Proceedings

2005 American Association for Agricultural Education Southern Region Conference

Hosted by
School of Human Resource Education and Workforce Development
College of Agriculture
Louisiana State University

February 5-8, 2005 – Little Rock, Arkansas
The Peabody Little Rock Hotel

2005 AMERICAN ASSOCIATION FOR AGRICULTURAL EDUCATION SOUTHERN REGION CONFERENCE

2005 HOST: LOUISIANA STATE UNIVERSITY

February 5-9, 2005
The Peabody Hotel - Little Rock, Arkansas

AAAE Southern Region Conference Officers
President: Joe W. Kotrlik, Louisiana State University
Vice-President: Randol Waters, University of Tennessee
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American Association for Agricultural Education (AAAE) Southern Region Officers
Vice-President: James Smith, Texas Tech University
Alternate Vice-President: Adam Kantrovich, Morehead State University
Secretary: Randol Waters, University of Tennessee

SATURDAY, FEBRUARY 5

4 - 7 p.m.	**Registration** - Louisiana State University	Lobby, Peabody Hotel

SUNDAY, FEBRUARY 6

8:00 a.m.	**Registration** - Louisiana State University	Prefunction Area Peabody Hotel
9:00 a.m.	**Joint Agricultural Education and Agricultural Communications Vespers Service** Don Herring, University of Arkansas Ricky Telg, University of Florida Kim Dooley, Texas A&M University	White Oak Room
10:00 a.m.	**Opening Session** Presiding: Joe Kotrlik, Louisiana State University Remarks: James Smith, Southern Region Vice-President, AAAE Adam Kantrovich, Southern Region Alternate Vice-President, AAAE (Outstanding Paper Selection) Facilitators: Gary Wingenbach, Texas A&M University Rick Rudd, University of Florida Robin Peiter, University of Kentucky	White Oak Room

10:30 a.m.   Concurrent Research Session I

Session A: Technology and Distance Education   White Oak Room

Chair: Jay Morgan, Murray State University
Discussant: David Lawver, Texas Tech University
Facilitators: Chanda Elbert, Texas A&M University

Roadmap to Measuring Distance Education Instructional Design Competencies - *Kim E. Dooley, James R. Lindner, Texas A&M University; Ricky W. Telg, Traci Irani, University of Florida; Lori Moore, University of Idaho; Lisa Lundy, Louisiana State University; Rebekah Raulerson, The Market Place*

China Agricultural University Faculty Adoption Behavior about Web-Based Distance Education - *Yan Li, James R. Lindner, Gary J. Wingenbach & Timothy H. Murphy, Texas A&M University*

An Analysis of Technology Use and Quality Of Life in a Rural West Texas Community - *Susie J. R. Bullock, Texas A&M University & Texas Tech University; James H. Smith, Texas Tech University; Gary Briers, Texas A&M University*

Relationships between Student Achievement and Levels of Technology Integration by Texas AgriScience Teachers – *Jason B. Peake, The University of Georgia-Tifton Campus; Gary Briers & Tim Murphy, Texas A&M University*

Session B: Professional Development   Lafayette Room

Chair: Cliff Ricketts, Middle Tennessee State University
Discussant: Jim Flowers, North Carolina State University
Facilitator: Travis Park, University of Florida

Extension Agents' Perceptions of Fundamental Job Characteristics and Their Level of Job Satisfaction - *Meagan Scott, Kirk A. Swortzel & Walter N. Taylor, Mississippi State University*

Teacher Preparation and In-Service Needs Associated With Management of the Total Program of Agricultural Education in Georgia - *John C. Ricketts, John Uesseler, Jason B. Peake, The University of Georgia-Tifton Campus; Dennis W. Duncan, The University of Georgia*

A Comparison of Teacher Efficacy of Traditionally and Alternatively Certified Agriculture Teachers - *Steven J. Rocca & Shannon G. Washburn, University of Florida*

The Relationships between Selected Demographic Factors and the Level of Job Satisfaction of Extension Agents - *Meagan Scott, Kirk A. Swortzel & Walter N. Taylor, Mississippi State University*

Session C: Youth Organizations   Ouachita Room

Chair: Robin Peiter, University of Kentucky
Discussant: Tony Brannon, Murray State University
Facilitator: Rusty Miller, Virginia Tech

Volunteer Administration Leadership Proficiency and Leadership Styles: Perceptions of Southern Region 4-H County Faculty - *Nicole L. P. Stedman, Texas A&M University; Rick D. Rudd, University of Florida*

National FFA Career Development Events: An Introspective Inquiry - *Barry Croom & Gary E. Moore, North Carolina State University; Jim Armbruster, National FFA Center*

Development of Youth Leadership Life Skills of Texas Youth as San Antonio Livestock Exposition School Tour Guides – *Laura A. Real & Julie Harlin, Texas A&M University*

Student Demographics, Extracurricular Participation and Safety Education of Students Participating in The 2003 Houston Livestock Show and Rodeo Agricultural Mechanics Project Show - *Doug Ullrich, Dwayne Pavelock, Joe Muller & Billy Harrell, Sam Houston State University*

12:00 p.m. **Lunch on your own**

1:15 p.m. **AAAE Regional Committee Meetings**

Professional Development Committee — White Oak Room
Chair: Barry Croom, North Carolina State University (5/05)
Members: Kirk A. Swortzel, Mississippi State University (5/06)
Shannon G. Washburn (5/06)
Carrie A. Fritz (5/07)
John C. Ricketts (5/07)

Program Improvement Committee — Conway Room
Chair: Tom Dobbins, Clemson University (5/05)
Members: Jim Leising, Oklahoma State University (5/06)
Robin Peiter (5/06)
Dennis W. Duncan (5/07)
Chandra Elbert (5/07)

Research Committee — Ouachita Room
Chair: James E. Dyer, University of Florida (5/05)
Members: Craig Edwards, Oklahoma State University (5/06)
Todd Brashears (5/07)
Barry Boyd (5/07)

Communications Committee — Lafayette Room
Chair: Gary J. Wingenbach, Texas A&M University (last year's chair) (5/05)
Members: Adam Kantrovich (5/06)
Dwayne Cartmell (5/06)
Jerry Gibson (5/07)
Kim E. Dooley (5/07)
Tracy A. Rutherford (5/07)

Resolutions Committee — Marion Room
Chair: Mark Kistler, University of Florida
Dwayne Pavelock, Sam Houston State University
Antoine Alston, North Carolina A&T State University

2:45 p.m. **Poster Session and Break** — Prefunction Area
Chair: Tom Dobbins, Clemson University — Peabody Hotel

Identifying Educational Opportunities for Youth Participating in the 4-H or FFA Swine Project: A Survey of Packers - *Lisa Koteras, Jodi Sterle & Chris Boleman, Texas A&M University*

Fuel Efficiency of Small Gas Engines: Unleaded Gasoline versus Ethanol 85 (E-85) - *Keith Warnock, Aaron Dickinson, George Wardlow & Donald Johnson, University of Arkansas*

Agri-Science for Teachers: A New Methods Course for the Agri-Science Laboratory - *John C. Ricketts, Dennis Duncan & Jason Peake, The University of Georgia*

Discover Your Own Path: Assessing the Effectiveness of Virginia Tech's College of Agriculture and Life Sciences Recruitment Brochure - *Jennifer Surotchak, Michelle Khilji, Letitia Wu, Josh Lewin, & Hank West, Virginia Tech*

4:00 p.m. **SAAS General Session** Conway Room/Peabody Hotel

6:30 – 8:30 p.m. **SAAS Reception** Peabody Ballroom Salon C

MONDAY, FEBRUARY 7

7:30 a.m. **Registration–Louisiana State University** Prefunction Area, Peabody Hotel

8:30 a.m. **Concurrent Research Session II**

8:30a.m. Concurrent Session II

Session D: Student Teaching Ouachita Room

Chair: Marcus Comer, North Carolina A&T State University
Discussant: Gary Moore, North Carolina State University
Facilitator: Dwayne Pavelock, Sam Houston State University; Penny Haase-Wittler, Southern Arkansas University.

The Process of Supervision with Student Teacher Choice: A Qualitative Study - *Carrie A. Fritz & Michelle Stumbo, University of Tennessee*

A Profile of Cooperating Teachers and Centers in Oklahoma: Implications for the Student Teaching Experience in Agricultural Education – *R. Brent Young & M. Craig Edwards, Oklahoma State University*

Career Decisions of Pre-service Agricultural Education Teachers: A Synthesis of Research - *Steven J. Rocca & Shannon G. Washburn, University of Florida*

Challenges Expressed By Cooperating Teachers When Working With Students Teachers in Agricultural Education: A Delphi Study - *Carrie A. Fritz & Lori Jean Mantooth, University of Tennessee*

Session E: Extension Programs and Personnel Lafayette Room

Chair: Adam Kantrovich, Morehead State University
Discussant: Randol Waters, University of Tennessee
Facilitator: Elizabeth B. Wilson, North Carolina State University

Correlational and Predictive Attributes of Demographic Factors and Their Relationship to Hispanic Participation in Texas Extension Programs - *Ruben J. Saldaña, Texas Cooperative Extension Service; David Lawver, Texas Tech University; James Lindner & Scott Cummings, Texas A&M University; Hansel Burley & Marvin Cepica, Texas Tech University*

Factors Contributing to Volunteer Administration Leadership Proficiency of Southern Region 4-H County Faculty - *Nicole L. P. Stedman, Texas A&M University; Rick D. Rudd, University of Florida*

Future Job Openings in the Field of Agricultural Education and Communication - *David Jones & Rick D. Rudd, University of Florida*

Characteristics of Creative County Extension Programs in Texas: Comparison of Administrative Perceptions to Observations in Identified Creative Programs - *Michael Womack, Texas Cooperative Extension Service; Matt Baker, Texas Tech University; Kim E. Dooley, Texas A&M University*

Session F: Leadership and Youth Development Harris Brake Room
Chair: Dennis W. Duncan, University of Georgia
Discussant: James Leising, Oklahoma State University
Facilitator: Jeffrey Horne, Southern Arkansas University

Challenges Of Service-Learning in a Southern State's 4-H Youth Development Program: A Delphi Study - *Lori Jean Mantooth & Carrie A. Fritz, University of Tennessee*

The Impact of Socioeconomic Status on Leadership Potential in an Agricultural Leadership Program - *Leah J. Wall, Timothy J. Pettibone & Kathleen D. Kelsey, Oklahoma State University*

Selected Texas Agricultural Organization Board Members' Perceptions of Communication Methods and the 2002 Farm Bill - *Christa L. Catchings, Gary J. Wingenbach & Tracy A. Rutherford, Texas A&M University*

Benefits Of Service-Learning in a Southern State's 4-H Youth Development Program: A Delphi Study - *Lori Jean Mantooth & Carrie A. Fritz, University of Tennessee*

10:00 a.m. Break

10:30 a.m. Concurrent Research Session III

Session G: Instructional Methods Ouachita Room
Chair: Carrie A. Fritz, University of Tennessee
Discussant: Jacque Deeds, Mississippi State University
Facilitator: Jason B. Peake, The University of Georgia-Tifton Campus; Penny Haase-Wittler, Southern Arkansas University

Reading Strategies and Textbook Use in Agricultural Education - *Travis Park & Edward W. Osborne, University of Florida*

Using CD-Based Materials to Teach Turfgrass Management: An Assessment of the "Turf for Texans" Master Gardener Curriculum - *Chyrel A. Mayfield & Gary J. Wingenbach, Texas A&M University; David R. Chalmers, Texas Cooperative Extension Service*

Effects of Investigative Laboratory Instruction on Content Knowledge and Science Process Skill Achievement across Learning Styles - *Brian E. Myers & James E. Dyer, University of Florida*

Effects Of Lecture Versus Experiential Teaching Method On Cognitive Achievement, Retention, And Attitude Among High School Agriscience Students - *Linda Ann Newsome, George W. Wardlow & Donald M. Johnson, University of Arkansas*

Session H: Learning Styles and Learning Lafayette Room
Chair: Nicole Stedman, Texas A&M University
Discussant: Gary Briers, Texas A&M University
Facilitator: Holly Kasperbauer, Texas A&M University

The Influence of Learning Style, Leadership Style, and Leadership Adaptability on Critical Thinking Disposition - *Kimberly A. Bellah & James E. Dyer, University of Florida*

The Effects Of Multimedia Cues On Student Cognition In An Electronically Delivered High School Unit Of Instruction - *Todd Brashears, Cindy Akers & James Smith, Texas Tech University*

The Influence of Student Learning Experience Level and Learning Style on Achievement – *T. Grady Roberts, Texas A&M University*

A Comparison Of Commonwealth Accountability Standardized Test Scores Between High School Agricultural Education/Career And Technical Education Students And The Kentucky State Standards – Catherine Woglom, *Brian Parr, & Jay A. Morgan, Murray State University*

Session I: Mentoring Harris Brake Room
Chair: Jay Morgan, Murray State University
Discussant: David Coffey, Western Kentucky University
Facilitator: Diana Mowen, Texas A&M University; Jeffrey Horne, Southern Arkansas University

College Of Agriculture Faculty Perspectives in Their Role as Advisor and Mentor - *Robin L. Peiter & Beth Dukes, University of Kentucky*

Factors Related to the Effectiveness of Progress toward Degree Regulations - Elizab*eth B. Wilson & Barbara M. Kirby, North Carolina State University*

Coverage and Outcomes of the Space Agriculture in the Classroom Program - *Glenn D. Israel, Jennifer M. Richardson, Edward W. Osborne, Shannon G. Washburn & James E. Dyer, University of Florida*

Student Advising and Mentoring in a College Of Agriculture: Examining Faculty and Administration Attitudes - *Robin L. Peiter & Beth Dukes, University of Kentucky*

12:00 p.m. **Conference Luncheon** Peabody Ballroom Salon C
Presiding: Adam Kantrovich, Southern Region AAAE Alternative Vice-President
Moment of Silence
Memorial Recognitions
Graduate Student Recognitions
Speaker: Distinguished Mystery Lecturer

1:30 p.m. **AAAE-SRC Business Meeting** Ouachita Room
Presiding: James Smith, Texas Tech University, Southern Region AAAE Vice-President
AAAE-SRC Vice President: Randol Waters, University of Tennessee
AAAE-SRC Secretary: Thomas R. Dobbins, Clemson University

2:00-3:30p.m. **SAAS Board of Directors Meeting** Miller Room
(Kotrlik/Waters/Dobbins) Statehouse Convention Ctr

2:45 p.m. **Break**

3:15 –
4:45 p.m. **Professional Development Seminars** Peabody Ballroom Salon B

Chair: Barry Croom, North Carolina State University
Chair, AAAE Southern Region Professional Development Committee

Facilitators: Kirk A. Swortzel, Mississippi State University; Shannon G. Washburn; Carrie A. Fritz , University of Tennessee; John C. Ricketts, The University of Georgia

- Innovative Professional Development for Teachers
- Undergraduate and Graduate Distance Education
- Agricultural Literacy
- Agricultural Leadership Programs
- Teaching the Integration of Academics and Career and Technical Education
- Teaching Teachers How to Cope With Misbehavior
- International Education

5:30 p.m. **Awards Reception** Peabody Ballroom Salon C

TUESDAY, FEBRUARY 8

7:00 a.m. **SAAS Board of Directors Meeting** Fulton Room
Statehouse Convention Ctr

8:30 a.m. **Professional Development Seminars** Peabody Ballroom Salon B

Chair: Barry Croom, North Carolina State University
Chair, AAAE Southern Region Professional Development Committee

Facilitators: Kirk A. Swortzel, Mississippi State University; Shannon G. Washburn; Carrie A. Fritz , University of Tennessee; John C. Ricketts, The University of Georgia

- Alternative Certification for Teachers
- Teacher Induction
- Innovative Teaching Ideas
- How to Prepare Articles for Acceptance in a Journal
- Research Agendas and Ideas

10:00 a.m. **Adjournment**

ROADMAP TO MEASURING DISTANCE EDUCATION INSTRUCTIONAL DESIGN COMPETENCIES

Kim E. Dooley & **James R. Lindner**, *Texas A&M University*
Ricky W. Telg & **Tracy Irani**, *University of Florida*
Lori Moore, *University of Idaho*
Lisa Lundy, *Louisiana State University*
Rebekah Raulerson, *The Market Place*

Abstract

This study was designed to measure instructional design competencies as a result of participation in a nine-month Web-based training program called Roadmap to Effective Distance Education Instructional Design. The researchers used a self-assessment pre- and post-test to determine participant initial and final competence in 12 areas: Adult Learning, Understanding Teaching at a Distance, Instructional Design, Course Development, Delivery Strategies for Teaching at a Distance, Instructional Technology Resources, Advanced Interaction Methods, Accessibility, Planning and Conducting Evaluation, Evaluation Analysis and Reporting, Administrative Issues, and Training and Support. Open-ended verification narratives were analyzed using the constant comparative method. This competency model worked well to document learning as a result of participation in the program.

