agribusiness (20%), agricultural economics (5.5%), natural resource ecology and management (5.5%), agricultural leadership (3.6%), and food science (1.8%). The majority (85%) of respondents reported having a Facebook account. However, all respondents indicated they did not have accounts with LinkedIn, and nearly all respondents reported they did not have Twitter accounts (92.7%) or blogs (96.4%). Respondents reported the highest levels of activity on Facebook for viewing friends' photos, followed by viewing friends' profile updates, sending messages and/or writing on friends' walls, uploading photos, updating profile information, and reading friends' notes. Respondents' Facebook networks did not include broadcast media outlets (97.9%), print media outlets (91.5%), other news services (89.4%), university news services (74.5%), professional contacts (66.0%), and professional organizations (55.3%). Facebook was rated low as a communication tool for courses. In addition, respondents' indicated low levels of preference for the use of blogs and Twitter as assignments.

Conclusions

The use of selected new media, particularly Facebook, by the respondents is consistent with other studies of college students (Li & Bernoff, 2008; Fox et al., 2009; Pfeil et al., 2008; Smith et al., 2009), although the majority of respondents' participation in at least one type of new media does conflict with reports that about one-quarter of college-age students are inactives (Li & Bernoff, 2008). Respondents' reported levels of activity on Facebook support Li and Bernoff's (2008) description of college-age new media participants as being primarily spectators, as respondents reported the highest levels of activity for viewing friends' content. Respondents' Facebook activities also could classify them as critics and creators, with spectators and critics more strongly represented than creators. The low value placed on the use of Facebook, blogging, and Twitter in coursework does agree with other studies that reported college students prefer face-to-face contact and moderate amounts of technology incorporation into curricula (Boyd, 2006; Kerawalla et al., 2008; Smith et al., 2009).

Recommendations and Implications

This study demonstrated that college students enrolled in the selected agricultural communications course are frequent users of certain types of new media but may not be familiar with or comfortable with using other types of new media. Incorporation of new media into curricula should be planned with attention to students' experiences and preferences in combination with the use of new media in various professions. Assignments involving new media should include detailed background and instructions for using the selected media, as well as examples demonstrating the use of new media in careers related to students' education. Meeting these needs will be vital to strengthening students' preparation to face constantly evolving technology throughout their careers and contribute successfully to the development of social capital on personal and professional levels.

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Research

Students' Perceived Value of the Contribution of Instructional Methods Towards Understanding Risk & Crisis Communication

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Students' Perceived Value of the Contribution of Instructional Methods Towards Understanding Risk & Crisis Communication

Introduction/Need for Research

"An issue facing teachers of agriculture in higher education is providing quality instruction that meets the learning needs of students" (Garton, Spain, Lamberson, & Spiers, 1999, p. 11). To address this issue, educators choose instructional methods to meet the need of learners. However, many teachers struggle with choosing the most effective methods for knowledge acquisition. Rollins and Scalon (1991) discussed that "the educational community has devoted considerable effort to assessing the effectiveness of various instructional methods and teaching strategies. Research on teaching effectiveness has been *inconclusive in identifying a singular method of instruction* [emphasis added] that works well with all individuals" (p.48).

This challenge might be explained by the findings of Rosenshine and Furst (1971) who identified eleven teacher behaviors associated with student achievement. "Of the eleven teacher behaviors, five were identified that provided the greatest opportunity to influence student achievement" (Garton, Miller, & Torres, 1992, p. 10). As we seek to identify effective instructional methods, one teacher behavior that stands out is the use of a variety of methods and techniques.

The purpose of this study was to examine students' perceived value of instructional methods in contribution towards their understanding of and confidence in risk and crisis communication. The following research objectives were used to address this purpose: 1) determine students' perceived benefits and influence of different instructional methods used and 2) determine students' perceived degree of confidence for completing tasks associated with risk and crisis communication. This purpose aligns with the *National Research Agenda for Agricultural Education and Communication* (Osborne, n.d.) that has research priority areas for Agricultural Education in University and Postsecondary Settings which include "improving the success of students enrolled in agricultural and life sciences academic and technical programs" and "assessing the effectiveness of educational programs in agricultural and life sciences."

Framework

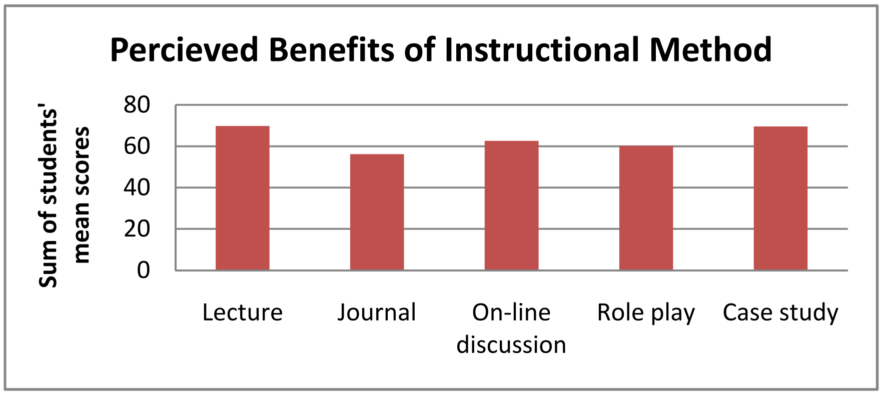
The conceptual framework for this study is hinged on classroom teaching model developed by Mitzel (1960) and is expanded by the theoretical works of Dunkin and Biddle (1974). The model contains four classes of variables: presage, context, process, and product. When considering classroom interaction, the behaviors and strategies of the teacher lead to observable changes in the student behavior (process) and in turn, immediate student growth and long-term student effects (product). This study revolves around these process and product variables as it focuses on the instructional methods of the teacher (process) and the understanding and confidence of students at the end of the course (product).

Methodology

The population for this quantitative study was graduate students enrolled in *Risk & Crisis Communications in Agriculture and Natural Resources* at [university] during the fall 2009 semester (N=17). During the course, Students were taught using a variety of instructional methods, including: lecture/discussion, weekly journal entries, online case study discussions, in-class role play, and team-developed case studies. The study utilized a 76-item end-of-term questionnaire to examine the students' perceived value of instructional methods in contribution towards their understanding of and confidence in risk and crisis communication. Items were measured using Likert type scales and degree of confidence scale. Reliability estimates for these scales produce Cronbach alpha scores ranging from .869-.987.

Results/Findings

Students' perceived benefits of each instructional method were averaged and summed to determine which instructional method students thought was the most beneficial. The two instructional methods that students found to be most beneficial were: team-developed case studies (Σ= 69.77) and lecture/discussion (Σ= 69.52). Students were also asked to mark which instructional method they perceived as having the greatest influence on their abilities. The results are as follows: 64.7% of students perceived lecture/discussion as having the greatest influence on their ability to understand and discuss crisis management and risk communication and 41.2% of students perceived team-developed case studies as having the greatest influence on their ability to increase their critical thinking skills as they relate to course content. Finally, students were also asked to determine which instructional methods had the greatest influence on your self-confidence as a future crisis communicator and 47.1% perceived team-developed case studies as having the greatest influence. Students were also asked to rate their degree of confidence in completing a variety of risk and crisis communication-related tasks. The mean score of the students' confidence to complete those items was 7.39 out of 10.



Conclusions/Implications/Recommendations

This study found students' perceived lecture/discussion and team-developed case studies as the most beneficial instructional methods used. These methods were also perceived as having the greatest influence on students' abilities to understand and discuss crisis management and risk communication, as well as, increase their critical thinking skills as related to course content. Although the largest number of students (47.1%) perceived the team-developed case study as having the greatest influence on their self-confidence, all five methods were identified by some students as having the greatest influence on their self-confidence as a future crisis communicator. The results of this study showed that students did not identify one singular instructional method as being most beneficial and influential, but found a combination of instructional methods influenced their self-confidence. Further study is encouraged to better understand the connection between instructional methods and students' degree of confidence. Additional studies should consider looking directly at students' perception of the benefits and influence of specific combinations of instructional methods.

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Research

Students' Self-Perceived Critical Thinking Skills in an Agricultural Ethics Course

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Students' Self-Perceived Critical Thinking Skills in an Agricultural Ethics Course

Introduction

Today's agricultural students are future decision makers who must tackle complex issues that affect human and environmental communities. It is increasingly recognized that a properly trained student will graduate with professional capacities reaching beyond technical expertise (Jordan et al., 2008). Many universities, academics, and researchers state that a key learning outcome of higher education is students' ability to think critically about and across subjects studied (Tsui, 2002) and transfer those abilities to job requirements (Pithers, 2000). Therefore, a key component of students' education must be the development of critical thinking skills.

Despite the need for critical thinking, researchers have often found low levels of critical thinking in students, regardless of assessment methods (Zascavage et al., 2007). Rudd, Baker, and Hoover (2000) found deficits in the critical thinking of agricultural students. Though critical thinking is often a stated educational goal, encouragement and development of critical thinking in university classrooms is rare (Browne & Freeman, 2000). Additionally, employers increasingly expect universities to better prepare students to think critically (AACU, 2007; NACE, 2008). Overall, the conclusion is that the university system does not consistently produce critical thinkers (Paul, 2005; Burbach et al., 2004).

Theoretical Framework

John Dewey is often credited with making distinctions in levels of thinking (Geersten, 2003). In the early 1980's, "the critical thinking movement gained momentum with research and theories from psychology, philosophy, and education" (Fasko, Jr., 2003, p. 6). Paul (2005) defines critical thinking as the "art of thinking about thinking in an intellectually disciplined manner" (p. 28).

One of the most prominent definitions of critical thinking identifies specific thinking abilities rather than taking a generalist perspective. Facione (1990) headed a consortium of experts representing a variety of academic disciplines who reached consensus on the definition of critical thinking (Delphi method). Their definition of critical thinking states "We understand critical thinking to be purposeful, self-regulatory judgment that results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based (p. 2)". The Delphi model includes six critical thinking skills and seven dispositions. The six core critical thinking skills are analysis, inference, interpretation, explanation, self-regulation, and evaluation.