Introduction

A recent study by Raulerson, Telg, Moore, and Dooley (2003) highlighted the need to develop and disseminate a "train-the-trainer" model for instructional designers. Institutions of higher learning are facing the challenge of offering support for technology-based faculty training and development efforts (Campus Computing Survey, 1999). Institutional support to assist a faculty member's development, such as teaching incentives, instructional design support, and technology training, has been shown to be necessary in creating successful distance education training and development programs (Berge, 2001), so that instructors will have the new knowledge and skills that researchers indicate are necessary to teach effectively by distance education (Beaudoin, 1990; Brigham, 1992; Dillon, Hengst, & Zoller, 1991; Shaeffer & Farr, 1993; Willis, 1993; Wolcott, 1993). Spotts (1999) indicated that if instructors are expected to use instructional technologies – including distance education technologies – they need technical support and training. Therefore, the instructional designers and technology specialists, who provide distance education support and training for faculty, need to be knowledgeable about not only the latest technology, but also the educational methods to use that technology (Irani & Telg, 2001; Telg, 1995).

However, many instructional designers who come from a technology-development background (video producers, computer program developers) do not have theoretical knowledge in instructional design methods, as it relates to distance education (Telg, 1995). A study of 14 land-grant universities (Irani & Telg, 2001) found that two-thirds (64.3%) of instructional designers who actively worked with faculty to develop distance education courses had had no prior training or knowledge of instructional design methods used in distance education before working at their universities. Twelve of the 14 respondents said they had learned distance education instructional design methods while "on the job." Telg (1995), in a study of video production specialists who support their universities' distance education efforts, found that the video production specialists also had learned distance education instructional methods while on the job.

Telg (1996a) recommended that a training curriculum be developed to teach television-production-specialist-turned-instructional-designers the information and skills – particularly knowledge of instructional design – that they needed to perform their jobs, so they can subsequently support faculty members' efforts. Particular areas of instructional design that video producers needed more knowledge in included the following: audience identification and needs, adult education theory, adapting content to the technology, distance education theory, interaction methods in distance education, and evaluation techniques in distance education (Telg, 1996b). Because technology changes so rapidly, instructional designers must be provided means to learn about how to apply these informational technologies in learning environments and about learning theories in distance education. Instructional designers must be adequately prepared in order to assist faculty, so that faculty can effectively teach undergraduate and graduate distance courses.

In response to this need, six universities – the University of Florida, Texas A&M University, Texas Tech University, the University of Idaho, the University of Missouri-St. Louis, and Iowa State University – collaborated on a project titled *Roadmap to Effective Distance Education Instructional Design*. This project was funded by a U.S. Department of Agriculture Higher Education Challenge Grant to develop effective materials and innovative approaches to better prepare instructional designers at land-grant universities and other universities with agricultural academic programs to support their universities' distance education teaching programs. This "train-the-trainer" approach provided distance education instructional designers – who may be learning instructional design theory and practice on the job – with skills and knowledge to more effectively help faculty members develop distance education courses.

The faculty involved in this project wanted to determine if knowledge and skills were acquired by these professionals as a result of the *Roadmap* training program. Previous studies on the use of self-assessment tools to document growth or learning had been conducted with graduate students through a semester-long course (Dooley & Lindner, 2002) and international professionals during a week-long training program (Dooley, et al., 2004), so this framework served as the guidepost for the design for this study.

Review of Literature

Competencies are operationally defined as the required knowledge, skills, and abilities need to be successful in given endeavor. Competencies needed by agricultural education professionals have been studied by various researchers (Dooley & Lindner, 2002; Dyer & Osborne, 1996; Garton, Spain, Lamberson, & Spiers, 1999; Goecker, 1992; McCormick & Whittington, 2000; Place & Jacob, 2001).

Competency models can be used as an assessment tool, a career development tool, and as a behavioral requirement benchmarking tool (Dooley, et al., 2004; Dooley & Lindner, 2002;

Yeung, Woolcock, & Sullivan, 1996). Kirkpatrick (1994) measures the value of distance learning on four levels: participant reaction, skills acquired, skills implemented and organizational benefits accrued. Kirkpatrick suggests ways to measure value at each of these levels, including surveys, achievement tests, observation, monitoring employee productivity and efficiency, and traditional business measures for return on investment (ROI). Measuring competencies provides a mechanism for measuring these levels concurrently, from the perspective of the participant.

According to Canning (1990), competence must be demonstrated and measured in the context of a work-related situation. Professionals have used competency models to "clarify organization-specific competencies to improve human performance and unify individual capabilities with organizational core competencies" (Rothwell & Lindhom, 1999, p. 104). Organizations provide training so that individuals will become more competent and, therefore, more effective in their jobs. It is often assumed that training provides the condition for effective learning; however, "from the individual's perspective, training cannot be assumed to produce learning, nor that learning is always an integral part of training" (Antonacopoulou, 1999, p. 17).

Transfer of learning and the ability to measure learning outcomes as a result of a training program have become major issues in training and development (Antonacopoulou, 1999; Kellie, 1999; Smith, 1999). "Currently, the individual's perspective is relatively under-researched, thus much remains unclear about the way individuals perceive the association between training and learning and more significantly whether individuals actually learn from training" (Antonacopoulou, 1999, p.14). Self-assessment instruments provide evidence of learned competencies (Dooley, et al., 2004; Dooley & Lindner, 2002). This study uses similar, yet, redesigned self-assessment instruments to determine learning and retention for distance education instructional design competencies after participating in a 9-month training program.

Purpose

The purpose of this study was to determine training participant's growth (learning) in distance education instructional design competencies as a result of a nine-month Web-based training program.

Context for the Study: *Roadmap* Course Description

The *Roadmap* training program included six "destinations" or modules. A one-week orientation session was conducted before the program to expose participants to the types of technology used in the destinations. Content was delivered on a monthly basis beginning in September and ending in April. A two-month break of December and January was provided because of the holiday season and because most participants were involved in distance education course development during that timeframe.

Each destination featured different synchronous or asynchronous delivery methods to provide participants with various examples of how to deliver educational materials at a distance. Destinations featured streaming video files, narrated PowerPoint presentations, chats, or threaded discussion boards, in addition to the asynchronous content. In addition, Web-based training materials – PDF files, video clips, and related materials – were provided to the participants to use in the training of their own faculty members.

At the conclusion of each destination, participants were asked to complete a *microproject*; a short assignment designed to show that the participants understood and could apply the content that was presented. The microprojects varied, based on the content and competencies of the destination. They had three weeks to complete the content and the microproject. During the fourth week, the destination coordinators evaluated the microprojects and returned their comments to participants.

Methods

This study is grounded in the qualitative research paradigm and replicates methods used previously by the authors. The general characteristics of this qualitative study reflect those identified by Fraenkel and Wallen (1999) as professionally acceptable and appropriate methods for studying a phenomenon when the natural setting is the direct source of data; data are collected holistically from a participant's perspective; data are analyzed inductively; and data attempts to capture concern for a participant's behavior, attitude, reason, or motive.

As with any study, it is important for the researcher to establish internal validity, external validity, reliability, and objectivity. However, in the qualitative paradigm these terms are referred to as credibility, transferability, dependability, and confirmability. Credibility and dependability were established by collecting the participants' responses directly into a database for analysis and verification. The description of the data provided sufficient detail and/or richness so that interpretations of the data could be transferred to other settings. Confirmability was established by coding the data and moving it to an Excel spreadsheet so that it was easily accessible for an audit trail.

The natural setting and prolonged engagement for the study was a nine-month "train–the-trainer" program delivered through WebCT. During the week-long orientation session, participants were asked to complete a self-assessment instrument to measure perceptions of competence in 12 core distance education instructional design competencies, modified from previous research (Dooley & Lindner, 2002). The core competencies, along with characteristics of each competency, are identified in Table 1. Participants were also asked to complete the self-assessment at the conclusion of the training program. Thirty-five participants completed both the pre- and post-assessment.

The self-assessment instrument was created based upon the core competencies and characteristics. This instrument was intended to serve as a reflection tool for the participants to measure their growth (learning) in the core competencies areas. The instrument uses a stair-step approach, rather than a continuum or Likert scale, to visually represent progression from novice (0) to expert (7). The numbers were intended to measure perceived growth rather than any statistical significance. Averages were calculated to show trends in the data only. Participants were asked to verify their answers with a brief narrative (Figure 1). Responses were coded to ensure confidentiality. The constant comparative method was used for data analysis on the verification narrative (Lincoln & Guba, 1985).

Table 1.
Core Competencies and Characteristics

Core competency	Characteristics of competency
Destination 1: Adult Learning & Teaching at a Distance	Learning theory Learning styles Methods for teaching adults Motivation Characteristics of distance learners Differences between distance and traditional environments Overview of effective distance teaching practices
Destination 2: Instructional Design & Course Development	Needs assessment Writing objectives Choosing content and methods Choosing delivery strategies Assessment Roles of a development team Best practices
Destination 3: Delivery Strategies for Teaching at a Distance & Instructional Technology Resources	Web delivery/learning management systems Equipment/hardware (including video, CD-ROM/DVD) Communication tools Software (including course management systems, graphics) Expertise Technical support Funding
Destination 4: Advanced Interaction Methods & Accessibility	Threaded discussions/chats as tools for communication Interactive teaching strategies Types of disabilities Legislation Considerations and options for designers
Destination 5: Planning and Conducting Evaluation & Evaluation Analysis and Reporting	Purposes Formative and summative evaluation Evaluation methods (surveys, focus groups, rubrics) Challenges of collecting data online Analyzing data Reporting results
Destination 6: Administrative Issues & Training and Support	Principles of best practices Marketing Copyright Training of faculty and students Student support services

▼ Adult Learning (Destination 1) ▼

Learning Theory
Learning Styles
Methods for Teaching Adults
Motivation
Characteristics of Distance Learners

Expert ▶ ◀ **7**

◀ **6**

◀ **5**

◀ **4**

◀ **3**

◀ **2**

◀ **1** ◀ *Novice*

Verification Narrative...

▼ Understanding Teaching at a Distance (Destination 1) ▼

Differences between distance and traditional environments
Overview of effective distance teaching practices (interaction, creating community, support structures, etc.)

Expert ▶ ◀ **7**

◀ **6**

◀ **5**

◀ **4**

◀ **3**

◀ **2**

◀ **1** ◀ *Novice*

Verification Narrative...

Figure 1. Example of Destination 1 Core Competency on Self-Assessment

Results

The results of this study were reported in two areas: the average growth in core competencies and the open-ended verification of growth categories. In Destination 1, the average growth for *Adult Learning* changed from 3.43 to 5.20 and for *Understanding Teaching at a Distance* the change was 3.43 to 5.39 (See Table 2). One participant, whose self-described knowledge on this topic was a 3 before the training and a 6 afterward, stated:

> I understand that adults have very different expectations and needs in learning environments. Adults expect information that is timely and relates to their situations. I understand that people learn in different ways. For example, some are more visual. I also realize that students have their own reasons for participating and learning in a course. It is important to keep these in mind when designing a course. Finally, I believe that distance learners tend to be for students who need a more flexible environment for courses than the traditional classroom (3).

For Destination 2, participants showed growth in *Instructional Design* by increasing in competence from a 3.50 to a 4.98. The *Course Development* competency had greater growth with a change from 3.00 to 5.07. A participant, who showed growth from a 4 at the beginning to a 6 at the project's completion, had this to say:

> The importance of the needs/objectives is paramount to instructional design. They are the reason for the course's existence and must be the starting point for effective design. Many questions regarding delivery methods, strategies, and assessment will be answered by consulting the objectives and considering the audience (33).

Table 2.
Average Growth in Competency Clusters

Core-Competency	**Overall Average**	
	Before	*After*
Adult Learning	3.43	5.20
Understanding Teaching at a Distance	3.43	5.39
Instructional Design	3.50	4.98
Course Development	3.00	5.07
Delivery Strategies for Teaching at a Distance	3.82	5.41
Instructional Technology Resources	3.93	5.17
Advanced Interaction Methods	3.07	5.34
Accessibility	2.75	4.68
Planning and Conducting Evaluation	2.93	5.12
Evaluation Analysis and Reporting	3.25	4.76
Administrative Issues	2.79	4.85
Training and Support	4.07	5.17

For Destination 3, participants changed from 3.82 to 5.41 in *Delivery Strategies for Teaching at a Distance* and 3.93 to 5.17 in *Instructional Technology_Resources*. A respondent, who changed from a 3 to a 6, wrote that by the end of the program the respondent could:

> ...recognize the diversity of delivery strategies that are available and the pluses and minuses associated with each method. I understand the need for adequate technical support to effectively implement and maintain equipment and to use development software (17).

In Destination 4, participants had the most average growth from 3.07 to 5.34 in *Advanced Interaction Methods*. Individuals had the lowest initial score (2.75) in the area of *Accessibility*, but did improve to a 4.68 by the conclusion of the program. A participant who was a 2 at the beginning stated "This is my weakest area thus far. I admit this is an area I have not adequately considered or applied" (15). By the end the same respondent claimed, "I did not know the tools or sites to use to evaluate accessibility. I thoroughly enjoyed this component and shared the sites with the Web folks in my College and University."

Planning and Conducting Evaluation showed the second highest growth with averages ranging from a 2.93 at the beginning to a 5.12 by the end. *Evaluation Analysis and Reporting* had a competence recorded initially at a 3.25 and final competence at 4.76 with only a 1.51 change in reported competence. An intriguing verification of a respondent who was a 3 at the beginning of the program, but by the end measured as a 6, felt initially that "our (institution's) current evaluation data is not analyzed in a critical way" (27). By the end of the program this respondent felt "This section gave insight into the use of survey tools, interviews, questionnaires, and focus groups…Methods for assessing and evaluating course assignments, the use of rubrics, peer review, and faculty assessment" (27).

For Destination 6, participants rated their competence at a 2.79 at the beginning and a 4.85 at the end for *Administrative Issues*. In the area of *Training and Support*, respondents were already fairly high in competence at a 4.07 and showed the smallest growth to 5.17 with a change of only 1.10 incrementally. A participant, measuring a 2 initially and a 5 at the conclusion, provided this comment:

> The host of new and unique methods of content delivery surely required a closer look at marketing and copyright issues and an increase in the value of developing and following 'best practices.' The workload of instructional designers must be balanced by proactive approaches to training and supporting the new 'user-friendly' technologies. Student and faculty orientation to technologies can ensure consistent and proper use and allow the focus to remain on the course content…where it should be (33).