In this project, we asked the following research questions;

1. Do students' perceived critical thinking skills change over the course of a semester?
2. How do students' pre-semester critical thinking skills compare to students' post-semester evaluation of their pre-semester critical thinking skills?

Methodology

We developed a self-evaluation of critical thinking skills specific to the course Ethics in Agriculture & Natural Resources. The evaluation contained 30 questions; 5 questions for each of the six Delphi critical thinking skills. Students rated themselves on a Likert-scale from 1 to 5, with the highest possible score of 150. Students took the self-evaluation three times. At the beginning of the semester students assessed their critical thinking skills. At the end of the semester students took the evaluation twice. First, students answered the questions as they saw their skills after the 16 week course. Immediately after completing the end-of-semester assessment, they were asked to re-evaluate their critical thinking skills at the beginning of the semester.

Demographics: A total of 39 students participated in the study. Twenty females and 19 males took the assessment. There were 15 seniors, 20 juniors, 3 sophomores, and one did not state their year in school. At both the beginning of the semester and the end, students' stated average grade point was 3.27.

T-tests were used to compare the mean response between 1) the beginning of the semester assessment and the end of the semester assessment, 2) the beginning of the semester assessment and the end-rating of the beginning of the semester assessment, and 3) the end-rating of the beginning of the semester assessment and the end of the semester assessment.

Results & Implications

Students' pre-semester responses were normally distributed between 90 and 120. At the end of the semester, students' responses were normally distributed and ranged from 80 to 120. Interestingly, at the end of the semester when students re-evaluated their beginning of the semester critical thinking skills the results were normally distributed and ranged from 50 to 100.

Students' pre-semester assessment was statistically different from their end of semester assessment (p=0.006). The pre-semester mean was 98.9 while the end of semester assessment mean was 94.2. This could indicate that students' critical thinking went down over the course of the semester, though more realistically, students over-rated their critical thinking skills at the beginning of the semester. Students' pre-semester assessment was statistically different from their end of semester rating of their pre-semester critical thinking skills (p=0.00). When students evaluated their pre-semester critical thinking skills at the end of the semester, the mean fell from 98.9 to 70.6 (p=0.00). When looking at the difference in students' critical thinking skills between their end rating of their pre-semester skills to their end skills, the mean rose from 70.6 to 94.0. This is an increase of 24 points.

These preliminary results elicit many interesting research questions. If students over-rate their critical thinking skills at the beginning of the semester, what is a more appropriate measurement? If the goal is to demonstrate an improvement in critical thinking, a more objective assessment tool will need to be developed for specific courses and subject areas. Does student self-assessment (and especially over-estimation) of critical thinking skills impact the learning process?

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Research Poster

THE EDUCATIONAL PROCESSES: RELATIVE IMPORTANCE TO EXTENSION EDUCATORS

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The Educational Processes: Relative importance to Extension Educators

Introduction

The Cooperative Extension Service (CES) uses various educational processes to meet the needs of people and improve lives (Seevers et al., 2007). Morse et al. (2006) stated that the needs of people have changed over the years with changing socio-economic and environmental conditions. In today's changing environment, it has become a challenge for the CES to succeed and communicate those successes to the public (Stone & Bieber, 1997). According to Cooper and Graham (2001), success of the CES largely depends on the professional skills and competencies of extension educators. Therefore, extension educators must develop educational process professional competencies to meet the changing needs of the clientele (Seevers et al., 2007). This study included four educational process professional competency areas identified as most important for the extension educators in the North Central Region of the United States by the NCR-158 Committee on Adult Education in Agriculture (Martin, 1991). These competency areas are: needs assessment and program development, learning systems, delivery systems and evaluation systems. According to the literature, there is lack of a comprehensive assessment of these four competency areas in the North Central Region. The purpose of this study was to determine the relative importance of 42 selected professional competencies as perceived by extension educators in the North Central Region and to identify when these competencies should be learned. These 42 professional competencies were grouped under the four educational processes professional competency areas mentioned above.

Theoretical Framework

The theoretical framework for this study is based on the theory of perception coming from research by Ferguson and Bargh (2004). They stated that social knowledge that is automatically activated in memory during the natural course of perception shapes and guides people's impressions, judgments, feelings, intentions, and behaviors.

Methods

The population for this study consisted of all extension educators working in the 12 states of the North Central Region from which 811 samples were selected randomly. The questionnaire was emailed to all participants using Survey-Monkey®. The response rate was 55%. A panel of experts reviewed the instrument for face, content, and construct validity and a pilot-study was conducted to establish the reliability of the instrument. The Cronbach's coefficient (α) of the instruments was .90. Respondent's perceptions were measured on a five point Likert- type scale ranging from 1- very low importance to 5- very high importance. The best time to learn the competencies was indicated by three different categories: graduate program, on-the-job and in-service program. Descriptive and inferential statics were used to compute the data using SPSS (17.0).

Findings

This study revealed that the extension educators perceived 81% of the professional competencies as highly important and the remaining competencies as moderately important. Respondents preferred to learn 41% of these competencies on-the-job, 33% in a graduate program and 26% of the competencies in an in-service program. Beyond the educational process professional competencies included in this study, some extension educators suggested their need to learn additional competencies such as people skills and organizational management. The findings from the study provided the basis to design a professional development model (Figure 1).

Conclusions, Recommendations, and Implications,

The findings of this study indicate a need for a professional development program based on the four educational process areas: needs assessment and program development, learning systems, delivery systems and evaluation systems. It is recommended that the professional development programs should be offered at one of the three levels of delivery – graduate programs, on-the-job and in-service workshops. The findings of this study have global implications for developing policies and guidelines for designing effective professional development programs related to the educational processes in extension. The best time to learn various competencies indicated by the extension educators in this study has important educational significance for designing professional development courses (1) in graduate programs at universities and colleges, (2) in in-service training programs of the extension service, as well as (3) for designing experiential learning techniques to assist extension educators to acquire these competencies while on-the-job. The findings also have implications for developing the educational process competencies of agriculture educators working both in K-12 and land-grant colleges mainly for: (1) identifying the learning needs of students in rapidly changing agricultural market situations, (2) planning learning programs and developing curricula that fit the changing needs of the marketplace , (3) delivering agricultural knowledge and information to meet the learning needs of students that can prepare them for the world of work, and (4) evaluating the impact of the teaching learning processes to determine whether the learning objectives were met as planned.

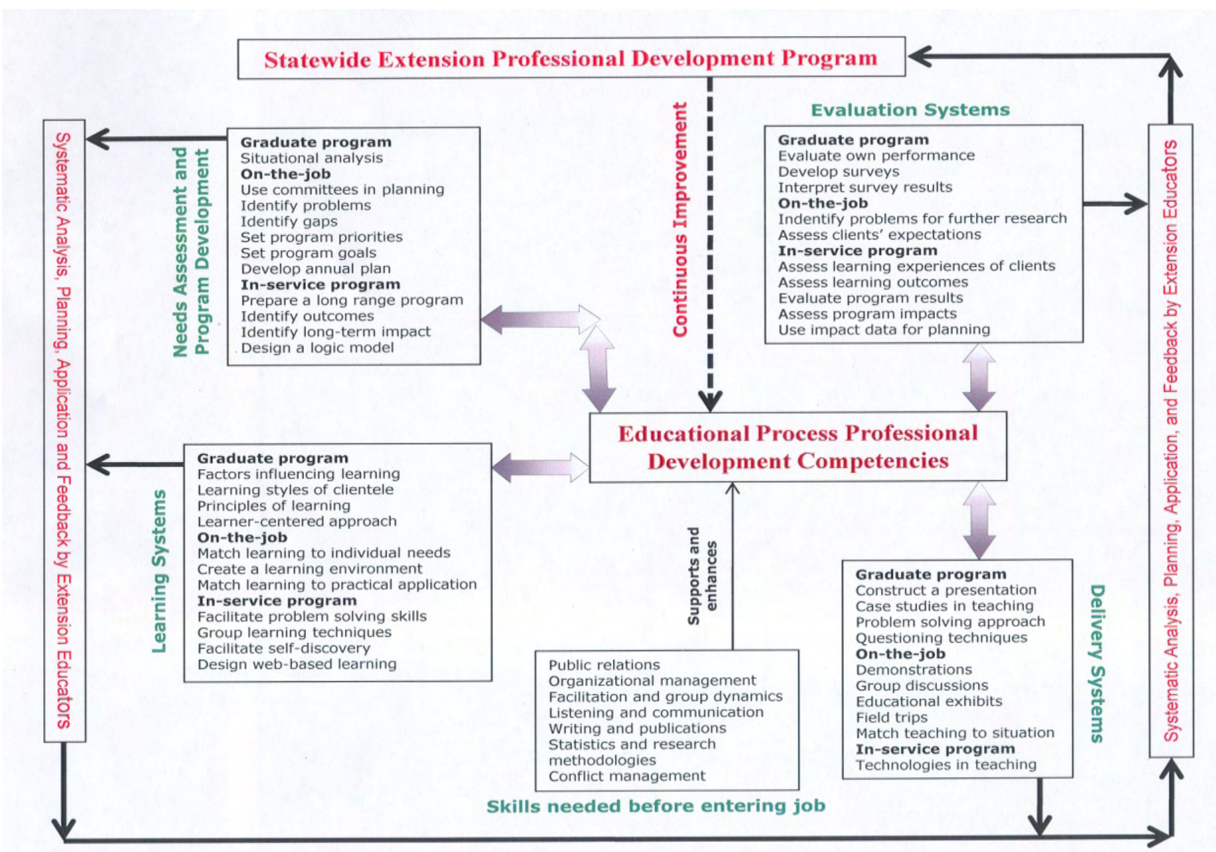

Figure 1: Educational process professional competency development model

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THE LEADERSHIP SPOT: A MULTI-INSTITUTIONAL, ONLINE APPROACH TO LEADERSHIP EDUCATION

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THE LEADERSHIP SPOT: A MULTI-INSTITUTIONAL, ONLINE APPROACH TO LEADERSHIP EDUCATION

Introduction/need for innovation or idea

Leadership is a process that involves interaction between two or more parties. Given the importance interpersonal interaction to leadership, social learning theories inform pedagogical approaches for leadership educators. Bandura (1977) established social cognitive theory which acknowledged the importance of meaningful learning experiences by emphasizing the dynamic interplay between the learner and the learning environment. Bandura also noted that observing peer models in the learning process provides rich learning experience for learners. Similarly, Vygotsky (1978) proposed that learning occurs first at a social level between learners and is subsequently recreated internally based upon the learner's pervious experiences. A key component of social learning models is that learning is situated in a socially–rich environment.