Conclusions and Implications

There was a need for this type of project to address the issue of providing adequate support for people developing distance education courses (Raulerson, Telg, Moore, & Dooley, 2003). Participation in this project promoted the competence of instructional designers for assisting faculty in developing and delivering distance education courses. Based on this collaborative effort of six universities that have distance education programs, *Roadmap to Effective Distance Education Instructional Design* may result in improving the instructional design of programs and courses offered. The *Roadmap* project may also serve as a model for other universities and institutions. At the end of the project, most participants commented they had an increase in competency levels through their participation in the program, which was the overall goal of *Roadmap.* The respondents perceived their competence to improve with an average change of 1.77 or close to 2 incremental steps.

Study results from the *Roadmap* project were based on participants' self-assessment of their competency levels in instructional design prior to and following completion of the six destinations/modules. This approach of using competency-based assessment – already used in other content areas such as agricultural education (Place & Jacob, 2001; McCormick & Whittington, 2000; Dyer & Osborne, 1996; Goecker, 1992) – should be integrated more in the distance education field, as professionals trained in technical areas (video production, Web design, print design) become responsible for instructional design development. Competency-based assessment – the method used in this study – provides these and similar professionals with an understanding of what they know or can do prior to training and what they learned during the training session. Researchers in this study recommend that competency-based measures be integrated, via distance education technologies, in the training of professionals in various content areas.

There is a continued need to develop and refine assessment instruments to evaluate and authenticate learning. The findings of this study may also contribute to the growing body of literature related to identifying and assessing competencies. This model has been used in both a 15-week semester with graduate students and with international professionals in a one-week format with similar results (Dooley, et al., 2004; Dooley & Lindner, 2002). The researchers were concerned that because of the duration of this project, the retention and transfer of knowledge, skills, and abilities would diminish. That was not the case with this study.

Content has to be applicable and engaging to the target audience, and should be focused on the learner's environment. This was the plan for *Roadmap*. The content had to be focused on the professional's workplace needs. Participants had to demonstrate with the microprojects that they could apply what they learned, so they had to put their learning into practice. The collaborators on this project have plans to conduct a six-month follow-up to determine competency retention and transfer of skills/knowledge gained as a result of this project. We would recommend a similar approach for those developing competency-based measures for professionals in other areas, especially for those designing instructional/learning environments.

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CHINA AGRICULTURAL UNIVERSITY FACULTY ADOPTION BEHAVIOR ABOUT WEB-BASED DISTANCE EDUCATION

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Abstract

The purpose of this study was to determine China Agricultural University (CAU) faculty adoption behavior about Web-based distance education (WBDE). Rogers' (2003) model of five stages in the innovation-decision process was adopted as the theoretical base for the study. The model was modified by adding a new stage named "no knowledge" at the beginning of the process. Quantitative research was employed and the research design for the study was descriptive in nature. Results of data analysis found that about 70% of participating CAU faculty (N = 273) stayed in early stages in the innovation-decision process related to WBDE (no knowledge, knowledge, or persuasion) and about 30% were in later stages (decision, implementation, and confirmation). Faculty members' stage in the innovation-decision process differed significantly by their professional area, level of education, teaching experience, and distance education experience. Gender, age, and academic rank had no significant influence on faculty members' stage in the process.

Introduction

As a leading agricultural university in China, China Agricultural University (CAU) adopted Web-based distance education (WBDE) programs in 2001. Up to 2003, about 70 faculty members were involved in the WBDE programs and nine majors have been put online. More than 50 local distance education stations have been established and over 13, 000 students were attending the WBDE program at the CAU. As potential adopters of WBDE, do CAU faculty feel there is a need to adopt WBDE programs to reach more students outside campus, in other words, do they feel limited access to higher education by students is a problem in China? If yes, would WBDE be a good solution to the problem? What are their adoption behaviors about the WBDE program? The study was proposed to answer these questions.

Theoretical Framework

Rogers' (2003) pointed out that an individual's adoption behavior about an innovation is not an instantaneous act, but a process that occurs over time, consisting of a series of actions and decisions (Rogers, 2003). The innovation-decision process can be influenced by prior conditions (previous practices, felt needs/ problems, innovativeness, and norms of the social systems), perceived attributes of the innovation (relative advantage, compatibility, complexity, trialability, and observability), characteristics of the decision-making unit (socioeconomic characteristics, personality variables, and communication), and communication channels. Rogers (2003) put forward an innovation-decision process model. According to the model, there are five stages in an innovation-decision process:

1. Knowledge, which occurs when an individual (or other decision-making unit) is exposed to an innovation's existence and gains some understanding of how it functions;
2. Persuasion, which occurs when an individual (or some other decision-making unit) forms a favorable or unfavorable attitude toward the innovation;
3. Decision, which occurs when an individual (or some other decision-making unit) engages in activities that lead to a choice to adopt or reject the innovation;
4. Implementation, which occurs when an individual (or some other decision-making unit) puts an innovation into use; and,
5. Confirmation, which occurs when an individual (or some other decision-making unit) seeks reinforcement of an innovation-decision already made, or reverses a previous decision to adopt or reject the innovation if exposed to conflicting messages about the innovation. (p. 169)

Rogers' (2003) model of five stages in the innovation-decision process was modified in this study by adding a new stage named "no knowledge" at the beginning of the process. Thus, in the modified innovation-decision process, there are six stages along adopters' innovation-decision process: no knowledge, knowledge, persuasion, decision, implementation, and confirmation.

According to Rogers' (2003) adopter categories theory, innovation adopters may be categorized into five groups: (1) innovators who are the first 2.5% of the individuals in a system to adopt an innovation; (2) early adopters who are the next 13.5% to adopt the innovation; (3) early majority who are the next 34% of the adopters; (4) late majority who are the next 34% to adopt the innovation; and (5) laggards, who are the last 16% to adopt the innovation (p. 280-281). Different categories of adopters have different characteristics according to their socioeconomic status and personalities:

1. Earlier adopters are not different from later adopters in age;
2. Earlier adopters have more years of formal education than later adopters;
3. Earlier adopters have higher social status than later adopters;
4. Earlier adopters have larger units (farms, schools, companies, etc.) than later adopters;
5. Earlier adopters have greater knowledge of innovations than later adopters. (p. 288-291)

Other studies found potential adopters' personal characteristics influenced their perceptions and their adoption about WBDE. Miller and Miller (2000) studied appropriateness of a telecommunication network in Iowa to deliver different agricultural curricula and found that curricula with highest rate of appropriateness were agricultural economics and agricultural marketing, followed by job getting and keeping skill, agricultural sales and service, leadership, entrepreneurship, animal science, natural resources, food science, agricultural production, plant and crop science, biotechnology, horticulture, and agricultural mechanics. Miller and Miller (2000) concluded that curriculum areas that had laboratory, shop, or other hands-on activities were rated as not appropriate for telecommunication network delivery.

Schifter (2000) found that faculty members' gender, age, academic rank, and tenure status had no significant effect on the level of faculty participation in distance education programs. Born and Miller (1999) found there was no correlation between faculty members' academic rank and their perceptions of WBDE; however, distance education experience influenced significantly faculty members' perceptions about WBDE. Perceptions of WBDE were significantly higher for faculty with distance education experience.

Purpose and Objectives

The purpose of this study was to investigate China Agricultural University faculty members' perceptions about barriers to diffusion of WBDE. The specific objectives were to:

1. Determine faculty members' perceptions about problems related to limited access to Chinese higher education.
2. Describe faculty by their current stage in the innovation-decision process related to WBDE (no knowledge, knowledge, persuasion, decision, implementation, and confirmation).
3. Examine the relationship between faculty members' selected personal characteristics and their current stage in the innovation-decision process related to WBDE.

Methods

The research presented in this paper is part of a larger study being conducted to determine faculty members' perceptions about attributes and barriers impacting diffusion of WBDE at the CAU (Li, 2004). The target population for this study was faculty members at the CAU (N = 1170). Among the 1170 faculty, about 70 faculty members were participating in WBDE programs and 1100 faculty currently were not involved in WBDE programs. Random and stratified sampling was used for the study (Gall, Gall, & Borg, 2003). The sample number was derived by using the table of "Determining Sample Size for Research Activities" (Krejcie & Morgan, 1970). Fifty faculty members who were involved and 250 faculty who were not involved in WBDE programs were randomly drawn from across the CAU. Approval to conduct this study was granted through the Texas A&M University Institutional Review Board (#2004-0445).

The research instrument consisted of a three-part questionnaire. The first part was to determine faculty perceptions about problems related to limited access to Chinese higher education. Participants were asked to indicate their attitudes toward the statement "Limited access to higher education by students is a big problem for Chinese institutions of higher education" by choosing "I agree," "I disagree," or "I am not sure." The second part was to determine participants' stages in the innovation-decision process related to WBDE. Rogers' (2003) model of five stages in the innovation-decision process was adopted and modified as a theoretical base for this part. Besides the five stages (knowledge, persuasion, decision, implementation, and confirmation) mentioned in the model, another stage named "no knowledge" was added as the first stage in the innovation-decision process. Six statements were used to describe each stage. The participants were asked to select one statement that best reflected their current stage in the process. The third part of the instrument was designed to gather data on participants' personal characteristics. Selected personal characteristics included professional area, gender, age, level of education, academic rank, teaching experience, and distance education experience.

Content and face validity of the instrument was established by a panel of experts consisting of faculty members (at both American and Chinese institutions of higher education) who have expertise in adoption/diffusion research.

Data were collected by personal contact. In early December 2003, the questionnaire and cover letter introducing the research project, was delivered to 50 randomly selected faculty members with WBDE experience and 250 faculty members without WBDE experience at the CAU. Participants were asked to fill out the questionnaire in their spare time and the researcher picked up the questionnaires after it was finished. Participants were assured their responses were confidential and only group data would be reported. Questionnaires were coded for convenient analysis. Non-respondents were reminded after several days of non-response. Data collection ceased in early January 2004. A total response rate of 96.3% (n = 289) was obtained. Of the surveys returned, 16 were incomplete, resulting in a usable response rate of 91% (n = 273).

The collected data were analyzed using the Statistical Package for Social Sciences (SPSS, 11.0). Descriptive statistics were used to describe each variable. Alpha for all statistical procedures was set *a priori* at 0.05. Frequencies and percentages were used to summarize agreement levels with each of the statements related to perceived attributes of WBDE. Non-response error was controlled by comparing early versus late responses on faculty members' perceptions about attributes of WBDE. No significant difference was found, which means the results of the study could be generalized to the target population (Lindner, Murphy, & Briers, 2001).

To assess the magnitude of statistical differences, effect sizes were calculated, interpreted, and reported (Cohen, 1988). Interpretations for t-tests were based on the Cohen Conversion: negligible size = $d < 0.20$; small effect size = $0.50 > d \geq 0.20$; medium effect size = $0.80 > d \geq 0.50$; and large effect size = $d \geq 0.80$. Interpretations for ANOVA were based on the Cohen Conversion: negligible size = $f < 0.10$; small effect size = $0.25 > f \geq 0.10$; medium effect size = $0.40 > f \geq 0.25$; and large effect size = $f \geq 0.40$.

Findings

Participants (N = 273) from 12 different colleges were selected randomly to participate in the study. Among them, 179 (66%) were male and 94 (34%) were female. Their average age was 38 (range = 23-66). More than half of the participants (57.4%) had a doctoral degree, 26% had a master's degree, and 16.6% had a bachelor's degree. About half of respondents (50.5%) were associate professors, 26.4% were professors, and 23.1% were teaching faculty with other titles. Respondents averaged 11 years of teaching experience (range = 1-40). More than one quarter of the respondents (28.7%) indicated they had distance education experience in at least one of the three distance education programs: WBDE program, TV and broadcasting education program, or correspondence education program.

Objective one was to determine faculty members' perceptions about problems related to limited access to Chinese higher education. Their perceptions were described by faculty members' attitudes toward "limited access to higher education by students is a big problem for Chinese institutions of higher education." As Table 1 shows, among the participating CAU faculty (N = 273), 195 (71.9%) agreed with the statement; 48 (17.8%) disagreed with the statement, 28 (10.4%) indicated they were not sure; and three participants chose not to respond to the question.

Table 1
Distribution of Participating CAU Faculty Members by Their Attitude toward the Statement "Limited access to higher education by students is a big problem for Chinese institutions of higher education" (N = 273)

Attitude	*f*	%
I agree.	194	71.9
I disagree.	48	17.8
I am not sure.	28	10.4
Total	270	100

Note. Scale: 1 = I agree, 2 = I disagree, 3 = I am not sure; M = 1.39, SD = 0.67; three participants chose not to respond to this question.

Objective two was to describe faculty members by their current stage in the innovation-decision process related to WBDE (no knowledge, knowledge, persuasion, decision, implementation, and confirmation) (Table 2) Six stages were used to describe the innovation-decision process: no knowledge, knowledge, persuasion, decision, implementation, and confirmation. Among the 273 participants, 14.2% had "no knowledge" about WBDE. More than half of the population was in the stages of either "knowledge" (30.2%) or "persuasion" (26.5%). The rest of the population was in the stages of "decision" (14.6%), "implementation" (6.3%) or "confirmation" (8.2%). Six participants chose not to respond to this question. Figure 1 describes the distribution of the population in the six stages of the innovation-decision process related to WBDE (no knowledge, knowledge, persuasion, decision, implementation, and confirmation).

Objective three was to examine the relationship between faculty members' selected personal characteristics and their current stages in the innovation-decision process related to WBDE. According to professional area, faculty were categorized into 12 groups (Humanities and Social science, Economics and Management, Agronomy and Biotechnology, Resource and Environment, Basic Science and Technology, Animal Science and Technology, Biological Science, Food Science and Nutrition Engineering, Electronic and Electric Engineering, Veterinary Medicine, Engineering, and Water Conservancy and Civil Engineering). As Table 3 shows, faculty members' stages in the innovation-decision process differed significantly by professional area, F (11, 255) = 2.63, $p < 0.05$. A medium effect size (f = 0.34) was found.

Overall, CAU faculty (M = 2.93, SD = 1.42) tended to be in the "persuasion" stage. Faculty from the College of Humanities and Social Science (M = 3.88, SD = 1.54) tended to be in the "decision" stage, while faculty from the College of Electronic and Electric Engineering (M = 3.47, SD = 1.59), College of Food Science and Nutrition Engineering (M = 3.09, SD = 1.31), College of Engineering (M = 3.06, SD = 1.69), College of Economics and Management (M = 3.00, SD = 1.63), College of Veterinary Medicine (M = 3.00, SD = 1.36), College of Agronomy and Biotechnology (M = 3.00, SD = 1.44), College of Animal Science and Technology (M = 2.88, SD = 1.29), College of Basic Science and Technology (M = 2.70, SD = 1.08), and College

Table 2
Distribution of Participating CAU Faculty Members by Their Current Stage in the Innovation-Decision Process (N = 273)

Stage	Descriptions	*f*	%
No knowledge	I have not used Web-based distance education programs and have no plans for doing it.	38	14.2
Knowledge	Web-based distance education may be a way to reach more students in Chinese higher education.	81	30.2
Persuasion	Web-based distance education is a way to reach more students in Chinese higher education.	71	26.5
Decision	I know the benefits of Web-based distance education. In the near future, I will try it in my own teaching.	39	14.6
Implementation	I am currently using Web-based distance education and it helps me reach students that otherwise do not have access to higher education programs.	17	6.3
Confirmation	I have used Web-based distance education for more than one semester and plan on continuing to do so.	22	8.2
Total		268	100

Note. Scale: 1 = No Knowledge, 2 = Knowledge, 3 = Persuasion, 4 = Decision, 5 = Implementation, 6 = Confirmation; $M = 2.93$, $SD = 1.42$; six participants did not respond.