New media provide opportunities for leadership educators to utilize computer software and hardware to enhance learning environments. The use of internet tools will enhance teaching and learning with a generation of students who are increasingly using the internet as a primary source of information (Gupta & Meglick, 2008). Proserpio and Gioia (2007) labeled today's student "V-Gen" or the virtual generation. Up to 80% of 18-24 year olds have access to the internet and regularly use the internet for networking, relationship building, accessing news and research (Gupta & Meglich, 2008).

Internet resources continue to grow in both number and variation. Many classrooms in higher education use online classroom portals such as Blackboard® or WebCT®. Blogs, wikis and podcasts have grown in popularity in recent years (Richardson, 2006). Internet resources provided educators with the opportunity to construct an online social learning environment for students. While this online environment is often composed of students in one class at one institution, the focus of this poster is on an innovative approach which created an online learning environment of students from similar classrooms across two institutions. This learning environment is based upon Bandura's (1997) recommendation that peer models can provide a unique and power learning experience for students.

How it works/methodology/program phases/steps

Students were enrolled in an interpersonal leadership skills course at either the University of Florida or the University of Nebraska-Lincoln. Students were required to create and maintain a profile at The Leadership Spot website: http://leadershipspot.ning.com/. The Leadership Spot website utilizes social networking technology similar to Facebook to connect leadership students from both participating institutions. A total of four classes and approximately 90 students are utilizing The Leadership Spot online network. To date, the main use of the website has been through blogging, discussion forums, class updates, and queries to students at other institutions. These opportunities create a more open learning environment because students can view posted blogs, discussion forums, as well as each student's personalized leadership page from each institution and each class. This unique and dynamic online learning environment provides students with an opportunity to interact with students in similar courses at other institutions and other classrooms at the same institution.

In addition to the online learning environment, The Leadership Spot provides students with an opportunity to learn the technique of professional blogging. Students in each class are required to complete a number of leadership blogs throughout the course using the “What?”, “So What?”, “Now What?” model for leadership blogging (Gifford, 2009). Students are challenged to be creative and include photos, video and other design elements to enhance the visibility and allure of their individual blog. Students also have the ability to comment on other student postings and provide feedback and insight to students in similar courses despite the physical distance between institutions. The course instructor serves as the classroom group administrator and is able to monitor all activity.

This collaborative learning approach is unique from other classrooms introducing online interactions because it encourages students to interact and network on a national level. Students also have access to other professors and experts in the field of leadership development. The Leadership Spot offers students leadership resources, forum discussions and current leadership events. Anyone is welcome to join the Leadership Spot, but its intentional purpose is to assist leadership students in connecting with one another, sharing resources and ideas, and learning from information and experiences shared by peers.

Results to date/implications

Many assignments in the course are completed and posted on the Leadership Spot website. Students have taken advantage of the opportunity to be creative and have uploaded photos, video and current issues to their profiles as they relate to leadership development. Over 90 students are actively participating in the website. Approximately 50 individual blogs have been posted, 12 discussion forum threads have been utilized and countless one-on-one interactions have occurred. Students from each institution have responded positively to the online experience and have fully engaged in creatively and professionally utilizing the website. Ultimately, students are able to reflect on leadership experiences and apply course material in an online, social networking format with which many are very familiar.

Future plans/advice to others

Leadership education faculty are encouraged to consider using The Leadership Spot with their courses and participate in building an international online social network devoted to leadership education. Instructors can utilize The Leadership Spot to offer students networking opportunities and leadership resources as well as tools for blogging, discussion forums, polls, one-on-one interactions, and many others. The current faculty are maintaining an instructors group on the website to share ideas and best practices, provide tips to others and maintain a record trials and errors. The Leadership Spot will continue to be built into the objectives and pedagogy for those instructors currently using the website.

Costs/resources needed

There is no cost associated with use of the Leadership Spot website. However, faculty and students will need some time to devote to learning the intricacies and tools on the website and to maintain individual online profiles. Faculty may want to schedule an in-class “how to” session to familiarize students with the website.

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Research Poster

The Relationships between Instructional Efficacy and Motivational Orientations for Florida Master Gardeners

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The Relationships between Instructional Efficacy and Motivational Orientations for [State] Master Gardeners

Introduction/need for research

Master Gardeners are Cooperative Extension volunteers who deliver horticultural information from the land-grant institution to citizens across the state. Researchers should attempt to develop an understanding of what motivates adults to participate in Extension programs (Boyd, 2004). The Corporation of Community Service (2006) indicated one-third of volunteers terminate involvement within three years of service. Swackhamer and Kiernan (2005) recommended Extension utilize trained Master Gardeners in as many volunteer opportunities as possible for several years in order to get a good return on their investment. Flagler (1992) suggested researchers assist practitioners better utilize MG'ers in local programs by identifying adult motives to participate.

Theoretical Framework

The theoretical framework of this study was based on Bandura's (1993) self-efficacy theory and Houle's (1961) Typology. Bandura (1993) said self-efficacy was the degree to which an individual feels able to influence performance over an endeavor. High self-efficacy individuals are success-oriented and recover quickly from disappointments. Adults with low efficacy have less confidence in skills, and coupled with poor achievements discontinue service. Self-efficacy is correlated with motivation (Bandura).

Houle (1961) outlined three separate classifications known as goal-oriented, activity-oriented and learning-oriented to describe adults' motivations to participate in continued learning. Goal-oriented adults participate in an educational program due to the realization of their need for education or because they have identified a personal interest they want to comprehend to a higher degree. An activity-oriented adult chooses an educational program based upon the amount of social experiences with other adults. Adults who are learning-oriented perceive continued learning as a duty and believe pursuing education will better them.

The combination of self-efficacy theory (1993) and Houle's (1961) Typology relate to perceived self-efficacy and the pursuit of adult education. Both theories are used to explain why adults participate in the [State] Master Gardener program. The inclusion of instructional efficacy was important to understand as Master Gardeners serve as volunteer educators.

Methodology

The purpose of the study was to comprehend the effects of instructional efficacy and motivational orientations on [State] MG tenure. The study's objective was to describe any existing relationships between instructional efficacy and the motivational orientations of (a) Competence related Curiosity, (b) Community Service, (c) Interpersonal Relations, (d) Escape from Routine, (e) External Influence, and (f) Professional Advancement.

Quantitative research was selected as the research paradigm for this study. The study population was [State] Master Gardeners (N = 3,822) and researchers utilized stratified random sampling to select the population. A sample size of 613 was needed (Bartlett, Kotrlik, & Higgins, 2001). The researchers utilized the methods outlined by Dillman, Smyth, and Christian (2009) to increase response rate from participants when instituting a mail questionnaire. Six hundred thirteen participants were surveyed, and 530 participants returned their completed surveys to the researchers for an 86.79% response rate.

The questionnaire included seven questions regarding teaching efficacy from the Teacher Sense of Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001), 41 statements from Mergener's (1979) Education Participation Scale and 10 questions about participant demographics. Mergener's Education Participation Scale was based on Houle's (1961) Typology. The constructs within Mergener's Education Participation Scale were Competence related Curiosity, Interpersonal Relations, Community Service, Escape from Routine, Professional Advancement, and External Influence.

Findings

The study's objective was to describe any existing relationships between instructional efficacy and motivational orientations. According to Davis (1971) a correlation of +.10 to +.29 suggests a low positive association, and a correlation of +.01 to +.09 implies a negligible positive association. A significant low positive association existed between Community Service and Instructional Efficacy, r (525) = .25, $p < .05$.Competence related Curiosity and Instructional Efficacy exhibited a significant low positive relationship, r (525) = .23, $p < .05$. Interpersonal Relations and Instructional Efficacy exhibited a significant negligible positive association, r (525) = .09, $p < .05$. No other significant associations existed.

Conclusions

Instructional efficacy was correlated with each of Houle's (1961) motivational orientations (learning, goal, and activity). Respondents' instructional efficacy was correlated with Competence related Curiosity, Community Service, and Interpersonal Relations motivational orientations.

Implications/Recommendations

The correlation of motivational orientations and instructional efficacy adds to the Houle's (1961) Typology and Bandura's (1993) self-efficacy theory and better helps explain participant MG tenure by illustrating diverse facets effecting participation. Houle said adults participate in education for a variety of reasons. Bandura said individuals' self-efficacy affects the implementation of objectives and critical thinking. [State] MG coordinators should include more opportunities for participants to learn, serve the community, and develop social relationships due to those attributes positively affecting instructional efficacy. Learning-oriented participants possessed instructional efficacy and desired to share horticultural knowledge with fellow citizens. Goal and activity-oriented motivations were related with instructional efficacy too. Goal-oriented adults desired to teach the community horticultural information, and activity-oriented adults wanted to share horticultural knowledge in order to develop social relationships. Researchers should study instructional efficacy's relationship to motivational orientations in order to develop an understanding of adult tenure in MG. This study underscores the importance of providing training and preparation in instructional strategies for current and future [State] Master Gardeners due to diverse participant motivation. MG coordinators can focus program promotional material, and lessons to train and best prepare adults to be volunteer educators in order to meet the needs of these valuable resources and program clientele.

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RESEARCH

THE ROLE OF ANIMATION TOWARDS COGNITIVE ACHIEVEMENT

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THE ROLE OF ANIMATION TOWARDS COGNITIVE ACHIEVEMENT

Introduction

The National Research Council (1988) called for instructors to seek out and share technology-enhanced instructional material for agriculture to enhance student achievement. Learners of today are foundationally different from those who came before them in their methods of processing information and reasoning through issues (Prensky, 2001). Through the technologies available, teachers can transform the classroom from a “teacher-centered” to a “learner-centered environment” in an effort to adapt to students’ needs (Simonson & Thompson, 1997). “As agricultural education enters the twenty-first century, it must change with emerging trends in society and the agricultural industry,” (Talbert, Vaughn, & Croom, 2005, p. 61). Technology can aid in the hands-on experiences that agricultural education students gain traditionally while helping to reinforce student knowledge.

Theoretical Framework

Constructivism is defined as the act of learners creating an understanding through an experience (Fosnot, 1996). Dewey (1938) stressed his view that “sound educational experience involves, above all, continuity and interaction between the learner and what is learned” (p. 10). The Dual Coding Theory (DCT) was introduced by Allan Paivio (1971) as an approach to cognitive thinking, using both language (verbal) and imagery (nonverbal).Many students can be seen as lost in the classroom “of lectures, and technology may provide one possible key for revitalizing the lecture” (Gilroy, 1998, p. 5). Animations help in the visualization of abstract concepts through concrete representations and events (Wouters, Pass, & van Merriënboer, 2008; McGregor, 2002; Su, 2008). Edgar (2006) expressed the challenge of teaching abstract concepts of agricultural mechanization all-inclusively using only pictures, diagrams, chalk boards, and verbal explanations. Technological forms of instruction, like animation, may offer students an increased understanding of mechanical powers and science principles in agriculture (Dooley, Stuessy, Magill, & Vasudevan, 2000; McGregor, 2002).

Methodology

The purpose of this study was to determine if there was a significant difference ($p \leq .05$) in the cognitive achievement of students at the post secondary level when technology-enhanced instruction was incorporated. Based upon the research question, the following hypotheses were formulated to guide this study:

Ho_1: There will be no significant difference in cognitive achievement between students taught by technology-enhanced instruction compared with traditional lecture in the principles of operation of four-stroke cycle small gasoline engines.

Ho_2: There will be no significant difference in cognitive achievement between students taught by technology-enhanced instruction compared with traditional lecture in the principles of carburetion of four-stroke cycle small gasoline engines.

A quasi-experimental, counterbalanced design (#11) with internal replication from Campbell and Stanley (1963) was chosen for this study. Post-secondary students were purposively selected by their enrollment (N = 21) in the course of *Small Gas Engines and Turf Equipment* from *[University]*. Two separate lessons on theories of small gasoline engines were selected. Of the intact class (N = 21), one group (n = 10) was randomly chosen to serve as the control for the first lesson with the other serving as the treatment group (n = 11). The groups were switched for the second lesson, having each group serve as both a control (n = 11) and treatment (n = 10) through the counterbalance design.

Students were given a pretest two weeks prior to implementation of the treatment to measure knowledge. The pretest consisted of twenty general knowledge questions covering small gasoline engine operational theory; ten from both operation and carburetion. Immediately following each treatment, a posttest was administered. Data were organized and analyzed for each research hypotheses using SAS® 9.0 for Windows™ statistical package. Descriptive statistics were used to analyze the extraneous variable data. Inferential statistics were used to analyze data for testing differences using independent *t*-tests.

Conclusions, Implications & Recommendations

Participants in this study were predominantly male (76%), students seeking a degree towards agricultural education (74%) and classified at [university] as junior (63%) status. When administered knowledge pretest regarding small gas engine theory of operation, all participants averaged 67% out of a total 100%. Furthermore, a knowledge pretest was given prior to the lesson on principles of carburetion and students' scores resulted in a class average of 52% out of 100%. The researchers presuppose that although prior knowledge is held by participants, further knowledge should be acquired to meet specific class requirements.

Addressing hypotheses guiding this study resulted in implementation of traditional lecture for the control group participants and incorporating animations in the treatment group to determine the effects towards cognitive achievement. Analysis of data in comparing the two groups during the principles of operation of four-stroke cycle small gasoline engines revealed no significant differences between these groups $t(19) = 1.56$, $p = .14$. Therefore, the null hypothesis was held tenable and not rejected. Analysis of data when comparing the counterbalanced groups taught principles of carburetion of four-stroke cycle gasoline engines also revealed no significant ($p = .47$) differences between groups $t(19) = -.74$.

This research agrees with previous research (McGregor, 2002) indicating no significant differences seen between groups when incorporating animations in lessons dealing with theories and principles of small gas engine operation on the post secondary level. It should be further noted that treatment and control groups both increased in knowledge acquisition directly proportional from pretest to posttest measures indicating knowledge gained were not resulted to treatments $t(18) = .24$; $t(18) = -.16$. Because learners in today's classrooms are more technologically adept, enhancing classroom knowledge delivery via animations may not increase knowledge but it is assumed by the researchers that animations can hold interest which may not result in further knowledge acquisition. The findings of this study confirm previous research (McGregor, 2002) and should quell debate over its use in post-secondary institutions. Further study should investigate the perceptions held by students regarding interest. The researchers also recommend further research into how animation effects the retrieval of animation (Pavio, 1971) relating to students preference of learning. A final recommendation is to replicate this study in secondary settings to determine its relevance towards students with negligible previous experience in theories of small gas engine operation (Edgar, 2006).

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Research

Tips from the Trenches: Teaching Advice for Beginning Academics

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Tips from the Trenches: Teaching Advice for Beginning Academics

Introduction/Need for Research

While many professions require on-the-job training or orientation, academic life assumes new faculty members have the skills, knowledge, and ability for on-the-job success when they arrive (Lucas & Murry, 2007). However, the transition from graduate students to new faculty members can reveal issues about their new employment situations and roles as educational professionals (Bowen & Schuster, 1986). Pressure to obtain grants, to develop a research agenda, and to advise undergraduate and graduate students might discourage new faculty interest in teaching (Cooper, 1980). The National Research Agenda for Agricultural Education and Communications recognizes the need for enhancing the effectiveness of agricultural and life sciences faculty as a research priority area (Osborne, n.d.). Since achieving success as a faculty member can be a challenge, universities are developing interventions (e.g. sabbatical programs, development activities, workshops, orientations) that contribute to faculty success and retention. This research contributes to the scholarship of teaching and learning knowledge base and provides teaching advice that can assist both graduate students and new faculty members as they develop their academic careers.

Theoretical Framework

The study was theoretically framed around andragogy, which is concerned with helping adults learn (Cross, 1981). More specifically, Knowles (1978) provides five assumptions of adult learners that could apply to college faculty who work on developing their instructional skills: self-concept, experience, readiness to learn, time perspective, and orientation to learning. As individuals mature, their self-concept changes from dependency to self-directedness because they gain experience and their readiness to learn is more focused on developmental tasks for their social roles. Adult learners are motivated to learn in order to address problems.

Methodology

A qualitative research design was used for this study. Researchers purposively selected six tenured faculty members of a southwest university's Teaching Academy to participate in semi-structured face-to-face interviews. The six Teaching Academy members were recognized by their colleagues for demonstrating excellence in teaching. Each participant represented a different academic department at the university. The purpose of the study was to gather advice from these tenured faculty members that would benefit graduate students and new, or junior, faculty. The interviewer engaged participants with probing questions to explore emerging themes during interviews. The interviews were digitally recorded to ensure dependability (Guba & Lincoln, 1989). Recordings were transcribed and analyzed for emerging themes, similarities, and dissimilarities. Data were analyzed using Glaser's constant comparative method (1978) to analyze responses between participants. This method allows researchers to identify patterns or relationships within the data. Participants' responses were used to draw conclusions and recommendations.

Findings

Eleven best lessons emerged from the interviews with tenured Teaching Academy participants:

1. Seek out a mentor among the seasoned faculty in your department to learn as much as possible.
2. Determine who are among the best professors in your discipline and observe their classroom instruction.
3. Plan and rehearse lesson plans, so you are confident in your instructional approach.
4. Try multiple teaching strategies to learn what fits your style and personality the best.
5. Present information in multiple ways by using different learning modalities (audio, visual, kinesthetic) to help students understand the material.
6. Follow good instructional design (set objectives, determine teaching material, design classroom activity, and complete evaluation of learning outcomes).
7. Have students complete mid-term evaluations as a formative assessment of the professor's teaching.
8. Make student learning meaningful by connecting new information to an existing knowledge base.
9. Provide active learning opportunities in small and large lectures through in-class activities (e.g. think-pair-share, case studies, class discussion, clicker questions, simulations).
10. Develop rubrics as a tool for grading assignments.
11. Grade assignments or exams question by question to maintain consistency in point values.

Conclusions

Participants found value in working with a mentor and observing good professors within their disciplines to help them develop their teaching skills. Graduate students and new faculty were encouraged to try multiple teaching strategies to learn what instructional approaches fit their personality and style. Using multiple teaching strategies for reaching the different learning modalities can help students learn. One way to incorporate different teaching strategies is through the use of small group and class discussions, clickers, or case studies. Additionally, confidence in their ability to teach emerged as these participants spent time planning and rehearsing their lessons plans. Mid-term evaluations by students would further help professors or graduate students assess their teaching.

Implications/Recommendations

Graduate students and new faculty could be viewed as independent, adult learners who are motivated to apply new teaching strategies that benefit their roles as professors. The list of lessons learned from tenured faculty provide suggestions for graduate students and faculty as they search for ways to improve their teaching skills. Departments should provide opportunities for graduate students and new faculty to learn about, implement, and evaluate teaching strategies in their own classrooms. Studies could determine whether these suggestions would lead to greater competence, greater confidence, and less faculty turnover.

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Research

To Teach Or Not To Teach: What Factors Impact Preservice Students' Decision to Teach?

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To Teach Or Not To Teach: What Impacts New Teachers' Decision to Teach?

Faced with an ongoing shortage of secondary agricultural educators, states such as *Western State* continually struggle to find qualified teachers to fill available teaching positions (Kantrovich, 2007). Given our nation's current financial downturn, one might think the need for teachers would be met since budget cuts have decreased or eliminated funding for new hires in many school districts. With this reduction in hiring, it would seem there should be more newly qualified teachers than available positions. However in *Western State*, 65 agriculture teaching positions were available for fall 2009 and only 44 new agriculture teachers were credentialed. Of those 44 new teachers, nearly 30% did not find or did not pursue an agriculture teaching position. This finding is consistent with a national trend that reported an even higher percentage, with over 50% of newly qualified teachers not entering the agriculture teaching profession (Kantrovich, 2007). In 1995, Brown concluded there were ample numbers of agricultural education graduates, so the teacher supply problem resulted from insufficient recruitment of those qualified new teachers into the profession. Hillison, Camp, and Burke (1987) reported some graduates naturally decide to seek employment outside of teaching and the flexibility of the agricultural education major permits and prepares graduates to pursue a broad range of agriculture careers. With *Western State's* current fiscal struggles, agriculture industry jobs are difficult to acquire as opposed to the abundant opportunities in agricultural education. This phenomenon served as the impetus for an examination of factors that may contribute to new teachers' decisions to pursue a career in agricultural education.