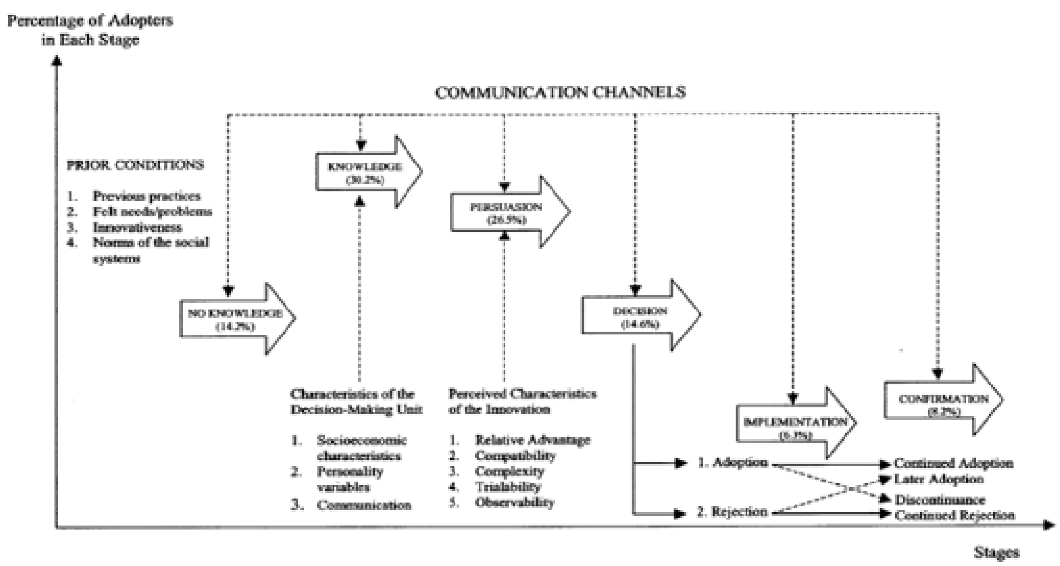

Figure 1. Distribution of Population in the Six Stages of the Innovation-Decision Process (*N*=273)

Note: the figure was based on Rogers' (2003) model of five stages in the innovation-decision process.

Table 3
Distribution of Participating CAU Faculty Members' Stages in the Innovation-Decision Process by Their Professional Area (N = 273)

Stage in the Innovation-decision Process		*n*	*M*	*SD*	*F*	*p*
Professional Area:	Humanities and Social Science	25	3.88	1.54	2.63*	0.00
	Electronic and Electric Engineering	17	3.47	1.59		
	Food Science and Nutrition Engineering	23	3.09	1.31		
	Engineering	16	3.06	1.69		
	Economics and Management	10	3.00	1.63		
	Agronomy and Biotechnology	26	3.00	1.44		
	Veterinary Medicine	14	3.00	1.36		
	Animal Science and Technology	42	2.88	1.29		
	Basic Science and Technology	20	2.70	1.08		
	Resource and Environment	41	2.68	1.47		
	Water Conservancy and Civil Engineering	17	2.24	0.90		
	Biological Science	16	2.00	0.82		

Note. Scale: 1 = No Knowledge, 2 = Knowledge, 3 = Persuasion, 4 = Decision, 5 = Implementation, 6 = Confirmation.
*$p < .05$.

of Resource and Environment ($M = 2.68$, $SD = 1.47$) tended to be in the "persuasion" stage. Faculty from the College of Water Conservancy and Civil Engineering ($M = 2.24$, $SD = 0.90$) and College of Biological Science ($M = 2.00$, $SD = 0.82$) tended to be in the "knowledge" stage.

According to their highest degree earned, faculty members were categorized into three groups (doctoral degree, master's degree, and bachelor's degree). Table 4 shows faculty members' stages in the innovation process differed significantly by level of education, F (2, 257) = 5.05, $p < 0.05$. Faculty with Bachelors' degrees tended to be in later stages in the innovation-decision process than did faculty with Masters' degrees. Faculty with Masters' degrees tended to be in later stages in the innovation –decision process than did faculty with doctoral degrees. A small effect size ($f = 0.20$) was found.

According to their teaching experience, faculty members were categorized into five groups (less than 5 years' teaching experience, 5-9 years' teaching experience, 10-14 years' teaching experience, 15-19 years' teaching experience, and more than 19 years' teaching experience). Table 5 shows faculty members' stages in the innovation-decision process differed significantly by teaching experience, F (4, 247) = 3.93, $p < 0.05$. Faculty with more years of teaching experience tended to be in later stages in the innovation-decision process than did faculty with less years of teaching experience. However, faculty with about 15-19 years' teaching experience tended to be in later stages in the innovation-decision process than did faculty with more than 19 years' teaching experience. A medium effect size ($f = 0.25$) was found.

According to their distance education experience, faculty members were categorized into two groups (with and without distance education experience). Table 6 shows faculty members' stages in the innovation-decision process differed significantly by distance education experience, t (265) = 7.04, $p < 0.05$. Faculty with distance education experience tended to be in later stages in the innovation-decision process than did faculty without distance education experience. A large effect size (f = 0.86) was found.

Table 4
Distribution of Participating CAU Faculty Members' Stages in the Innovation-Decision Process by Level of Education (N = 273)

Stage in the Innovation-Decision Process		*n*	*M*	*SD*	*F*	*p*
Level of Education:	Bachelor	42	3.43	1.60	5.05*	0.00
	Master	69	3.16	1.54		
	Doctoral	149	2.73	1.27		

Note. Scale: 1 = No Knowledge, 2 = Knowledge, 3 = Persuasion, 4 = Decision, 5 = Implementation, 6 = Confirmation.
*p < .05.

Table 5
Distribution of Participating CAU Faculty Members' Stages in the Innovation-Decision Process by Teaching Experience (N = 273)

Stage in the Innovation-Decision Process		*n*	*M*	*SD*	*F*	*p*
Teaching Experience:	< 5	59	2.56	1.22	3.93*	0.00
	5-9	57	2.89	1.32		
	10-14	48	2.88	1.30		
	15-19	40	3.68	1.72		
	> 19	48	2.98	1.47		

Note. Scale: 1 = No Knowledge, 2 = Knowledge, 3 = Persuasion, 4 = Decision, 5 = Implementation, 6 = Confirmation.
*p < .05.

Table 6
Distribution of Participating CAU Faculty Members' Stage in the Innovation-Decision Process by Distance Education Experience (N = 273)

Stage in the Innovation-Decision Process	*n*	*M*	*SD*	*t*	*p*
Distance Education Experience					
Have distance education experience	74	3.81	1.68	7.04*	0.00
Do not have distance education experience	193	2.58	1.12		

Note. Scale: 1 = No Knowledge, 2 = Knowledge, 3 = Persuasion, 4 = Decision, 5 = Implementation, 6 = Confirmation.
*p < .05.

According to their gender, faculty members were categorized into two groups (male and female). As Table 7 shows, faculty members' stages in the innovation-decision process did not differ by gender, t (266) = 0.97, p>0.05. A small effect size (d = 0.11) was found. According to their age, faculty were categorized into six groups (less than 30 years, 30-40 years, 35-39 years, 40-44 years, 45-54 years, and more than 54 years old). Table 7 shows faculty members' stages in the innovation-decision process did not differ by age, F (5, 257) = 1.73, p>0.05. A small effect size (f = 0.18) was found. According to their academic rank earned, faculty members were categorized into three groups (professors, associate professors, and faculty with other titles).

Table 7 shows faculty members' stages in the innovation-decision process did not differ by academic rank, F (2, 265) = 0.12, p>0.05. A negligible effect size (f = 0.03) was found.

Table 7
Distribution of Participating CAU Faculty Members' Stages in the Innovation-Decision Process by Gender, Age, and Academic Rank (N = 273)

Stage in the Innovation-Decision Process		*n*	*M*	*SD*	*t*	*p*
Gender:	Male	175	2.99	1.41	0.97	0.33
	Female	93	2.82	1.44		
Age:	< 30	22	3.32	1.32	1.73	0.13
	30-34	62	2.71	1.26		
	35-39	66	2.71	1.40		
	40-44	64	3.11	1.59		
	45-54	37	3.30	1.54		
	> 54	12	2.67	0.99		
Academic Rank:	Associate Professor	136	2.96	1.51	0.12	0.89
	Professor	70	2.96	1.27		
	Faculty with Other Titles	62	2.85	1.39		

Note. Scale: 1 = No Knowledge, 2 = Knowledge, 3 = Persuasion, 4 = Decision, 5 = Implementation, 6 = Confirmation.

Conclusions and Recommendations

The majority of participating CAU faculty members agreed that limited access to higher education by students was a big problem for Chinese institutions of higher education. Less than one third of faculty, however, disagreed or felt not sure about the problem. Potter (2003) pointed out an important barrier to Chinese higher education is limited access to higher education by high school graduates. The findings supported Potter's (2000) conclusion. CAU faculty members' felt problem about limited access to higher education by students is a good prior condition for faculty's adoption of WBDE. According to Rogers' (2003) model of innovation-decision process, felt needs/problems are important prior conditions for potential adopters' adoption behavior. The stronger one feels the existence of the problem, the more likely he/she would seek information/knowledge related to innovation that could solve the felt problem.

The findings showed that WBDE was perceived by the majority of CAU faculty as a possible key to the limited access problem. Whether it becomes a good solution will depend on other factors beside the felt needs/problem. Rogers (2003) summarized these factors into several categories: (1) prior conditions (previous practices, innovativeness, norms of the social systems); (2) characteristics of the decision-making unit (socioeconomic characteristics, personality variables, communication); (3) perceived attributes of WBDE (relative advantage, compatibility, complexity, trialability, and observability); and (4) communication channels.

The study modified Rogers' (2003) model of five stages in the innovation-decision process by adding a "no knowledge" stage at the beginning of the process. The modified model expanded the innovation-decision process by recognizing the stage when potential adopters had no knowledge about the innovation at beginning of their adoption behavior. Findings showed that one third of participating CAU faculty were in the "knowledge" stage; one quarter of them were in the "persuasion" stage; and about another one third were in the "decision" stage, "implementation" stage, or "confirmation" stage. A minority of faculty members had no knowledge about WBDE. Results indicate that the majority of CAU faculty members were in the early stages in the innovation-decision process, concurring with the fact that WBDE, which started in 2001, is a new innovation at the Chinese Agricultural University.

According to Rogers' (2003) model of innovation-decision process, characteristics of the decision-making unit (socioeconomic characteristics, personality variables, and communication behavior) are important when potential adopters are in the "knowledge" stage, while perceived characteristics of the innovations (relative advantage, compatibility, complexity, trialability, and observability) would be influential for potential adopters in the "persuasion" stage. The findings indicate those faculty members' personal characteristics and their perceptions about attributes of WBDE are crucial for CAU faculty who are in the early stages of the innovation-decision process.

Faculty from different professional areas differed significantly in their stages of the innovation-decision process. CAU faculty overall were in the "persuasion" stage in the innovation-decision process related to WBDE. Faculty from College of Humanities and Social Science indicated that they were in the "decision" stage, while faculty from nine professional areas (Electronic and Electric Engineering, Food Science and Nutrition Engineering, Engineering, Economics and Management, Agronomy and Biotechnology, Veterinary Medicine, Animal Science and Technology, Basic Science and Technology, and Resource and Environment) indicated they were in the "persuasion" stage. Faculty from the remaining two areas (Water Conservancy and Civil Engineering and Biological Science) showed they were still in the "knowledge" stage.

Level of education had a negative impact on faculty members' stages in the innovation-decision process. Faculty members with bachelors' degrees were in later stages of the innovation-decision process than were faculty with Masters or doctoral degrees. Teaching experiences and distance education experiences had positive impact on faculty members' stages in the process. The more teaching experiences faculty had the more they tended to be in the later stages of the innovation-decision process. Faculty who had distance education experiences tended to be in later stages more so than did faculty who had no distance education experience. The study concurred with Rogers' (2003) viewpoint about previous practice as an important prior condition to one's innovation-decision process by finding teaching and distance education experiences having positive impact on faculty members' adoption behavior. The findings indicate that experiences (teaching and distance education) need to be taken into account when considering differences in faculty members' stages in the innovation-decision process. The more teaching and distance education experiences one owns, the more likely it is for him/her to advance through the innovation-decision process.

Gender, age, and academic rank had no significant influence on faculty members' stages in the innovation-decision process related to WBDE. Faculty members' stages however, differed significantly by professional area, level of education, teaching experience, and distance education experience. This study confirmed Rogers' (2003) generalization that earlier adopters are not different from later adopters in age. Similar results were found in Schifter's (2000) study, in which age showed no significant impact on the level of faculty participation in distance education program. The findings indicate that gender, age, and academic rank do not have to be taken into account when considering faculty members' stages in the innovation-decision process. However, impact of professional area, level of education, teaching experience, and distance education experience must be accounted for when thinking of faculty members' stages in the innovation-decision process.

The study challenges Rogers' (2003) generalizations that the relatively earlier adopters in a social system have more years of formal education and have higher social status by finding that (1) level of education showed a significant negative impact on faculty members' stages in the innovation-decision process; and (2) academic rank did not show significant impact on faculty members' stages in the innovation-decision process. The result related to level of education indicates that Rogers' (2003) generalization about the positive impact of formal education on adopter behavior is not always true. The result related to academic rank is consistent with Schifter's (2000) finding that faculty members' academic rank had no significant effect on the level of faculty participation in distance education programs. Both of these findings indicate that social status does not always have a positive impact on one's adoption behavior.

The study expanded Rogers' (2003) generalization about the characteristics of adopter categories by finding that (1) gender did not show a significant impact on faculty members' stages in the innovation-decision process; and (2) professional area showed significant impact on faculty members' stages in the innovation-decision process. Faculty members from social science-related majors generally were more active in adopting WBDE than were faculty with backgrounds in biological science and engineering. The findings confirmed Miller and Miller's (2000) conclusion that curriculum areas in social science are generally more appropriate for telecommunication network delivery than were curriculum areas requiring laboratory, workshop, or hands-on activities.

Additional studies are recommended in these areas: (1) determine why a minority of CAU faculty disagreed or indicated they were not sure about the existence of limited access problems in Chinese higher education system; (2) evaluate innovativeness and norms of the social systems as two other prior conditions that may influence faculty members' stages in the innovation-decision process at the China Agricultural University; (3) conduct longitudinal studies on CAU faculty members' stages in the innovation-decision process after a period five, ten, or twenty years, to assess trends of change; (4) determine why level of education has a negative impact on faculty members' stages in the innovation-decision process; (5) determine how to design online courses for curriculum areas related to engineering or biology; and (6) evaluate how to combine online lecture and lab, workshop, or hand-on activities in engineering or biology related majors.

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AN ANALYSIS OF TECHNOLOGY USE AND QUALITY OF LIFE IN A RURAL WEST TEXAS COMMUNITY

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Abstract

This study was undertaken to measure how much and for what purposes the citizens of Littlefield, Texas, used computers and the Internet and to determine adults' and adolescents' views of their quality of life. The authors used a tool that defined quality of life as, "How good is your life for you?" By determining whether technology use was positively correlated to a resident's view of his or her quality of life, the researchers set out to discover whether greater diffusion of computer technology and adoption of broadband Internet access might provide answers to the youth and leadership migration from rural areas to metropolitan areas.

Introduction

Never in the history of humankind has the world experienced such rapid advancement in technology. Ranging from the discovery and application of natural phenomena such as fire and electricity, to the development of the wheel, most view the adoption of new technologies as a prerequisite for improved quality of life.

With this rapidly advancing growth of technology have come an increased life expectancy and a growing world population. A dramatic improvement in life expectancy occurred during the first half of the 20th century as a result of improvements in public sanitation, personal hygiene and food safety. During the second half the century, new medical technologies such as antibiotics and vaccines were the greatest contributors to disease prevention and a longer life span.