The purpose of this study was to compare new teachers who secured employment to those who had not, specifically to determine if notable differences existed in self-perceived levels of agriculture teacher efficacy, intentions and aspirations to teach, teaching expectations, career barriers, and career support.

Methodology

This descriptive census study focused on all newly credentialed agriculture teachers in *Western State* over the 2008-09 academic year, which according to the *Western State* Department of Education consisted of 44 individuals (L. McCabe, personal communication, January 6, 2010). The target population was comprised of new teachers who attended the *Western State* Agricultural Teachers Association's annual conference and new teacher meeting. In June 2009, 86% (n = 37) of new teachers were in attendance. The 37 new teachers were asked to complete a questionnaire consisting of 115 items. This instrument was pilot tested on 396 agriculture teachers in 2007. Reliability was established through post-hoc analysis of Cronbach's Alpha. Coefficients of the construct scales ranged from .88 to .96. The instrument measured four constructs using 5-point Likert items. These constructs examined intentions and aspirations to teach agriculture, expectations about a career in agricultural education, perceived likelihood and difficulty overcoming career barriers, and perceived level of support from family, friends, and teachers. The other four constructs assessed overall agricultural teacher efficacy. These constructs used 9-point Likert items measuring self-efficacy levels related to classroom/lab instruction, FFA leadership/supervision, SAE supervision, and program management. Analyses of the eight construct scales used grand mean scores to compare the two groups, those that were teaching (n = 24) and those that were not (n = 13). Demographic data were analyzed using frequencies (Gall, Borg, & Gall, 1996). The state's agriculture teacher directory was used to determine which new teachers had found employment for fall 2009.

Results

Completed questionnaires were received from 37 of the 44 new teachers for a response rate of 86%. Of the 24 respondents who were teaching agriculture, their average age was 23, 75% (*n* = 18) were female, 80% (*n* = 19) were Caucasian, 91% (*n* = 21) had over a 3.0 g.p.a, and all 24 reported that they intended to pursue a career teaching agriculture. Of the 13 who were not teaching agriculture, their average age was 27, 54% (*n* = 7) were female, 77% (*n* = 7) were Caucasian, 92% (n = 12) had over a 3.0 g.p.a., and all but one respondent indicated that they intended to pursue a career teaching agriculture.

When the two groups of respondents were compared, findings showed those who were teaching reported notably higher mean efficacy scores related to their classroom/lab teaching (*M* = 118.0 vs. *M* = 109.2), FFA leadership/supervision (*M* = 101.2 vs. *M* = 95.3), and on the overall agriculture teacher efficacy scale (*M* = 324.8 vs. *M* = 309.0). However, when examining the two groups on the remaining efficacy constructs, the researchers found that no practical differences existed related to program management (*M* = 43.5 vs. *M* = 43.0) and SAE supervision (*M* = 62.0 vs. *M* = 61.5). The same is true of the remaining constructs of agriculture teaching expectations (*M* = 54.9 vs. *M* = 54.7), likelihood of career barriers (*M* = 24.8 vs. *M* = 25.0), difficulty of overcoming career barriers (*M* = 24.8 vs. *M* = 22.0), and level of support (*M* = 3.6 vs. *M* = 3.4). Given the possibility that several new teachers were limited by specific career barriers such as inability to relocate or due to personal relationships, the researchers also compared both groups on each of the individual career barriers. In doing so, no notable differences were found in any of the barriers examined.

Conclusions

This study sought to compare those new agriculture teachers who found employment to those who had not on various constructs. Based on the findings, it can be concluded that those new teachers who were employed reported having slightly higher overall agriculture teacher efficacy and in the specific areas of classroom/lab instruction and FFA leadership/supervision. Although it would not be appropriate to conclude their greater sense of efficacy contributed to success in acquiring a teaching job, it does stimulate interest in further examination of this phenomenon given the ongoing need to fill agriculture teaching positions. Is it more challenging for students with lower efficacy levels to find employment? What steps could be taken to help these students increase their efficacy related to classroom/lab instruction and FFA and what implications, if any, would it have on their ability to find or pursue a teaching position.

Recent studies (Kelsey, 2006) have examined the impact of career barriers, more specifically, those finding some new teachers were "place bound". This inability to relocate did in some cases prevent teachers from finding employment. This study found no such issue was prevalent. Consequently, additional research is needed to examine the differences in the efficacy levels of new teachers to determine if these differences have an impact on new teachers' decisions to enter the profession.

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Innovative Idea

Training the Teachers: An Agricultural Communications Career Development Event Training Workshop

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Training the Teachers: An Agricultural Communications Career Development Event Training Workshop

Introduction

When preparing for the FFA Agricultural Communications Career Development Event (CDE), many agri-science teachers find themselves overwhelmed. The contest involves Associated Press style, grammar, news editing, and five different practicum areas: broadcasting, graphic design, news writing, public relations writing, and Web design. Many teachers are not familiar with the topics; therefore, an educational program for the agricultural communications CDE for agri-science teachers was deemed necessary by the CDE's organizers.

The faculty at a southern university's department of agricultural education and communications administers this state's ag communications CDE each year. Officials noticed consistent errors from the students and common questions from the teachers. To help teachers feel more comfortable coaching the CDE team and to show them helpful resources, the faculty and the CDE superintendent deemed it necessary and appropriate to develop a workshop to be presented at the state agri-science teachers' annual conference.

Program Phases

The program was designed using Boone's Conceptual Programming Model (Boone, Safrit, & Jones, 2002). An initial examination of the target audience was conducted in early July 2009 and consisted of a survey of the agri-science teachers who consistently participated in the CDE (n = 23) to determine how to structure the workshop. The participants were asked to rate their comfort level of teaching each of the quizzes and practicum areas on a Likert-type scale of one (very uncomfortable) to four (very comfortable). The Web design practicum was the least comfortable area to teach while the broadcast practicum was the most comfortable.

When designing the 90-minute workshop, more time was dedicated to the Web design practicum. Each element of the contest received its own sub-section of the workshop and contained active learning techniques such as think-pair-share, question and answer, show and tell, and demonstrations. The teachers also received access to an ag communications CDE wiki that contained information for the contest and helpful handouts. The wiki also allows the teachers to share information that they find helpful with each other (Quittner, 2006).

Following the workshop, an evaluation was conducted and yielded a response of 21 participants out of 50 attendees. The evaluation was a one page, hard copy survey questionnaire. The questions on the evaluation instrument came directly from the initial needs assessment questionnaire.

Results to Date

The purpose for the evaluation was to see if the teachers gained a greater understanding of the rules and requirements of the ag communications CDE. The results from the needs assessment were compared to the results of the program evaluation to determine if comfort in coaching an ag communications CDE improved following the workshop.

Following the workshop, the data indicated the participants were most comfortable coaching the communications quiz, but they were still uncomfortable coaching the Web design practicum. However, when compared to the initial needs assessment questionnaire, the workshop brought improvement in confidence level of coaching all elements of the contest as indicated in Figure 1.

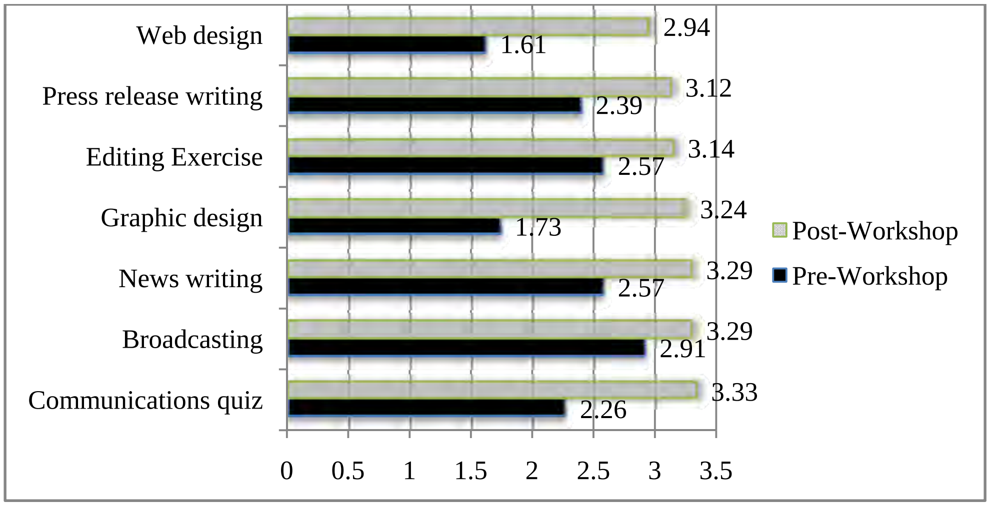

Figure 1. Mean Comfort Level by Topic

The broadcasting practicum saw the largest improvement in confidence with an 88% change, followed by the news writing practicum, which improved by 78%. Other positive changes were as follows: public relations practicum, 76%; communications quiz, 68%; Web design practicum, 54%; graphic design, 53%; and editing exercise, 27%. Based upon the pre-program needs assessment and post-program evaluation, the program did make a difference in the confidence of agri-science teachers who coach or plan to coach an ag communications CDE team.

Future Plans and Advice to Others

The CDE wiki is still available to teachers at http://ffaagcommunicationscde.wikispaces.com/ and is updated monthly to assist teachers. In addition to the wiki, the faculty will continue presenting ag communications CDE workshops each summer at the state agri-science teachers conference. The faculty will present this workshop to the department's student teachers each semester. Other departments that administer their state's ag communications CDE are encouraged to do a similar program. All information, including the lecture slides used during the workshop, is posted on the wiki and everyone is welcome to use it. Although it is early, the CDE's organizers have already noticed a decrease in questions from teachers about the contest.

Costs/Resources Needed

The costs for this workshop were faculty members' time and handouts. Resources needed to conduct a similar workshop include a laptop, projector, and handouts. Other resources may be added as faculty members see fit.

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Innovative Poster Proposal

Transforming Education in Agriculture for a Changing World

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Transforming Education in Agriculture for a Changing World

Introduction

Colleges of agriculture and related sciences are in the midst of a national movement that is designed to improve teaching and learning in the agricultural sciences, preparing graduates for future careers and additional study as they prepare to become part of the global society. Representatives from academics and industry have met to discuss various aspects of what needs to be done to effect change. Since much of the proposed changes center on curriculum and instruction in agriculture, and since agricultural teacher education is well-equipped to provide leadership, this poster addresses the needs and proposes ways in which agricultural education can partner with others in the agricultural sciences in curriculum and teaching endeavors. For the past several years, the Academic Programs Section of the Board on Agriculture Assembly of the Association of Public and Land-grant Universities (APLU) has been involved in a series of events to address the question, "What should programs in agricultural sciences in the public universities in the United States be like in the future in order to prepare graduates for the world of work in the twenty-first century?" That theme is evident throughout the various reports of the Kellogg Commission (1997). This poster will summarize findings from previous writing, meetings, discussions and workshops and review some forces of change and factors of resistance in terms of program changes, and then propose ways that agricultural teacher education can provide leadership in effecting change.

Program Phases To-Date

From various sources in the literature, most notably the work of Kunkel and others in 1996 and 2001, five forces of change that affect the curriculum have been identified. Those are resources, demographics, science, mission, and industry. A second area of influence is factors of resistance. These include mission, resources, philosophy and leadership. An examination each of these will lead to a better understanding of what external and internal forces might be considered to effect change in teaching and learning through curriculum reform. The Academic Summit held in 2006 addressed six important topics for consideration, namely how people learn, student learning, culture and curriculum, practical experience, articulation, and globalization. The various conferences and presentations culminated in a publication of The National Academies titled *Transforming Agricultural Education for a Changing World* (2009). Of the nine steps for achieving change, three should be of particular interest to agricultural teacher education. They are curriculum development, student development, and teaching enhancement.

Implications for Agricultural Teacher Education

Agricultural teacher education has an important role to play as colleges of agriculture and related sciences address these important issues. Agricultural teacher education must be *partners with* rather than *in service to* the various disciplinary units within the colleges. Just as plant pathologists and entomologists partner with horticulturalists in striving to solve the issues of the fruit industry, teacher education must identify its rightful place in enhancing teaching and the curriculum. The following are suggested ways for that to occur.

Future Plans and Opportunities for Agricultural Education

Curriculum development

A course is included in the curriculum generally for one of two reasons – it has always been taught, or someone identified a new topic and developed a course. Much less frequently, faculty first identify what it is that graduates need to know and be able to do and then design the curriculum that meets those needs. Teacher educators are experts in helping address the National Academies focus on curricular change.

Teaching enhancement

The one source of variance in student achievement that can be manipulated by the instructor is teacher behavior. The landmark work of Rosenshine and Furst (1971) provides evidence of selected teacher behaviors that are related to an improvement in student performance. Again, teacher educators are experts in this field and can conduct research and in-service education to address the needs.

Student development

Several agricultural teacher educator programs include instruction and other scholarly pursuits in the area of leadership education and leader development. Agricultural education programs should step to the forefront in conducting development activities, research and in-service education for students within the colleges to help prepare new leadership for the agricultural industry.

Resources Needed

The amount of resources needed could be negligible, depending on the expertise and availability of faculty. In the best-case scenario, the agricultural teacher education program could be subsidized by the college and/or other departments for providing leadership and programming in the focus areas enumerated by the national study.

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Innovative Idea

Transforming leaders through international experiential learning: A synergistic collaboration between nonprofit organizations and academia

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Transforming leaders through international experiential learning: A synergistic collaboration between nonprofit organizations and academia

Introduction

The increasing trend of globalization has amplified interest in international education. A survey conducted for the Association of American Colleges and Universities reports more than 60% of employers polled believed recent graduates lacked the skills to succeed in the global economy (Fischer, 2007). The Committee for Economic Development (2006) also makes the plea to enhance our current educational system through the strengthening of foreign language skills and international awareness of students. Industry is clearly sending higher education a message concerning the need for international education and rightly so, institutions need to address this issue. This program aims to move beyond a traditional educational approach engaging students in a synergistic collaboration allowing students to learn from leaders in the development and professional sectors of the industry. Through experiential learning, students expand their needs and expectations of learning to a higher level while increasing their confidence and motivation for careers in the global economy.

Program Framework

As a result of this interest in global education, a collaboration of organizations developed an educational experience and international program based upon experiential learning and leadership for college students. The International Collegiate Agricultural Leadership (ICAL) program has been a successful model providing the opportunity for collegiate students from various academic disciplines to gain a valuable life experience transforming their views of agricultural development, leadership, and cultural awareness.

As the concept for the program was developed, staff from both the National Grains Council and the National FFA Organization came together to determine the educational objectives for the program. The two-week intensive experience begins with cultural training and orientation where students are briefed on economic trends, trade issues and policies, and cultural components of the countries visited.

This program is validated and disseminated through the educational frameworks of Bloom's Taxonomy (1956) and Kolb's Experiential Learning Model (1984).

With Bloom's (1956) categories for the cognitive domain, the program objectives address:

- Knowledge: Identify information about the cultural, economic, and development of the respective countries through training and prepared resources.
- Comprehension: Understand complexities of the economies in respective countries through site visits to various sectors of the agricultural and food industry.
- Application: Apply knowledge and demonstrate learning by conducting a SWOT analysis of each country.
- Analysis: Identify current trade and cultural issues of each country; Discover careers in international development and marketing.
- Synthesis: Create a presentation explaining findings from SWOT analysis presented at end of visit to host country stakeholders.

- Evaluation: Describe experience and relate to educational interest through reflective journaling and presentations to local, state, and regional agricultural groups.

Kolb (1984) also provides a framework for the experiential learning component of this international program. The four stages of the experiential learning cycle are demonstrated through:

- Concrete Experience: Student actively participates in the experience through travel to a foreign country, visits to various industry sectors and cultural offerings.
- Reflective Observation: Student reflects through journaling and the development of a presentation summarizing his or her experience abroad.
- Abstract Conceptualization: Student conceptualizes through the SWOT analysis and presentations.
- Active Experimentation: Student applies new learnings to academic discipline and leadership situations.

Results to date

This powerful program takes students through a wide range of educational and cultural encounters resulting in a transforming experience. ICAL has been in place since 2006 traveling to the countries of China, Egypt, Morocco, Spain, and Vietnam. The management of this program relies upon the consultation of industry professionals and knowledge of emerging world markets for agriculture. As a result, the location and focus of the program from year to year is in line with recent trends, technology, and issues facing agriculture on a global scale. Consequently, students share their experience and transfer information and knowledge to others through education and their chosen careers.

Only the top 12 applicants are selected for the program each year. This allows the focus to be on tailored educational development and individual growth for each student. While a selective program, it has given 48 students the opportunity to engage in agricultural education on a global scale.

Future plans and resources needed

While onsite contacts in the countries and sponsor support are necessary, equally important are the partnerships fostered with academia across the nation. These connections aid in the recruitment of students for this selective program. Therefore, continual support is needed from professionals in academia by recognizing and encouraging students to take part in this program. By doing so, such discussions will foster global dialogue in the collegiate agricultural classroom.

An additional goal of this program is to engage past participants, sponsors, and the continual network of career and educational opportunities for students interested in global opportunities. Linking students with industry will further individual career goals while fostering further reflection and evaluation of the program. Many businesses and organizations will continue to depend on students' abilities to cooperate and interact with other cultures and communities around the world (Committee for Economic Development, 2006).

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Using Concept Maps to Better Understand the Discipline of Agricultural Education

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POSTER PRESENTATION:
Innovative Idea

Using Concept Maps to Better Understand the Discipline of Agricultural Education

Introduction

A keystone of any agricultural education degree program is a foundation of agricultural education course where the discipline, including its history, philosophical premises, and knowledge bases, is introduced. One of the challenges of teaching such a course is gauging student's understanding of the discipline at the start of the course and measuring the extent to which that understanding has evolved throughout the course. Concept mapping was introduced into the course as a means to effectively incorporate the transfer of learning and metacognition while allowing students to realize their advancement along the novice to expert continuum (National Research Council, 2000).

Concept maps provide a means of visually representing the cognitive structure and interconnectedness of a discipline (Martin, 1994; Novak, 1991). Among the many advantages, Weideman and Kritzinger (2003) suggested that concept maps are helpful to challenge students' ways of thinking, discover themes, explain conceptual relationships, and meet course outcomes. This constructivist approach to learning helps articulate an individual's understanding and structure of knowledge (Daley, 2002).

How It Works

As the instructor of this graduate level, online-based foundations of agricultural education course, I set the stage for the utilization of the core adult learning principles espoused by Knowles, Horton, and Swanson (2005), via a written statement in syllabus that was entitled "Philosophical Approach to the Course." The statement as written in the syllabus follows:

> As the instructor of this graduate level course, I will take a social constructivist approach where I will serve as the facilitator of learning and the students will be responsible for their learning. Although this is a historical and philosophical based course where we study the body of knowledge that proceeds us, the value of the course is in the ability of the learner to make meaning of this knowledge and use it as a context for understanding current policy, developing and understanding one's own and others' philosophical stance, and understanding agricultural education's role in society. The result of this approach and the course is the continued development of the student towards becoming an educated person who understands the foundation of his/her discipline, his/her role within the profession, and the means by which his/her research focus fits within agricultural education. This approach will also allow students to tailor the course to meet their individual educational needs as learners.

The initial assignment was a Preliminary Concept Paper and Map of Agricultural Education. This assignment consists of 1) an introductory concept paper, which provided a definition of agricultural education and its role in society, and 2) a preliminary concept map that visually depicted agricultural education. The final exam for the course was a philosophical essay and concept map of agricultural education. This assignment asked students to develop a comprehensive personal philosophy of agricultural education. They were expected to use what was learned in class to justify their personal philosophical approach to agricultural education and design a comprehensive concept map which articulates the breadth and complexity of agricultural education.