With the secret to longer life becoming less of a mystery, medical scientists and social scientists have begun focusing extensively on quality of life issues. As we enter the 21st century, can technology improve the quality of life in the same way it has increased the quantity or length of life?

As the world's economy shifted from an agrarian society to an industrial-based one and then moved into the information age, populations continued to migrate from rural areas to the cities. Quality of life has become particularly relevant for these small rural communities. Their ability to offer the amenities that average Americans now view as necessities is stretched thin. As more rural youth leave home to secure higher educations, staying in the metropolitan areas where they attend college has become the norm. What has become known as the *brain drain* (Middlebrook, 1999) creates a vicious cycle. As talented young individuals move away to secure education and jobs, rural communities have less and less to offer those remaining and little to attract new individuals.

Based on trends in population, the warp-speed adoption of new Internet-related technologies and a renewed dialogue on quality of life issues, there is an increased curiosity about the relationship between technology (particularly high-speed Internet access), quality of life, and rural community development.

Theoretical Framework

Quality of life as related to this study is based on the definition used by Renwick & Brown (1996). In their study, quality of life is defined as "an overall general well-being comprised of both objective and subjective evaluations of physical, material, social, and emotional well-being, together with the degree to which individuals enjoy the important possibilities of their lives." Raphael, Brown, Renwick, and Rootman (1994) developed a model depicting what they viewed as the essentials of any human being's quality of life. The model included three domains, each having three sub-domains—being: physical, psychological, spiritual; belonging: physical, social, community; becoming: practical, leisure, and growth activities.

A study by Campbell, Converse, and Rodgers (1976) made it clear that experience of life constitutes an individual's perception of quality of life rather than the conditions of life. This study sought to get past the traditionally materialistic approach to evaluating quality of life by measuring the satisfaction level or subjective factors rather than just the experience or objective level.

Certain types of demographic characteristics are positively correlated with quality of life. Research by Campbell and Converse (1972), and Campbell, Converse, and Rodgers (1976) indicate education is positively related to quality of life. Education, income, and occupation status are positively associated with quality of life (Edwards and Klemmack, 1973). Although Campbell (1981) found that college graduates are somewhat more satisfied with their lives than other people, the amount of education otherwise does not have much influence on an individual's general satisfaction with life (Metzen, Bradley, and Helmick, 1986).

Campbell and Converse (1972) found income to be positively related to quality of life indicators, along with race, gender, age, work status, life cycle stages and urbanicity. It is this last indicator that is of prime interest to this research and has the greatest implications for rebuilding rural communities. Results of the 1972 study indicated that respondents living in rural areas were the most satisfied with their quality of life. The Marshall Model builds on Rogers' (1995) Diffusion of Innovations Model in that both view awareness and knowledge as key to educating and activating influential people in a community to adopt worthwhile programs, products, ideas, or technologies. In fact, Rogers says, "The innovation-development process usually begins with recognitions of a problem or need, which stimulates research and development activities designed to create an innovation to solve the problem/need" (p. 132).

Purpose and Objectives

The purpose of this study was to answer four research questions on demographics, use of technology, and quality of life as they related to a sample of high school students and their parents, and a separate random sample from the remaining residents of Littlefield, Texas. The questions were:

1. What are the demographic characteristics of high school students, parents, and other adults in Littlefield, Texas?
2. What is the technology use of students, parents, and other adults?
3. What is the quality of life of students, parents, and other adults?
4. Are there any relationships among the demographic characteristics, technology use, and quality of life of students, parents, and other adults?

Procedures

A descriptive-correlational design was used in this study. The population under consideration consisted of the residents of Littlefield, Texas (*N*=6,507). However, three strategies were used to draw samples from which to collect data. The first set of data was collected as a census of all Littlefield High School students (*N*=433). The second set of data was paired samples consisting of the students' parents, one data collection instrument being provided for each parent living in the home (*N*=866). The third set of data consisted of a random sample of all other residents of the city. City officials provided the city's water billing list, and the mayor approved use of and provided the Littlefield ISD tax roll. Duplicates were eliminated from these two lists, leaving 2,424 households. High school students/parents were deleted from the list (*N*=2,157) before drawing a random sample (*n*=326) from the remaining community population. The total number of questionnaires distributed was 1,951 with a return of 377 completed questionnaires from the three types of respondents—students, parents, and other community adults.

The four-page instrument used in this study consisted of two versions, an adolescent version and an adult version, each with three sections. The first section provided for the collection of descriptive personal, education and employment, and other demographic data. The second section consisted of the Quality of Life Profile (QOLP), a generic measure of health and well-being (Raphael, 1998). The third section assessed the participants' use of technology.

After submitting the data collection instruments to a panel of experts consisting of the researcher's doctoral committee for review, the student version of the instrument was pilot tested with 30 students, and the adult version was pilot tested with 30 graduate students, faculty, and staff within the Department of Agricultural Education and Communications.

The instruments were revised based on revisions suggested by those pilot testing the instruments. Social studies teachers at Littlefield High School then administered the adolescent version of the Quality of Life Profile instrument to each student during social studies classes. Because the study involved individuals younger than 18, permission slips were required for the student to participate. Only data collected from those students with permissions slips was included in the final analysis.

Following completion of the student questionnaires during the school day, packets containing two copies of the adult questionnaire were sent home with the students with a request to return the completed questionnaires in seven days. A cover letter explaining the project and its significance to the community accompanied the questionnaires, along with a disclaimer that participation was voluntary.

Local media were used to promote the return of completed questionnaires. The school principal asked teachers to remind the students each day to have parents complete and return the packets. A raffle ticket which qualified participants for a drawing for the incentives provided by the university and community accompanied the data collection packets.

Following the distribution of student/parent questionnaires, a random sample was drawn from the remaining households in Littlefield using the Krieche and Morgan table to determine the sample size. A total of 326 was needed for an appropriate sample. Graph Pads QuickCalc random number generator (GraphPad Software, Inc., 2002) was used to accomplish random selection. Two adult questionnaires, one for each head of household assuming two-parent families, went to each household in the random sample. Self-addressed, stamped return envelopes were provided for the convenience of the respondents. The researcher adhered to Dillman's (2002) procedures for data collection in an effort to optimize returns.

All statistical analyses of the data were generated using SPSS, Version 12.0. Frequency distributions and descriptive statistics were computed to produce frequency tables for all items on the interview schedule. Pearson product-moment and point biserial correlation statistics were used to describe associations between variables. Effect sizes were calculated for all statistically significant correlations.

The researcher adhered to the Davis Convention (1971) to interpret effect size. Following are the verbal descriptions Davis attached to specific ranges of Pearson's Coefficient levels: 1) .70 or higher – very strong association, .50 to .69 – substantial association, .30 to .49 – moderate association, .10 to .29 – low association, and .01 to .09 – negligible association.

A reliability test was run on the data collection instrument, yielding a Cronbach's Alpha of .965. This is in line with the validity of the original instrument developed by Raphael, D'Amico, Brown, and Renwick (1996) and the study by Smith (1999), which incorporated the adult version of the Quality of Life Profile (QOLP) and yielded a content validity of .96. A 2002 study in Floydada, Texas, by Smith, Kistler, Williams, Edmiston, and Baker (2002) yielded a Cronbach's Alpha of .97 for content validity on the adolescent version of the QOLP. In an effort to handle non-response error as a threat to external validity, the researcher attempted to obtain 20 additional responses as recommended by Lindner, Murphy, and Briers (2001) as the preferred method of handling nonrespondents. Only 14 were obtained. An alternate method recommended in the 2001 study was invoked by defining those respondents received before the first reminder notice (276) was mailed. Those received after (101) were considered late responders. An independent samples t-test was run on these two groups using the variables of interest, and no significant difference was found between early and late respondents. Early and late respondents were grouped together for a total of 377. Because results from nonrespondents tend to be similar to late respondents, the researcher may generalize, albeit cautiously, to the target population.

Findings

There were 377 responses to the data collection instrument used in the Littlefield technology study. Of this total, 126 were students, 141 were parents of students, and 110 were residents drawn at random from the remaining population of Littlefield. Of the total respondents, 203 (53.8%) were female and 174 (46.2%) were male.

The mean age of the respondents to the Technology Use/Quality-of-Life instrument was 37.81 years with a standard deviation of .791. The youngest participant was 14 years old and the oldest was 91. Based on the analysis of descriptive statistics of all participants (N=375), a majority consisting of 204 (54.4%) of the respondents identified themselves as White; 156 (41.6%), Hispanic; 6 (1.6%), African American; 4 (1.1%), Native American; and 5 (1.3%), other.

Only two (1.6%) of the 126 students responding to this question reported being married. In the parent category (n=139), 114 (82%) were married, 15 (10.8%) were divorced and 10 (7.19%) were single. Among community respondents (n=108), 76 (70.4%) were married, six (5.6%) were divorced, and 26 (24.1%) were single. The single status included those who had never been married or who were widowed.

Parent respondents reported a higher number of children than other adults from the community. A large majority, 85 of the other 109 adults in the community, reported no children still living at home.

A majority, 191 (52.9%) of the 361 participants answering this question had jobs. Students reported the highest unemployment level, but perhaps naturally so, because many of them had not yet reached the age of 15, which qualified them legally for employment by the public sector. Even so, 33 students (9.1%) reported having jobs. Parents had the highest employment with 107 (79.3%) of the 135 parents responding yes to the employment question. Other respondents from the community reported a 47.7% rate of employment, with 35.5% of the 107 indicating they were retired.

Salaries of participants were, by far, on the lower end of the salary scale. Fewer than one-half of the participants responded to this question, but it is interesting to note that income figures for these participants fell behind the income trends for technology users reported in the August 2000 U.S. Census Report. Excluding the student population, 36.4% of the respondents reported annual salaries of less than \$20,000. Some 59.2% reported salaries less than \$30,000.

For the most part, the respondents to the questionnaire have a relatively long tenure in Littlefield, with 36.1% of the 363 respondents to the years lived in Littlefield question reporting they had lived in Littlefield more than 20 years.

Given this descriptive overview, the most significant findings of this study related to the overall quality of life reported by the respondents, the knowledge and use of broadband Internet access, and the correlation between quality of life and access to broadband Internet connectivity. Although the basis of this study was an entire doctoral record of study, this article focuses on research questions two, three, and four, which related to the correlation between technology use and quality of life.

Of the 377 individuals participating in this study, 340 quality of life profiles were generated, and, only three individuals, one in each of the student, parent, and other community adult categories, considered their quality of life problematic. There were no responses in the "very problematic" category. There were 22 students, 14 parents, and 10 other adults for a total of 46 (13.5%) with scores in the "adequate" category. Of the 142 (41.8%) scores at the "very adequate" level, 45 were students, 56 were parents, and 41 were other adults in the community. "Excellent" scores numbered 149 (43.8%), and consisted of 48 students, 61 parents, and 40 other adults in the community.

Bivariate correlational analyses were run to determine if there were relationships among demographic variables, technology use, and quality of life. Characteristics included in the analyses were gender, age, ethnicity, marital status, number of children, number of children at home, annual salary, and employment status; a significance level of <.05 was set *a priori*. Because of the apparent differences among the three populations involved in the study, each group was analyzed separately. Correlations between all demographic data, technology use, and overall quality of life scores, along with the strength (effect size) of those correlations, were generated. Only those factors with significant correlations and very strong or substantial associations (effect size of .70 or higher and .50 to .69, respectively) are dealt with here.

Demographics and Technology Use

Age. Community participants showed a negative correlation (r = -.488) significant at the .01 level with a very strong negative association (effect size = -1.12) between age and access to technology.

Grade. This factor applies to student participants only and indicates a negative correlation between grade and Internet access speed at home. The lower the grade, the more likely the students are to have broadband Internet access at home. Correlations between grade and technology use of student participants yielded a Pearson correlation coefficient of -.265 at the <.01 level with an effect size of -0.55, which is a substantial negative association.

Number of Children. For parent participants, there is a negative correlation (r = -.323), i.e., the more children a respondent had, the less likely the respondent was to use technology. This relationship was significant at the .01 level and exhibited a substantial association (effect size = -.68).

Salary. Parents showed a positive correlation between salary and technology use. Merely having access to technology was positively correlated (r = .241) significant at the .01 level with a substantial association (effect size = .50).

Employment. The 134 parents who answered this question reflected a positive correlation with simply having a job and having access to technology. Pearson's coefficient for this relationship (r = .363) was significant at the .01 level with a very strong association between the two (effect size = .78).

Age and Residence. Age and years lived in Littlefield were closely related. Therefore, the findings from the correlation between age and technology use and years in Littlefield and technology use show similarities in their negative correlation. The older a person is or the more years that person has lived in Littlefield, the less likely he or she is to have and use technology.

The study showed a negative correlation -.444 at the .01 level of significance between years lived in Littlefield and the likelihood of the respondent having access to technology and the Internet only. There is a very strong negative association (effect size=-.99) between number of years lived in Littlefield—and by extension, age—and having access to technology.

Demographics and Quality of Life

Significant correlations between demographic characteristics of participants and their reported quality of life were few. Again, only significant correlations with strong or substantial effect sizes have been reported.

Age. Among other adults in the community there existed a positive correlation between age and quality of life. The older an individual is, the higher that person's quality of life score. Pearson's correlation coefficient for this relationship was significant at the .05 level (r = .244) with a substantial association of .50.

Grade. Students showed a very strong negative association between grade and quality of life. The older students exhibited lower quality of life scores. Significant at the .01 level (r = -.475), the 103 students responding to this question indicated a very strong negative association between age and quality of life.

Use of Technology and Quality of Life

There were no significant relationships at the <.05 level among student participants of the Littlefield study. Significant correlations among other categories of participants existed, but were very sparse.

Parent participants showed a positive correlation between having high-speed or broadband Internet access at home and quality of life with significance at the .01 level r = .280). The association between the two variables was substantial (effect size=.58).

Among other adults in the community, having access to technology was negatively correlated with quality of life. This negative correlation measured in a Pearson's coefficient of -.273 at the .01 level with a substantial association (effect size = -.57). Alternatively, as hours of Internet use at work increased, so did quality of life (r = .321) at the .05 level of significance with a substantial association between the two (Effect size = .68). However, because hours of Internet use at work were positively correlated with the hours in an individual's work week, it would be presumptuous to assume a cause and effect relationship between Internet hours at work and quality of life.

Other adults in the community showed a very strong association between high-speed Internet access at home and quality of life. The correlation was .335 at the .05 level of significance and a very strong association (effect size = .71).

The significant results of this study brought forth several conclusions and implications with corresponding recommendations for further research. The study further revealed a model depicting the convergence of the concepts of community, technology, and quality of life, that emerged as common themes of the findings of the study and the literature review reported in Chapter II of the lead researcher's official record of study (Bullock, 2004).

Conclusions

Technology Use

1. Only 22 of the 266 responding to this portion of the questionnaire reported having broadband, 145 reported dial-up, 55 had none, and 44 did not know. It is concluded that there is a low rate of access to broadband at both home and work, and that users are unfamiliar with what broadband and its benefits are.
2. The most frequent use of the Internet, as supported by a preponderance of the literature, was for email. It is concluded from this finding that an important use of the Internet in Littlefield is socialization and that technology serves to enhance quality of life through socialization with family and friends in the local and virtual community.

Quality of Life

The quality of life as perceived by the respondents was high. This conclusion was drawn based on the fact that of the 340 responding, 337 (99.1%) indicated their quality of life was adequate, very acceptable, or excellent.

Demographics, Technology Use, and Quality of life

It was concluded that for the respondents in this study, few relationships existed among demographics, technology use, and quality of life. More could surface with further isolation of less important variables that were measured only at the request of the school and city technology specialists. However, these few should be noted as benchmarks to measure against in future longitudinal studies and in planning technology programs.