When the assignments were given, students were provided an assignment sheet and a recording explaining the assignment, which were both posted within the WebCt course environment. The assignment sheet explained the expectations of the assignment, offered guiding questions, provided details for assignment submission, and outlined the evaluation criteria for the assignment.

Results/Implications

This approach positively impacted student learning. Often times students' initial concept map focused on one or two settings, usually those in which they are involved, and not the broader context of agricultural education espoused by Williams (1991) or the National Research Agenda (Osborne, 2007). However, by the end of the course, students were more reflective and were better able to articulate a broader understanding of the agricultural education discipline. As a result of this project, students were able to articulate the linkages and interrelationships of the discipline in a meaningful and personalized manner.

Students were required to internalize their understanding of the agricultural education discipline and then articulate that understanding using higher order skills like critical thinking, problem solving, and reasoning through metacognition. Students were able to build upon their existing knowledge within a context that was familiar to them and in a manner in which they were able to transfer their understanding of the discipline to future course work and real world experiences.

Future Plans/Advice to others

Concept mapping is an effective way for students to better grasp their understanding of a complex and abstract entity like the discipline of agricultural education. This is only one example of how concept mapping might be effectively utilized within agricultural education. Agricultural educators are encouraged to consider utilizing this teaching strategy at the undergraduate and graduate levels where appropriate. This strategy would also be appropriate for use in secondary agricultural education programs and should be shared with preservice teachers.

Those who plan to utilize concept mapping in their courses should be cognizant of the required teaching approach and the technological issues associated with the assignment. A constructivist approach in which the educator facilitates learning and allows students to create their own meaning and understanding is essential. This approach requires learning for understanding, using pre-existing knowledge, and active learning as suggested by the National Research Council (2000). An issue, however, is that students can become consumed by the technological constraints (e.g., availability of appropriate software, technical skills required to develop the map, ability to imbed and/or upload such documents into WebCt). Educators should encourage students to focus on the content of the map and not spend the majority of their time dealing with technological issues. Sharing examples of ways in which to develop and submit the concept maps seemed to alleviate undue stress and improve the content of the maps. Concept maps were submitted using commercial software, freeware, Microsoft Word, PowerPoint, and even photographs of maps that were sketched on poster board.

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Innovative Idea

Using Interactive Whiteboards in the Agricultural Education Classroom: How Student Teachers are Using this Technology—Potential Implications for Teacher Educators

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Using Interactive Whiteboards in the Agricultural Education Classroom: How Student Teachers are Using this Technology—Potential Implications for Teacher Educators

Introduction and Background

"Interactive whiteboards (IWBs) are becoming increasingly popular in educational environments" (Haldane, 2007, p. 257). IWBs are large, touch sensitive screens linked to a classroom computer, which allow teachers to access still and moving images with sound and provide a multi-modal portal to address the needs of whole classes, groups, and individual learners (Lewin, Somekh, & Steadman, 2008). IWBs promote pupil interest, more sustained concentration, and more effective learning when teachers know how to use the technology to support a variety of learning styles (Glover & Miller, 2001a, b, c, 2002, 2003 as cited in Glover, Miller, Averis, & Door, 2007). Thus, educators need to design lessons that connect students and the instructor to provide opportunities for learning through multi-media (Nelson & Thompson, 2005). Because teachers often teach as they were taught (Nelson & Thompson), it is imperative that use of IWBs in teaching methods courses for pre-service AGED students is facilitated. Kotrlik, Redmann, and Douglas (2003) stated, "Even though numerous studies have been conducted about how agriscience teachers use technology, no research has been conducted to determine how these teachers are integrating technology in the teaching/learning process" (p. 82). Although most agriscience teachers actively explore and adopt technology for regular use in instruction, there is limited active experimentation and advanced integration of technology in instruction (Kotrlik et al.). Because little research has been done describing how U.S. teachers are using IWBs generally, or in the AGED classroom specifically, more should be understood about AGED teachers' use of IWBs, including pre-service AGED teachers.

How It Works

In their teaching methods course, pre-service teachers were introduced to the concept of IWBs, specifically, SMART™ technologies (i.e., SMART Technologies, 2009). The introduction of this technology was to encourage their using it in lesson preparation and in the high school AGED classroom during student teaching. An IWB distributor provided a comprehensive demonstration to the students, which included general usage, applications, hardware, and related software (i.e., SMART™ Notebook SE bracelets). Thereafter, student teachers created lessons incorporating their use of these technologies. Opportunities were then provided to student teachers to present lessons and receive feedback about their lesson presentations, including use of the IWB to enhance instruction. Following the four-week, on-campus courses, student teachers entered their 12-week student teaching experience with SMART™ Notebook SE bracelets. The bracelets allow mobility for instructors and students alike to access the Notebook SE software from any computer to construct and deliver lessons. Student teachers are required to complete weekly reports to document their use of the IWBs, including use of the software bracelets. Data from their reports are being collected to assess how they are using IWBs.

Results to Date

Nine of the 11 student teachers have access to an IWB, and seven of the nine are using the technology. From data collected, student teachers reported using IWBs to teach lessons on Animal Science, Plant Science, Agricultural Power & Technology, Introduction to Agriscience, 8th Grade Agricultural Explorations, Natural Resources, and Horticulture. Additionally, the student teachers reported using the IWB to deliver content using PowerPoint®, playing games such as Jeopardy and baseball to review lesson content, and interactively identifying livestock anatomy and breeds of livestock. Student teachers are also journaling, i.e., writing narrative comments, about their experiences with the IWBs.

Future Plans and Cost/Resources Needed

AGED faculty will continue to collect data for the remainder of the fall 2009 student teaching semester, and discuss student teachers' use of the IWB when conducting observations at the student teaching centers. At conclusion of student teaching, the students will participate in a focus group interview during their capstone seminar debriefing. During the interview, their use of IWBs, in lesson preparation and teaching, will be probed more deeply to better inform faculty about future preparation needs to ensure effective use of IWBs, and what may be opportunities for more systematic inquiry. It is also anticipated that cooperating teachers' use of IWBs will be studied in the future, including the impact of student teachers on cooperators' adoption and use of this innovative instructional tool.

Item	Cost Range	Average Cost
Interactive Whiteboard	\$1,200 - \$3,000	\$2,100
LCD Projector	\$750 - \$3,000	\$1,875
PC or MAC Computer	\$750 - \$4,000	\$2,375
Software (i.e., SMART™ SE Notebook Bracelets)	\$49 - \$55	\$52
TOTAL	**\$2,749 - \$10,055**	**\$6,402**

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Research Poster

Using Mathematics Enrichment Activities in Preparation for the Agricultural Mechanics CDE

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Using Mathematics Enrichment Activities in Preparation for the Agricultural Mechanics CDE

Introduction/Need for Research

Agricultural education programs provide a model for the integration of mathematics, science and engineering concepts in a real-world context. An emphasis on contextualized curriculum has been shown to improve various aspects of student learning by enhancing the connection between subject matter content and real life (National Research Council, 1996). Secondary agricultural mechanics instruction is designed to develop an understanding of the applications of mathematics, reinforce mathematics through situated learning, and provide instruction in employability and entrepreneurial skills through such a context (Shinn, 1998). Johnson (1991) previously demonstrated the efficacy of linking agricultural mechanics instruction to real-world mathematics contexts.

Conceptual/Theoretical Framework

The theoretical framework for this study is grounded by the seminal works of John Dewey, Jean Lave, and Etienne Wenger. Dewey (1916) posited that instruction is most effective when integrated into a workplace setting. Dewey viewed a dual-track system as undemocratic, educationally limiting, and not meeting the needs of society.

Lave and Wenger (1991) forwarded the significance of situated learning, or 'learning by doing;' a concept that has great significance for agricultural education. Effective instruction is situated in a setting that has meaning to the learner. How we learn and how we apply what we learn is as important as what we learn (Lave & Wenger).

Career development events provide a competitive opportunity for the application of principles of science, technology and mathematics (STEM) to everyday situations. Curriculum leaders emphasize the importance of incorporating real-world applications in teaching secondary mathematics and science (National Council for Teachers of Mathematics, 1989). The State Agricultural Mechanics CDE is a contextual learning situation anchored in an authentic workplace scenario.

The purpose of this study was to investigate the effect of enrichment activities in contextual settings on the performance of selected groups of students. The objective was to compare CDE Contest outcomes; the Written Examination, Team Individual Skill scores, and Team Activity scores between teams exposed to mathematics enrichment activities and those that were not.

Methodology

The study employed a causal-comparative quasi-experimental design (Gall, Gall & Borg, 2003). Subjects were selectively exposed to a treatment, but were neither randomly selected nor randomly assigned to the treatment group. Data sources used to provide information for this study included; results from subjects' participation in the State Agricultural Mechanics CDE; Scores information for the three separate data components. These Written Exam Scores, Individual Skill Scores, and Team Activity Scores were obtained from Judgingcard.com.

The target audience was composed of students enrolled in power, structural and technical systems courses in secondary schools in Texas. The competitive selection process for the Agricultural Mechanics CDE was used to select the sample, preventing the random assignment of subjects to treatment groups. Schools competing in the 2007 State CDE were given the opportunity to participate in the enrichment activity sessions. Students who received enrichment activities in contextual mathematics served as the experimental treatment group. Students in 16 schools not provided enrichment activities served as the control group. Twenty-nine schools and 109 students competed in the 2008 Agricultural Mechanics CDE. Thirteen schools who participated in enrichment sessions qualified to compete in the 2008 State Agricultural Mechanics CDE.

Institutional Review Board requirements were met. During the treatment sessions, participants and teachers were given student and parental permission release forms, and asked to bring the signed forms to the State Agricultural Mechanics CDE. Completed forms were collected during the examination component of the CDE.

Results/Findings

The findings suggest that enrichment activities do improve individual and team performance on the Agricultural Mechanics Career Development Event. The difference in Written Examination scores between cooperators and non-cooperators by team was 36.96 (12.32 X 3). The difference in the average Total CDE Score between cooperators and non-cooperators by Team was found to be 52.25. The Written Examination score accounted for 71% (36.96 / 52.25) of the variability in Total CDE score by Team. Cooperation status had a large effect on 2008 Written Examination Score. Cooperating teams scored 12.32 points higher than non-cooperating teams; a score increase generally adequate to change the outcome of most career development events.

Cooperation status had a large effect on 2008 Team Total CDE Score. The mean total numeric score of cooperating teams was 420.38, 52 points above the mean of non-cooperating teams. The mathematics enrichment improved the total numeric scores of cooperating teams by an average of 52.25 points per team, or 17 points per individual. Cooperation status had a large effect on 2008 Team CDE Rank. Participating in the contextual mathematics enrichment improved their team rankings by an average of 8 places.

Implications/Recommendations/Impact on Profession

This study should be replicated in other states, at a national level, and in various other career development events that include contextual mathematics competencies. Contextual problems appropriate for multiple disciplines can be developed and tested. Involving other CTSOs could prove beneficial (Zirkle & Connors, 2003).

Consideration should be given to replication of this study with a greater focus on diversity. A related study found that contextual mathematics problems incorporated into AFNR classroom instruction did increase student achievement for some ethnic groups (Jasek, 2005). Efforts should be made to identify states where greater ethnic and gender diversity is represented in the participants of the agricultural mechanics CDE.

Consideration should be given to increasing the availability of contextual mathematics in-service workshops for agricultural science teachers.

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Utilizing Virtual Field Trips in Preservice Teacher Education

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Innovative Ideas Poster
Utilizing Virtual Field Trips in Preservice Teacher Education

Introduction

Teacher preparation programs frequently employ clinical experiences and school visits as methods of effectively preparing preservice teachers. Interviews of both college students and inservice teachers have found “clinical experiences to be the most strongly approved portions of teacher education programs” (Zeichner, 1980). Additionally, some of the reform directing the future of agricultural education teacher preparation relates to the time devoted to field-based experiences (Connors, 2001). For these reasons, many teacher preparation programs require early field experiences throughout their preservice teachers’ academic programs (Zeichner, 1980). In Connors and Mundt’s study performed in 2001, the majority of agriculture teacher preparation programs were reported to require some form of early field experience before student teaching. Because middle and high school agriculture programs differ greatly by school, the benefits of multiple field experiences for preservice teachers are numerous. However, barriers including preparation and planning time (Lacina, 2004), funding, scheduling conflicts, and distance limit the number of agriculture program visits teacher educators can offer their students. A possible method to allow more observation of various agriculture programs while overcoming these barriers lies in virtual field trips, which provide access to places normally considered difficult or impossible for classrooms to visit (Lacina, 2004). Through the creation and utilization of virtual field trips in teacher preparation programs, preservice teachers can gain access to various schools and agriculture departments in their teacher education classes, while teacher educators save time and resources.

Steps

This innovative idea is currently being implemented in a southern state’s land grant institution’s agricultural education Early Experience Block, which contains 24 preservice teachers in their junior year of college. Each preservice teacher is required to create a virtual field trip of the school/agriculture department in which they are currently completing thirty field experience hours. They were provided step-by-step instructions to create a virtual field trip using mapwing.com, a free virtual field trip creation site. Through this site, preservice teachers create maps of schools and agriculture departments, display multi-direction views from various points, showcase specific areas of interest, and guide visitors through the tour as if they were actually walking in the building. Each photograph is accompanied by comments that serve as the tour guide’s explanation of what the tourist is viewing.

Once all virtual tours are completed, preservice teachers direct their classmates through their field experience schools using the virtual field trip in a presentation. Student opinions regarding the creation of a virtual field trip and perceptions of the efficacy of using these field trips as a method of gaining access to multiple agriculture departments has been assessed. This assessment, along with the views of agriculture education professionals gathered through the presentation of this Innovative Ideas poster, serves to gauge the efficacy of the use of virtual field trips in this setting, as well as provide ideas for improvement for future years.

Results and Implications to Date

Initial observation of student reaction to the assignment was encouraging. Preservice teachers expressed great interest in both creating virtual tours and taking on the role of "tourist" for their classmates' tours. Further, they had few initial questions regarding methods for creating the virtual tours. The implications for the utilization of virtual field trips to enhance student understanding of various agriculture departments are vast. The agricultural education programs that students experience increase greatly in number, and can become more diverse due to the elimination of geographical and time barriers. Preservice teachers gain a larger appreciation for different aspects of all types of agriculture departments in both middle and high schools, perhaps even across state lines. These students can then utilize their education and these virtual field trips to gather a greater variety of tools and ideas to later utilize in their own classrooms. Students also gain a deeper understanding of the various components of their own field experience site by creating the virtual tour for others.

Advice to Others

Agricultural education professors at universities nationwide are encouraged to utilize virtual tours, through either a similar assignment or alternative methods, to allow increased opportunities for their preservice teachers. These opportunities will eliminate geographical, resource, and time barriers so students can observe a greater variety of middle and high school agriculture departments, as well as experience more FFA events and SAE visits. In order to maximize the benefits of virtual field trips in the classroom, it is recommended that teachers take several virtual field trips prior to planning an assignment involving them, so they are familiar with the navigation and process of virtual tour design (Lacina, 2004). Through discussion and collaboration with others who are interested in further developing the use of virtual tours in the teacher preparation program, the benefits and methods of this innovative idea can gain greater clarification and merit.

Resources Needed

There are several free websites that allow users to create virtual tours; the one utilized in this project is www.mapwing.com. In order to create the virtual field trip, individuals must have a digital camera or camera phone capable of downloading photographs onto a computer, and access to the internet. The most costly aspect of this project is the trip required to obtain photographs of the field trip site. However, the cost incurred by one person's travel to a school is nominal compared to that of an entire pre-service teacher class. Further, this cost can be eliminated through collaboration with individuals closer to sites of interest.

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Virtual Student Teacher Meeting:
Implementing “Face-to-Face” Reflection at a Distance

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Innovative Idea Poster Proposal

Virtual Student Teacher Meeting:
Implementing “Face-to-Face” Reflection at a Distance

Introduction

Student teaching is a critical time in the pre-service development of future agricultural education teachers. Student teaching is critical to the development of teachers (Alger & Kopcha, 2009; Kasperbauer & Roberts, 2007). Supervision of student teachers is critical to their future success and the involvement by the university supervisor is important (Stephens & Waters, 2009). Electronic dialogue can assist in developing critical reflections as well as providing ongoing support throughout the student teaching experience (Whipp, 2003). In a study reviewing student teacher concerns, Fritz and Miller posit, “[c]ommunicating through an Internet-based communication tool might also provide timely feedback to the student teacher” (2003). Since cooperating teachers are located in various agricultural education departments across this Midwestern state. “…[T]oo often university faculty are challenged with great distances that separate them from the teacher candidates…” (Burrack, 2008, p. 2).

The purpose of this innovative idea poster is to share how an Agricultural Education department at a Midwestern university utilized an internet-based supervisory tool to enhance the supervision of student teachers. During the 2009-2010 academic year, fall and spring semester student teachers from a Midwestern university participated in virtual “face-to-face” student teacher/supervisor meetings to reflect on their experiences and ask questions of other student teachers as well as their university supervisors.

The technology used to facilitate these meetings was Wimba, a virtual classroom environment that includes audio, video, application sharing and the capabilities to archive content in MP3 and MP4 formats. It is integrated through web course tools (WebCT) now owned by Blackboard. WebCT is an environment that provides an online course management system for the development of Web, Web-enhanced, and Web-assisted courses (CELT, 2009, p. 2)

Procedures

- The teacher education coordinator designed a WebCT course and enrolled the Fall semester 2009 student teachers.
- A Wimba classroom was embedded within the WebCT course and tested with Information Technology support staff prior to the student teacher meeting.
- An agenda was uploaded to the Wimba classroom and the student teachers were sent an email message with directions on how to access it.
- The student teachers logged into the Wimba classroom and retrieved the agenda to prepare for the one-hour virtual “face-to-to face” meeting.
- Questions for which the student teachers were asked to prepare included the following:
    1. What has been your biggest surprise in transitioning from the college environment (as a student) to the student teaching environment (as a teacher)?
    2. What has been your greatest challenge thus far in your student teaching experience? How did you handle it?
    3. Share a success story from your student teaching experience of which you are most proud?

4. List three “A-ha” moments that you have had. In other words, be ready to discuss three things that were introduced to you in your teacher certification training program that didn’t really make sense until you experienced them as a student teacher.
5. If you could give advice to the Spring semester 2010 student teachers, what would you tell them?

- A pilot virtual student teacher meeting was held with two student teachers at two locations—each located over 175 miles from university. The Midwestern university attendees included the teacher education coordinator, university supervisors and the teacher education faculty.
- A formal discussion was held utilizing the previously disseminated questions as a guide.
- The two student teachers provided the teacher education coordinator with a written reflection regarding the quality of the meeting and the effectiveness of the technology.
- The meeting was archived in an MP4 format for ease of access and used to review the main points of discussion.

Results

Students who participated in the virtual “face-to-face” to reflection sessions felt that the experience met several needs: 1) it validated their worth during the student teaching experience; 2) it allowed them the opportunity to share challenges as well as successes; and 3) it gave them confidence in their preparation as a future teacher.

Selected student comments were as follows:

“I thoroughly enjoyed our meeting on Wednesday. To be honest I was not looking forward to it because of the busy time schedule. After we did our meeting I was very happy we did and I got a lot out of our time together. It was fun to hear about [the other student’s] experiences as well.”

“I think the meeting was a good thing because it showed that we were valued even though we weren’t on campus. It showed that the department still cared about our education this semester too, which is GREAT! I learned from the meeting that we are really lucky to have some many people caring about our teaching futures. I felt that this meeting made me more confident to share the same feelings about discipline and preparation for becoming a teacher.”

Future Plans

Student teachers will participate in a Wimba training session prior to student teaching and will be used for two student teaching meetings during the fourteen week session in addition to two traditional face-to-face meetings on campus. We will set up virtual breakout rooms for the students to meet and discuss student teaching issues on a bi-weekly basis. Wimba will also be used for one virtual supervision session during the student teaching experience.

Resources Needed

WebCt and Wimba are provided by the Midwestern University to all departments for use at this time. Faculty members will need to purchase a web camera and microphone to participate in meeting from his/her desktop. The cost will approach $50 per person.

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