1. Technology use, having access to technology (computers + Internet), was negatively correlated with age. The older participants had a negative view of access to technology. However, those who already used technology tended to report a higher quality of life as weekly hours of technology use increased. Therefore, it is concluded that allowing older participants to observe others using technology or being able to try technology for purposes that gratify their personal needs could facilitate their initial adoption and increased weekly hours of technology use.
2. Quality of life scores go down as access to technology use goes up, except for those in the parent and community categories, who reported having broadband Internet access at home. They reported a higher overall quality of life. Although the number of responses to this question was low and should be verified through further quantitative or qualitative investigation, there is some evidence that having broadband Internet access at home improves individuals' perceptions of their quality of life.

Recommendations

Based on the findings, conclusions, and implications of this study, presented below is a recommended model showing how the interaction of real and virtual communities with technology can be used to change rural communities. Also presented are recommendations for further research.

Technology, Communities, and Quality of Life: A Model

Table 1 below is an abbreviated version of the table which lists many of the goods and services offered by traditional communities like Littlefield, Texas, that have counterparts in a virtual world. The short list is not complete but representative of ways real and virtual worlds converge. The possibilities become more numerous as broadband becomes more accessible and as technology becomes more user friendly. Even in its early stages of development this model provides common denominators for community, technology, and quality of life. As broadband becomes more accessible and the adoption of new technologies increases—and the Diffusion of Innovations Theory and current trends indicate they will—the boundaries dividing traditional communities and on-line communities begin to disappear. As hardware and software applications advance to provide an interface more convenient than the traditional mouse tied to a computer that is mounted on a desk Diffusion Theory would suggest that more individuals would use technology that is easy to use and meets their needs.

Continued investigation into this current research project actually revealed three separate studies. An effort has been made to discover characteristics of three important audiences that make up the majority of small rural communities, namely youth, young/middle-aged parents, and the ever-increasing senior population. From this research comes the realization that each of these populations brings with it individual needs. Using an across-the-board approach to diffusion of technology in communities could aid in the pursuit of quality of life. This information will serve as a guidepost for rural community developers anxious to bolster the economic and individual well-being of rural communities' residents.

Table 1. *Common Denominators for Community, Technology, and Three Domains Quality of Life, Technology/Quality-of-Life Study, Littlefield, Texas, 2004.*

Community (traditional)	**Technology (virtual delivery)**	**Quality of Life**
Medical Care	Telemedicine/Teledentistry	Being
Medical Information	WebMD	Being
Safety	Video Security via Internet	Being
Contact with friends/family	Email/Video Conferencing	**Belonging**
Publishing	Blogs	**Belonging**
Shopping	E-commerce (buying)	**Belonging**
Education	Distance Education	Becoming
Local jobs	Telecommuting	Becoming
Virtual Tours	Travel	Becoming

Consequently, the researchers offer the following model—The Bullock-Smith Model for Technology, Community, and Quality of Life—as a means of defining visually the convergence of these three very powerful individual concepts into one dynamic approach that could revolutionize rural America. It reveals the interaction and the symbiotic nature of traditional communities, virtual communities, and advancing technology. This model is a collaborative effort between the researcher conducting this study and her doctoral committee chair, James H. Smith, who conducted an earlier quality-of-life study involving recipients of the Houston Livestock Show and Rodeo Scholarships.

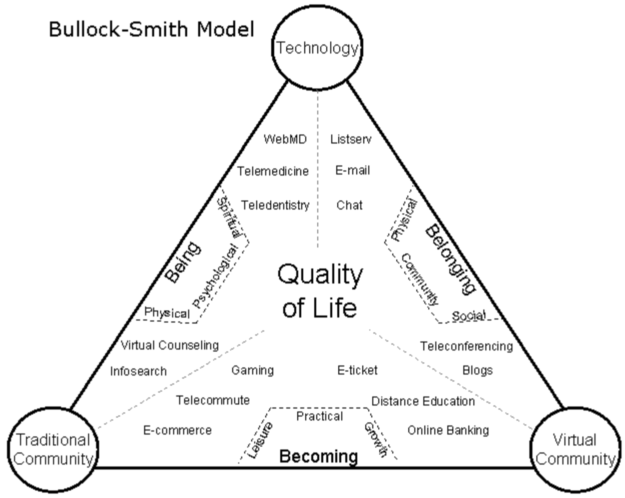

Figure 2. Bullock-Smith Model for Technology and Quality of Life in Communities.

Recommendations for Further Research and Development

1. Determine learning styles of each segment of the rural population with a view toward providing user-friendly training that would assist teens, adults, and seniors in adopting technologies that have the potential for improving their quality of life seamlessly.
2. Replicate this study in other rural communities along the new broadband Internet backbones to determine baseline data for these communities as the infrastructures begin to take shape. Follow-up studies in these communities would reveal the actual effect technology has had on individuals' perceptions of "how good life is" for them.
3. Find ways of bringing computers and the Internet to individual homes rather than placing increasing pressure on the limited public technology facilities of rural communities. Such efforts would make technology more available to populations that remain immobile as a result of age, disability, and other physical and social factors.

Discussion and Implications

The economic, social, and environmental needs of rural West Texas are shifting. The aging population and declining resources such as water and youth, have placed pressures on government to develop new and creative ways of bolstering the declining economies and populations. The exponential growth and development of computers and technology are making virtual communities a concept ripe for harvest.

Enhancing the convenience of technology, in some cases making the hardware invisible, will likely attract older users who currently report being frustrated by their inability to navigate today's computers and Internet access. In addition, as software is designed to meet specific wants and needs of various populations, adoption of technology should increase.

As e-commerce, distance education, telemedicine, teleconferencing come into routine use, residents of rural communities will have less reason to relocate, or even to travel to metropolitan areas. Broadband access has the potential for bringing sustainable economic structures back to declining communities of West Texas while offering a high quality of life.

Many Americans would prefer to live away from the congested environment of metropolitan areas, which are becoming increasingly fraught with the effects of overpopulation (Middlebrook, 1999). It follows that displaced Americans forced to leave the rural areas of their youth to pursue education and gainful employment may return to rural communities if leaders can find a way to create jobs sufficient to support families and offer them those products, services, and creature comforts that tend to bring about a high level of satisfaction with their circumstances or quality of life.

As Internet technology improves in speed and in price to the consumer, the trend is toward accessing those services that are highly correlated with quality of life. Enhancing job satisfaction and training through telecommuting, keeping up with extended family in today's transient society, accessing high quality health care into rural areas via telemedicine, and acquiring entertainment and products not available in the rural areas on a real basis will be key to the longevity and health of rural communities worldwide.

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RELATIONSHIPS BETWEEN STUDENT ACHIEVEMENT AND LEVELS OF TECHNOLOGY INTEGRATION BY TEXAS AGRISCIENCE TEACHERS

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Abstract

The purpose of this study was to determine if agriscience teacher integration of instructional technology was related to student achievement. A survey instrument was developed to collect information on the level at which teachers integrate technology into their instruction. Teachers' demographics, teachers' technology integration skill levels, teachers' administrative use of technology skill levels, and teachers' technology integration levels were collected from a random sample of 150 agriscience teachers in Texas. Student data were collected on 10th grade students in classes taught by the 150 teachers selected to participate in the study. The Texas Education Agency provided all TAAS data. The primary student variables used in the study to quantify math, reading, and writing achievement were the total number of multiple choice items correct for each of these three subject areas. A low positive correlation was found between student achievement in math and teacher instructional technology integration level (.14). Negligible positive correlations ($r < .10$) were found between teacher instructional technology integration level and student achievement on the writing portions and reading portions of the TAAS.

Introduction

Nationally, in 2001, there were 4.2 students for every instructional school computer, and the number of students per Internet-connected computer in schools dropped from 7.9 in 2000 to 6.8 in 2001 (Skinner, 2002). In 2001, the National Assessment of Educational Progress reported that Texas was above the national average with 3.7 students for every instructional school computer (Zehr, 2003). With this increase in instructional technology has been an increased concern for how this technology is being used and the impact that it has on student learning.

Richard Clark (1994) argued that the literature clearly demonstrates that use of instructional media, technologies used to deliver instruction, does not determine learning. Clark stated his argument most clearly as follows:

> "The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in nutrition. . . Only the content of the vehicle can influence achievement" (Clark, 1983, p. 445).

Clark's arguments were not popular among instructional technology researchers, but there is some empirical support for his ideas. In spite of theses findings there has been an increased emphasis on the integration of computers in the curriculum, especially in the ninth through twelfth grades. Educators have placed an emphasis on the need to prepare technologically literate students. Most states have adopted state technology standards and have charged schools with meeting those standards. Texas established the Texas Essential Knowledge and Skills (TEKS). These standards describe what students should know and what skills they should possess when using technology in each grade level.

Theoretical Framework

With a focus on measurable outcomes, behaviorist theory helped to drive the integration of technology into the education system. "Because behaviorists seek to produce observable and measurable outcomes in students, they had a tremendous influence on the development of instructional technology" (Thompson et al., 1996, p. 10).

Researchers have debated for years the role that media has on student learning. Early on, as new technologies were developed and introduced to the education system, researchers typically began investigating the new technologies with media comparison studies. Most of these studies found no significant difference in achievement between instructional opportunities delivered through different mediums. Levie and Dickie (1973) stated that people can learn from a variety of media. Much of the research on different instructional technologies produced similar findings; people can learn when instruction is delivered through computers (Salomon & Gardner, 1986; Schlosser & Anderson, 1994). Researchers in agricultural education have concluded that this holds true for agriscience classes as well. Students can learn through computer-mediated technologies (Murphy, 1999; Zidon & Luft, 1987). Salomon and Gardner (1986) and Schlosser and Anderson (1994) determined that content and instructional variables as well as media play large roles in student learning.

This research prompted many researchers to move from media comparison studies toward studies designed to assess how to most effectively use the technology. As the direction of instructional technology research changed, so did the theories that influenced it.

Clark and Salomon (1986) found that research on learning in education was moving from a behaviorist to a cognitive or constructivist theoretical base. When evaluating student learning from the cognitive learning perspective, learning was viewed as "the degree to which previously learned knowledge and skills can be transferred to new contexts and problems" (Clark & Surgure, 1988, p. 20). Cognitive theory defines learning as a process in which the learner is actively engaged in integrating new knowledge with old knowledge. This view of learning has altered the direction of instructional technology research because student ability, prior knowledge, motivation, and instructional methods are considered to be factors that influence whether or not learning will occur (Clark & Surgrue, 1988). In agricultural education at the collegiate level, Johnson, Ferguson, and Lester (1999, 2000) conclude that students' knowledge of and experience with computing, as well as their self-efficacy in dealing with computing problems, are important in their success in technology-mediated environments.

This study correlated teacher technology integration levels with student achievement. For this reason, this study was grounded in the behaviorist and cognitive learning theories.

Purpose

The purpose of this study was to determine if agriscience teacher use of instructional technology is related to student achievement in math, reading, and writing. To accomplish this purpose, the following objectives were proposed:

1. Determine the technology skill level of Texas agriscience teachers.
2. Determine the current level of instructional technology integration by Texas agriscience teachers.
3. Identify the Texas Assessment of Academic Skills (TAAS) test scores of students who were enrolled in agriscience courses of those teachers surveyed.
4. Determine if relationships exist between instructional technology integration by agriscience teachers and agriscience student achievement.

Methods

Population and Sample

The target population for this study consisted of single teacher agriscience programs, teachers, and their students in public secondary schools in the state of Texas. The accessible population was defined as single teacher agriscience programs in the sate of Texas during the 2002-2003 school year, both the teachers and their tenth grade students. Single teacher programs were selected in order to ensure that student data could be paired to the correct agriscience teacher within a particular school.

The sample frame of teachers was identified using the *Agriscience Teachers Directory System* (AST) housed at Texas A&M University. A sample was drawn by applying random sample techniques as described by Gall, Borg, and Gall (1996). Desired sample size was determined to be 85 by using Cohen's table for determining sample size of a nondirectional study with an alpha of .05 (Cohen, 1988). Over sampling was employed to ensure a large enough final sample size could be obtained. The AST mailing list contained 1,876 names and addresses which served as the population. From the population, a sample of 213 names was randomly selected. After the initial random selection was made, names of 63 teachers were removed from the selection for not meeting the criteria of teaching in a single teacher department. The final sample consisted of 150 agriscience teachers.

The student data used in this study came from tenth grade students of the agriscience teachers in the sample. Tenth graders were selected as the participants because they are required by Texas state law to be tested using the TAAS test near the end of their tenth grade year.

Instrumentation

Teachers were asked to complete a three-part survey instrument. The first section included demographic information such as gender, teaching experience, age, availability of technology to the teacher, availability of technology to the students at the school, type of Internet connection available at the school, and where the teachers learned their technology skills. The second section included questions that were designed to determine the teachers' competence level concerning specific computers skills such as e-mail, word processing, spreadsheets, presentation software, internet, web pages, file management, presentation equipment, and using computers to complete administrative tasks. The third section included questions designed to determine the level at which teachers were comfortable with integrating technology into their teaching. The third section was modeled after the Intel Teach to the Future Scoring Guide for Integration of Technology by Teachers (Intel Teach to the Future, 2002). This third section used behavioral anchored response scales to assess the teachers' technology integration levels.

Reliability was not calculated on section one of the instrument as responses to demographic data by teachers were expected to be reliable and valid. Section two of the instrument had a reliability measure of .95 for the 42 questions measuring teacher technology skill level. Section three of the instrument had a reliability of .93 for the nine items that were used to measure teacher integration of technology.

The instrument used to measure student achievement was the TAAS test as administered by the Texas Education Agency in Spring of 2003.

Collection of Data

For the purpose of collecting data, Dillman's procedures for collecting survey data were used (Dillman, 2000). The initial contact for the final sample of 150 agriscience teachers was made via a packet that was mailed September 12, 2002. Three more mailings and one round of phone calls brought the total number of responses to 97 of the 150 randomly selected or a response rate of 65%. All data collection from teachers was completed by December 31, 2002.

Student data were collected by contacting the Texas Education Agency (TEA) and requesting a data file containing all TAAS data for students whose agriscience teachers participated in the study. The TEA produced data files containing the TAAS test scores for students who met the qualifications of completing the TAAS test in the Spring of 2003 and also who had been enrolled in agriscience class for either or both 2001-2002 and/or 2002-2003 school years. Of the 97 teachers who participated in the mail survey portion of this study, ten were removed from the study, as corresponding student data could not be collected for their students.

Analysis of Data

The data were analyzed using SPSS 11.5 (SPSS, Inc., 2003). The results generated were descriptive, comparative, and correlational. The first portion of the analysis process was descriptive. The survey described the current demographics of Texas agriscience teachers. SPSS 11.5 (SPSS, Inc., 2003) procedure *Frequencies* and *Descriptives* was used to calculate central tendencies, frequencies, and variability. The descriptive analysis was conducted on the demographic portions of the teacher data using SPSS 11.5. SPSS 11.5 procedure *Reliability Analysis* (SPSS, Inc., 2003) was used to determine the internal consistency of each measurement scale. Correlations were calculated using the procedure *Bivariate Correlation* (SPSS, Inc., 2003) to determine significant correlations between teacher data and student data.

Behavioral anchored response scales that range from "1" to "5" were used to make comparisons between technology competence levels of the teachers and technology integration levels of teachers and all data was recoded to a scale of 0 to 1.

Findings

Demographic Characteristics of Teachers

Only three of the teachers were female; 83 were male, one failed to respond to the gender question. The mean age of the 87 teachers was 41.9 years. The mode age range for the agriscience teachers was 31 - 40 years of age, and the median age was 40.7. The teachers possessed an average of approximately 15.0 years of teaching experience with a standard deviation of 10.2 years. Data in Table 1 provide a profile of the 87 participating agriscience teachers in this study.

Table 1
Selected Frequencies of Demographic Characteristics for Texas Agriscience Teachers (N=87)

Demographic Characteristics	f	% "yes"
Gender		
Male	83	95.4
Female	3	3.4
Age		
21-30 years old	16	18.4
31-40 years old	28	32.2
41-50 years old	19	21.8
51-60 years old	24	27.6
Teaching Experience		
1-5 years	21	24.1
6-10 years	14	16.1
11-15 years	13	14.9
16-20 years	11	12.6
21-25 years	13	14.9
26-30 years	3	3.4
31-35 years	9	10.3

Skill Level of Texas Agriscience Teachers

To accomplish the first objective of determining the technology skill level of Texas agriscience teachers, section two of the instrument measured the teachers' technology skill level. Teachers were asked questions measuring their competency on nine technology skill sets: 1) e-mail; 2) word processing; 3) spreadsheets; 4) presentation software; 5) Internet use; 6) creating web pages; 7) file management; 8) presentation hardware; 9) administrative use of technology. The questions asked of participants measured specific technology skills. Participants were asked to respond by circling "Y" for yes, they do possess that skill, or "N" for no, they do not possess that skill. Their responses were coded as "N" = 0 and "Y" = 1; so that if subjects responded "Y" to the five questions regarding word processing then they would have scored a 1.0 on their level of word processing proficiency.

A review of the literature and subsequent reliability analysis suggested that the technology skill portion of the teacher data could be condensed from nine “subscales” to only two measurement scales: 1) Teacher administrative use of technology skills; and 2) Teacher use of technology in instruction skills. Table 2 reports the mean and standard deviation of the two technology skill scales.

Table 2
Descriptive Statistics for Scales Assessing Administrative and Instructional Level of Skills in Technology of Texas Agriscience Teachers (N=87)

Technology Scale	M	SD
Administrative use of technology skill level	.61	.36
Instructional use of technology skill level	.63	.26

Overall, teachers believed that their skill level in administrative use of technology (mean = .61) to be essentially the same as their skill level in use of technology in instruction (mean = .63).

Current Level of Instructional Technology Integration by Texas Agriscience Teachers

To accomplish the second objective of determining the instructional technology integration level of Texas agriscience teachers, section three of the instrument measured the teachers’ level of technology integration. Teachers were asked to rate their own competency on nine technology integration items, with these items being listed in table three.

The questions asked the teachers concerning their level of technology integration used behavioral anchored response scales on a scale of 1 to 5, with 1 being the lowest level of technology integration and 5 being the highest level of technology integration. These responses were then recoded on a scale of 0 to 1 so that comparisons could be made more easily between teacher technology skill levels and teacher technology integration levels. The resulting means listed in table three are on a 0 to 1 scale with 1 being the highest level of technology integration. The N, mean, and standard deviation are reported on each of the nine items and of the scale in Table 3.

The scale score of .46 for the level of technology integration by teachers is lower than both their skill level of administrative use and of integration. In other words, the level at which they have been able to integrate technology into their instruction is less than their level of skills.

Texas Assessment of Academic Skills Test Scores for Students

The Texas Education Agency was contacted to allow accomplishment of the third objective of determining the academic achievement of the students as measured by their TAAS test scores. The TEA produced data files containing the TAAS test scores for students who met the qualifications of completing the TAAS test in the spring of 2003 and also being enrolled in agriscience classes for fall 2001, spring 2002, fall 2002, or spring 2003. Also, the student test scores collected were test scores of students who were enrolled in agriscience classes of the teachers who participated in the study.

Demographic information regarding the students who participated in this study is illustrated in Table 4.

Table 3
Number, Mean, and Standard Deviation for Level of Technology Integration by Texas Agriscience Teachers

Technology Integration Item	N	M	S.D.
1. technology enhances student learning	87	.42	.22
2. technology is important to the lessons	84	.44	.20
3. relationships between technology and learning	86	.42	.22
4. technology is used in the lessons	86	.46	.22
5. lessons require higher order thinking skills	84	.44	.20
6. learning objectives are targeted	84	.40	.20
7. student's work utilizes technology	85	.40	.20
8. objectives align with the TEKS	83	.76	.20
9. obj. align with Tx Standards for Tech. Literacy	85	.36	.24
Technology Integration Scale (alpha = .91)	87	.46	.16

Table 4
Selected Frequency Demographic Characteristics of All Students in Sample (N=3009)

Demographic Characteristics	f	%
Gender		
Male	2040	67.8
Female	969	32.2
Ethnicity		
White, not of Hispanic origin	2128	70.7
Hispanic	653	21.7
African American	200	6.6
American Indian or Alaskan Native	13	0.4
Asian or Pacific Islander	15	0.5
Participated in Free or Reduced Meals		
Not identified as economically disadvantage	2021	67.2
Eligible for Free Meals	798	26.5
Eligible for Reduced-Price Meals	174	5.8
Other Economic Disadvantage	16	0.5
English Proficiency		
Student Identified as LEP	87	2.9
Student Not Identified as LEP	2922	97.1
Special Education		
Student Participating in Special Ed	610	20.3
Student Not Participating in Special Ed	2399	79.7
Gifted and Talented		
Student Participating in Gifted/Talented	228	7.6
Student Not Participating in Gifted/Talented	2780	92.4

Correlations between Instructional Technology Uses by Agriscience Teachers and Agriscience Student Achievement

The individual student names and identification numbers were not provided, but their campus identification numbers were provided. The student and teacher data were paired using the campus identification number. The student variable that was used in statistical analysis for correlations that involved math, reading, and writing was the total number of multiple choice items correct for each of the three subject areas. Table 5 illustrates the teacher technology administrative skills, teacher technology integration skills, and teacher technology integration level correlated with student achievement scores on the TAAS math, writing, and reading scores.

Table 5
Teacher Technology Administrative Skill Level, Teacher Technology Integration Skill Level, and Teacher Technology Integration Level Correlated with Student Achievement Scores on TAAS Math, Writing and Reading, (N=87)

TAAS Sections	Admin. Skill	Integration Skill	Integration Level
Math Total Number Correct	.13	.10	.14
Writing Total Number Correct	.17	.12	.04
Reading Total Number correct	-.01	-.07	-.06

Data are presented on the teachers' level of skill in administrative use of technology and on the teachers' level of skill in integrating technology, but the teacher variable that most directly influences student achievement is the teachers' level of technology integration. While no statistically significant correlations were found at the inferential level for these variables, there were some 'descriptively significant" correlations in this sample (Davis, 1971). Low associations existed between the teachers' ability to use technology for administrative purposes and student math and writing scores on the TAAS. More importantly to the purpose of this study, Table 5 also illustrates a low positive association between how much the teacher actually integrated technology and the students' TAAS math scores. Also of note is that correlations were near 0 between teacher levels of integration of technology and students' reading and writing TAAS test scores.

Conclusions

Measuring teacher technology skills revealed that they were most proficient on Internet use with a mean response of .85, a mean of .81 for e-mail, .79 for word processing, .75 for integration of technology, .69 for file management, .56 for presentation hardware, .52 for presentation software, and a mean score of only .19 for creating web pages. The teachers scored a .61 for administrative use of technology skills and a .63 for instructional use of technology skills.

For student data the three key test categories that were analyzed by the researcher were math, writing, and reading achievement. The student variable that was used was the total number of multiple choice questions that the student answered correctly for each portion of the test. Total number of multiple choice items correct was used for this correlation because it generated the most accurate measurement of the students' actual performance on each portion of the test.

The primary purpose of this study was to determine if relationships existed between agriscience teacher integration of instructional technology and student achievement. The findings of this research show that there was, descriptively, a positive low correlation between student achievement on the math portion of the TAAS and teacher instructional technology integration level ($r = .14$). While Davis (1971) identified correlations of .10 to .29 as low associations, the researcher does recognize the "ambivalence" of low r values with regard to descriptive versus inferential conclusions.

Negligible correlations were found between teacher instructional technology integration level and student achievement on the writing portion and the reading portions of the TAAS.

While there are no cause and effect relationships addressed in this study, the findings of this study do offer support that a positive relationship exists between the level of agriscience teacher technology integration and student achievement in basic academic subjects. This information may help teacher educators better prepare in-service trainings for current agriscience teachers and may also help teacher educators have a better idea of what to teach to their current students.

Recommendations

This study found an r value of .14 for the correlation between student achievement on the math portion of the TAAS and teacher instructional technology level. More research is needed to further explore this relationship. With this correlation in consideration, the following questions are recommended for further research:

1. Could there be a level of diminishing returns when it comes to the amount of technology that agriscience teachers integrate into their curriculum? With the existing curriculum standards that are in place for agriscience courses, it is evident that agriscience teachers already have obligations to what they are responsible for teaching in their classrooms. To what level should agriscience teachers integrate technology in order to maximize the benefit to their students?

2. Teachers scored .61 on administrative use of technology skills and .63 on technology integration skills level. However, they scored only .46 on actually integrating the technology into their curriculum. Therefore, to increase the level of technology integration, should teacher educators shift their focus (if one exists) from teaching new and current agriscience teachers' specific technology skills to a focus on training that involves actual integration of technology in instruction?

3. What is the disconnect that inhibits teachers from integrating instructional technology into the curriculum? Teachers integrate technology at a level far below their technology skill level. If this disconnect can be identified and addressed, then teachers and teacher educators may be able to eliminate it.

4. What is the cost effectiveness of integrating instructional technology into agriscience courses? Are there other variables positively correlated to student achievement that are less expensive per unit of student achievement? Could it be more beneficial to students if educators reallocate yearly technology budgets to pay for more agriscience teaching assistants, supervised agricultural experience projects, or increased agriscience teacher salaries?

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EXTENSION AGENTS' PERCEPTIONS OF FUNDAMENTAL JOB CHARACTERISTICS AND THEIR LEVEL OF JOB SATISFACTION

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Abstract

The purpose of this study was to determine Extension agents' perceptions of fundamental job characteristics and their level of job satisfaction. The study followed a descriptive design. A modified version of the Job Diagnostic Survey developed by Hackman and Oldham (1980) was sent to 195 Extension agents. Based on 143 usable responses, agents perceived the job characteristics skill variety and task significance to be present most in their jobs, while they perceived feedback from agents the least. Agents were most satisfied with the job satisfaction constructs of growth satisfaction and satisfaction with co-worker relations, while they were least satisfied with the job satisfaction constructs of general satisfaction and satisfaction with pay.

Introduction

Job satisfaction can be defined as an individual's attitude about work roles and the relationship to worker motivation. Positive attitudes toward one's job are theoretically equivalent to job satisfaction and negative attitudes toward one's job are equivalent to job dissatisfaction (Vroom, 1964). Employees with higher job satisfaction levels believe that working in their organization will be satisfying in the long run, that they will care about the quality of their work, and that they will be more committed to the organization (Bavendam, 2000). However, as technology and increasing expectations, such as paperwork and travel, continue to place more requirements on jobs, more Americans are becoming dissatisfied with their jobs (The Conference Board, 2003).

The key to job satisfaction in the work place is to focus on changing those areas of work that employees want changed, and not the areas that journalists or behavioral scientists think that employees should want changed (Hackman & Oldham, 1980). Since employee retention and turnover are related to one's level of job satisfaction (Performance Unlimited, 1999), it is important to achieve good person-organization relationships by adapting jobs to people and adapting people to jobs (Hackman & Oldham, 1980). By doing this, employee job satisfaction levels and organization productivity increase, thus benefiting the employee and the employer (Fetsch, Flashman, & Jeffiers, 1984).

Administrators need to understand the level of job satisfaction of their employees. Before organizational changes take place, the anticipated sensitive factors for employees need to be identified and analyzed. By identifying and analyzing these factors, administrators will have an understanding of what their employees want from their work. Understanding what their employees want from work can help administrators develop inservice trainings that will meet the needs of their employees, thus keeping job satisfaction at a maximum while simultaneously reducing job dissatisfaction. Realizing employees' attitudes and behavior during organizational change is imperative in helping administrators plan educational programs that will alleviate possible negative effects of reorganization on job performance (Barnett & Louderback, 1971; Jayaratne & Gamon, 1998).

Studying job satisfaction is important because organizational productivity is influenced by the quality of the relationship between people and the jobs they do. If there is a good fit between people and their jobs, such that work is a personally rewarding experience, then there may be little for management to do to foster high motivation and satisfaction. On the other hand, if there is not a good fit between employees and their jobs and employees are dissatisfied, then there may be little that management can do to produce high productivity and job satisfaction. Internal work motivation is tied closely with how well an employee performs on the job. Therefore, it is important to address the relationship between employees and their jobs before examining other aspects of the work place (Hackman & Oldham, 1980).

Several researchers (Barnett & Louderback, 1971; Bartholomew & Smith, 1990; Gamon & Cassina; 1989; Huerta & Smith, 1994; Hutchins, 1992; Johnson, 1966; King, 1990; Morse, 1987; Rockwell, Furgason, Jacobson, Schmidt, & Tooker, 1993; Taylor-Powell & Richardson, 1990) have studied the job satisfaction of Extension agents after their organization went through a restructuring process. Agents who were reassigned to area work, clustering counties into units, were satisfied with their jobs after the restructuring process. Their reassignment allowed them to develop expertise in a specialized area, allowing them to focus their work more and be more responsive to county concerns (Johnson, 1966; Taylor-Powell & Richardson, 1990). Barnett and Louderback (1971) found agents were most satisfied after restructuring with opportunities for personal growth and with the increased responsibilities that occurred as a result of their new roles. Agents also reported an increase in efficiency, work quality, and more group teaching as a result of multicounty work. Overall, agents had positive attitudes toward restructuring (Bartholomew & Smith, 1990; Gamon & Cassina; 1989; Huerta & Smith, 1994; Hutchins, 1992; King, 1990; Rockwell, Furgason, Jacobson, Schmidt, & Tooker, 1993).

Although restructuring has proven to improve the satisfaction of agents in several states, difficulties have also been discovered. Changes in work context have been primarily associated with job dissatisfaction in Kentucky (Barnett & Louderback, 1971). Lack of time to coordinate statewide issues, work with other issues coordinators, and work as a team were identified as concerns in Texas and Minnesota (Hutchins, 1992; Taylor-Powell & Richardson, 1990), while agents in Ohio mentioned that agent specialization was too time consuming and there was a lack of local support for the new structure (Huerta & Smith, 1994). Program implementation, increased time demands, and poor communication were also identified as areas of difficulty following restructuring in Minnesota and Nebraska (Morse, 1987; Rockwell et al., 1993).

Some studies have examined job satisfaction of Extension agents not involved in the restructuring process (Mallilo, 1990; Riggs & Beus, 1993). Riggs and Beus (1993) found that agents' overall satisfaction with their job, colleagues, and the Cooperative Extension System as an organization was moderately high. However, most agents were more satisfied with the latter two factors than with the job itself. Although Mallilo (1990) also found Extension agents to be moderately to highly satisfied with their jobs in general, he found that the majority of the agents were least satisfied with their pay.

Theoretical Framework

Hackman and Oldham's (1976) job characteristics theory describes the relationship between job characteristics and individual response to work. This theory is probably the most well-known and widely discussed effort to explain the relationship of job characteristics to job satisfaction. The job characteristics theory was originally tested with the intentions of diagnosing jobs to determine if and how they should be redesigned to improve employee motivation and productivity and then later to be used to evaluate the effects of job changes on employees. At the most basic level, five core job characteristics lead to a number of personal and work outcomes that are beneficial to the individual (Hackman & Oldham, 1975; 1976).

A job characteristic is an attribute of a job that creates conditions for high work motivation, satisfaction, and performance (Hackman & Oldham, 1980). According to a job characteristics theory proposed by Turner and Lawrence (1965), employers should build into employees' jobs certain characteristics that create satisfying conditions. Hackman and Oldham (1980) revised this theory and proposed five core job characteristics that should be included in any job. These characteristics include skill variety, task identity, task significance, autonomy, and feedback. However, because people respond differently to the same job, employers must take into consideration both job characteristics and the work context of the job itself when redesigning work for their employees.

Exploration based on Hackman and Oldham's (1975) job characteristics theory can be found in the research conducted by Furgason (1992) on Extension agents in Nebraska. He used a modified version of the Job Diagnostic Survey to ascertain agents' perceptions of the five job characteristics following organizational restructuring. Furgason (1992) found that agents perceived skill variety to be present to a great extent in their jobs, while he found they perceived task identity and task significance to be present in their jobs to a lesser extent. Of all the job characteristics, he found that agents perceived feedback to be present the least.

Hackman and Oldham (1980) also defined the four personal and work outcomes of the job characteristics theory. These outcomes include internal work motivation, growth satisfaction, general satisfaction, and work effectiveness. Internal work motivation indicates an employee's satisfaction when performing well on the job because it is rewarding and satisfying to do so, thus serving as an incentive for continuing to do well. Growth satisfaction indicates employee satisfaction when employees have enriched opportunities for personal learning and growth at work. General satisfaction indicates employee satisfaction when employees indicate how satisfied they are with their jobs and how frequently they think of quitting their jobs. These three affective outcomes combine to form the personal satisfaction constructs. Finally, work effectiveness indicates an employee's satisfaction in both the quality and quantity of goods or services produced (Hackman & Oldham, 1974; 1980).

How satisfied individuals are with certain aspects of their work context may affect their willingness to respond positively to enriched work. Those who are relatively satisfied with job security, pay, co-worker relations, and supervision tend to respond more positively to jobs rating high on the job characteristics, thus having a higher level of context satisfaction. These four aspects of work context combine to form the context satisfaction constructs (Hackman & Oldham, 1980).

At the time of this study, Mississippi's Extension Service was two years removed from restructuring. Prior to reorganization, there was no evidence of Extension agents' job satisfaction. Although agents appeared to be satisfied after being reassigned to their new positions, there was no evidence of studies examining Extension agents' perceptions of various job characteristics and their level of job satisfaction following organizational restructuring in 2002. Therefore, an assessment of agents' perceptions of the job characteristics and their current level of job satisfaction was warranted.

Purpose and Objectives

The purpose of this study was to determine Extension agents' perceptions of fundamental job characteristics and their level of job satisfaction. Specific research questions addressed in this study were:

1. What were the perceptions of Extension agents of the five fundamental job characteristics?

2. What was the level of job satisfaction of Extension agents?

Methods and Procedures

Population

The population for this descriptive study was all Extension agents employed by the Extension Service in Mississippi as of May 1, 2004 ($N = 195$). This included area agents, county directors, and 4-H agents. All 195 were included in the study.

Instrumentation

Extension agents' perceptions of the five job characteristics and their level of job satisfaction were obtained utilizing a modified version of the Job Diagnostic Survey developed by Hackman and Oldham (1980). The Job Diagnostic Survey consists of seven different sections, the first five of which were used in this study. An additional section containing 10 questions created by the researcher was added to the end of the questionnaire to collect selected demographic characteristics of the participants.

Section I contained items for agents to describe aspects of their jobs. In Section II, agents rated statements describing their jobs on a 7-point rating scale ranging from very inaccurate to very accurate. Items from Sections I and II yielded scores for each of the job characteristics. Statements in Sections III and V were rated on a 7-point rating scale ranging from strongly disagree to strongly agree. These two sections were used to measure two (internal work motivation and general satisfaction) of the seven aspects of job satisfaction, also called job satisfaction constructs. Section IV items were rated on a 7-point scale ranging from very dissatisfied to very satisfied. This section yielded scores for the remaining five job satisfaction constructs (growth satisfaction, satisfaction with job security, satisfaction with pay, satisfaction with co-worker relations, and satisfaction with supervision) (Hackman & Oldham, 1980). Section VI items consisted of questions that asked the participants pertinent demographic information.

Scale scores for the job characteristics and the job satisfaction constructs were computed for each agent utilizing the scoring key provided by Hackman and Oldham (1980). The job characteristic, feedback, was classified as either job feedback or feedback from agents. Upon calculating scores for the seven job satisfaction constructs, the first three, internal work motivation, growth satisfaction, and general satisfaction, were categorized as personal satisfaction. The last four, satisfaction with job security, pay, co-worker relations, and supervision, were categorized as context satisfaction (Hackman & Oldham, 1980).

Reliability and Validity

Hackman and Oldham (1974) established internal consistency reliabilities of each of the scales measured by the Job Diagnostic Survey. Oldham, Hackman, and Pearce (1976) later reported reliabilities for two job satisfaction scales not addressed in the initial study, satisfaction with job security and satisfaction with pay. The coefficient alpha for the job characteristics ranged from .59 (task identity) to .78 (feedback from agents). The reliability coefficients for the job characteristics were established as follows: .71 (skill variety); .59 (task identity); .66 (task significance); .66 (autonomy); .71 (job feedback); .78 (feedback from agents). Reliability coefficients for the job satisfaction constructs ranged from .56 (satisfaction with co-worker relations) to .84 (growth satisfaction). Reliability coefficients were established for the seven job satisfaction constructs: .76 (internal work motivation); .84 (growth satisfaction); .76 (general satisfaction); .62 (satisfaction with job security); .82 (satisfaction with pay); .56 (satisfaction with co-worker relations); .79 (satisfaction with supervision) (Hackman & Oldham, 1974; 1975).

The median of the correlations between the items composing a given scale and all the other items that are scored on different scales of the same general type, often called off-diagonal correlations, provide one indication of the discriminant validity of the items included in the Job Diagnostic Survey. The median off-diagonal correlations ranged from .12 (task identity) to .19 (skill variety, autonomy, and job feedback) for the job characteristics. For the job satisfaction constructs, the span of the correlations ranged from .23 (satisfaction with co-worker relations) to .28 (growth satisfaction) (Hackman & Oldham, 1974).

Data Collection

Data collection was accomplished through the use of an electronic survey through SurveyMonkey.com. Prior to data collection, the director of the Extension Service sent an email to all agents notifying them that they would be asked to participate in the study. The email further stated his support for the study and encouraged agents to participate. The initial email from the researcher asking agents to participate in the study was sent the next day. The message included a link to the survey as well as an individual code number. A week later, a second email was sent to those agents who had not responded. A third and final email was sent a week after the second email to the remaining agents who had not responded. The two follow-up email messages also included the link to the survey and the individual code numbers.

Of the 195 agents invited to participate in the study, 168 responded to the survey for an overall response rate of 86%. Due to incomplete data or to participants choosing not to participate, 143 surveys were usable, making the final usable response rate 73%.

Those not responding to the second follow-up email message were declared non-respondents. To handle non-response error, data from those who responded to the initial email message were compared with data from those who responded to either the first or second follow-up email messages. Responses that were collected following both follow-up email messages were used because less than 30 participants responded to the second follow-up email message. According to Linder, Murphy, and Briers (2001), comparing early respondents to late respondents is an acceptable method for addressing non-response error as a threat to external validity. After analyzing the data of early respondents and late respondents, no significant differences were noted.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS® Version 11.5 for Windows). Descriptive statistics, including means and standard deviations, were used to summarize the data. Frequencies and percentages were reported for the demographic data. Means and standard deviations were computed for the job characteristics and the job satisfaction constructs.

Results

Population Description

The largest percentage (41.2%) of the participants identified themselves as county directors, while 32.2% were classified as area agents. 4-H agents accounted for 26.6% of the participants.

Perceptions of the Job Characteristics

Using seven point scales, Extension agents provided mean scores for the job characteristics. Of all the job characteristics, Extension agents rated task significance the highest, whereas they rated feedback from agents the lowest. Means ranged from 4.12 to 6.41 (Table 1). Considering the three groups of agents, 4-H agents rated the job characteristic task significance the highest (M = 6.41, SD = .76), while area agents rated the job characteristic feedback from agents the lowest (M = 4.12, SD = 1.50).

Level of Job Satisfaction

Using seven point scales, Extension agents provided mean scores for the personal job satisfaction constructs. Agents rated growth satisfaction the highest, while they rated general satisfaction the lowest. Means ranged from 5.04 to 6.18 (Table 2). Of the three groups of agents, 4-H agents rated the job satisfaction construct of growth satisfaction the highest (M = 6.18, SD = .71), while county directors rated the job satisfaction construct of general satisfaction the lowest (M = 5.04, SD = 1.16).

Table 1
Means and Standard Deviations of the Job Characteristics for All Agents

Job Characteristic	All Agents (N = 143)	Area Agents (n = 46)	County Directors (n = 59)	4-H Agents (n = 38)
Skill Variety	6.12 (0.76)	5.97 (0.83)	6.29 (0.65)	6.03 (0.78)
Task Identity	5.10 (1.20)	5.36 (1.22)	4.94 (1.21)	5.05 (1.14)
Task Significance	6.31 (0.79)	6.18 (0.91)	6.34 (0.71)	6.41 (0.76)
Autonomy	5.84 (0.83)	5.80 (0.88)	5.77 (0.84)	6.00 (0.77)
Feedback				
Job Feedback	5.21 (0.93)	5.28 (0.97)	5.08 (0.95)	5.31 (0.83)
Feedback from Agents	4.32 (1.47)	4.12 (1.50)	4.35 (1.43)	4.51 (1.51)

Note. Means of the job characteristics were derived from a combination of items contained in Sections I and II of the Job Diagnostic Survey.

Extension agents provided mean scores for the context job satisfaction constructs using seven point scales. Agents rated satisfaction with co-worker relations the highest and rated satisfaction with pay the lowest. Means ranged from 3.70 to 6.60. Of the three groups of agents, 4-H agents rated the job satisfaction construct of satisfaction with co-worker relations the highest (M = 6.60, SD = .51), while county directors rated the job satisfaction construct of satisfaction with pay the lowest (M = 3.70, SD = 1.85).

Conclusions

Overall, Extension agents perceived skill variety to be present in their jobs, meaning that they felt that their jobs require an array of different activities to carry out the work, requiring them to use a number of different skills and talents. This conclusion is consistent with Ferguson's (1992) study, which indicated that Nebraska Extension agents perceived skill variety to be present in their jobs. County directors perceived skill variety to be present more in their jobs than did other agents in the present study.

Extension agents perceived task significance to be present in their jobs, meaning that their jobs have a substantial impact on the lives of other people, whether those people are in the immediate organization or the world at large. A previous study (Ferguson, 1992) found task significance to be present to a lesser extent in the jobs of Nebraska Extension agents. In the current study, 4-H agents believed task significance to be present more in their jobs than did other agents.

Table 2
Means and Standard Deviations of the Job Satisfaction Constructs for All Agents

Job Satisfaction Construct	All Agents (N = 143)	Area Agents (n = 46)	County Directors (n = 59)	4-H Agents (n = 38)
Personal Satisfaction Construct				
Internal Work Motivation	5.56 (0.61)	5.51 (0.65)	5.60 (0.61)	5.57 (0.59)
Growth Satisfaction	6.04 (0.81)	5.92 (0.93)	6.03 (0.76)	6.18 (0.71)
General Satisfaction	5.13 (1.11)	5.20 (1.19)	5.04 (1.16)	5.17 (0.94)
Context Satisfaction Construct				
Job Security	5.45 (1.33)	5.30 (1.35)	5.39 (1.36)	5.71 (1.27)
Pay	3.76 (1.86)	3.76 (1.84)	3.70 (1.85)	3.83 (1.94)
Co-Worker Relations	6.46 (0.60)	6.25 (0.73)	6.53 (0.51)	6.60 (0.51)
Supervision	5.08 (1.76)	4.80 (1.85)	5.21 (1.81)	5.22 (1.54)

Note. Means of two job satisfaction constructs (internal work motivation and general satisfaction) were derived from a combination of items contained in Sections III and V of the Job Diagnostic Survey. Means of the remaining five job satisfaction constructs (growth satisfaction, satisfaction with job security, satisfaction with pay, satisfaction with co-worker relations, and satisfaction with supervision) were derived from items contained in Section IV of the Job Diagnostic Survey.

Extension agents perceived feedback from agents to be present in their jobs the least, meaning they perceived clear information about their performance from supervisors or from co-workers is not as prevalent in their jobs as other job characteristics. This conclusion is consistent with Ferguson's (1992) study, indicating that Nebraska Extension agents perceived feedback to be present in their jobs the least. In the present study, area agents perceived this characteristic the least.

County directors and 4-H agents perceived the job characteristic task identity to be present in their jobs to a lesser extent than the other job characteristics. They felt that their jobs may not require the completion of a "whole" and identifiable piece of work; that is, doing a job from beginning to end with a visible outcome. This conclusion is consistent with Ferguson's (1992) study, indicating that Nebraska Extension agents perceived task identity to be present in their jobs to a lesser extent than the other job characteristics. County directors perceived task identity to be present the least in their jobs in the present study.

Area agents perceived job feedback to be present in their jobs to a lesser extent than the other job characteristics. This means that the work activities required by their jobs may not provide them with direct and clear information about the effectiveness of their performance. This conclusion is consistent with Ferguson's (1992) study, indicating that Nebraska Extension agents perceived feedback to be present in their jobs the least.

Overall, Extension agents were satisfied with their jobs. Extension agents were most satisfied with the personal satisfaction construct of growth satisfaction, meaning they were most satisfied with the opportunities that they have for personal learning and growth at work. This conclusion is consistent with Barnett and Louderback (1971), indicating that agents associated opportunities for personal growth with job satisfaction. In the current study, 4-H agents were the most satisfied with this construct.

Extension agents were the least satisfied with the personal satisfaction construct of general satisfaction, meaning that they were least satisfied with their jobs in general. County directors were the least satisfied with this construct in the current study. The literature points to other researchers who arrived at the same conclusion, indicating that agents were the least satisfied with their jobs in general even though their satisfaction levels were still moderately high (Riggs & Beus, 1993).

Extension agents were satisfied the most with the context satisfaction construct of satisfaction with co-worker relations, meaning that they were the most satisfied with the relations that they have with their co-workers. This conclusion is consistent with other studies that indicate an association between positive co-worker relations and increased job satisfaction (Barnett & Louderback, 1971; Riggs & Beus, 1993). In the present study, 4-H agents were the most satisfied with this construct.

Agents were the least satisfied with the context satisfaction construct of satisfaction with pay, meaning agents were least satisfied with the amount of compensation that they receive for their jobs. The same conclusion was found in Mallilo's (1990) study of Rhode Island Extension agents. In the current study, county directors were the least satisfied with this construct.

Recommendations

Results of this study should be presented to Extension administrators to make them aware of the level of job satisfaction of the agents and to help them understand what agents want from their work. Extension administrators, state specialists, district directors, and others in supervisory positions should then provide more feedback for the agents that they oversee.

Additionally, when there is a budget increase for the Extension Service, top priority should be to provide agents with increased salaries and benefits. In the meantime, Extension agents should provide more feedback for their co-workers regarding their job performance.

When researchers conduct similar studies, outside observers should use Hackman and Oldham's (1980) Job Rating Form to perform objective ratings of the job characteristics to be compared with the ratings by the Extension agents. Future researchers studying job satisfaction should also use Sections VI and VII of Hackman & Oldham's (1980) Job Diagnostic Survey to measure the individual growth need strength of each agent since an agent's individuality affects how he or she responds to his or her job.

This study should be replicated in three to five years to determine if the level of job satisfaction of the agents has remained the same, improved, or worsened. Studies should also be conducted to evaluate why agents leave the Extension Service and to determine why agents who are not satisfied with their jobs remain employed with the Extension Service. Finally, Extension Services in other states should replicate this study.

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TEACHER PREPARATION AND IN-SERVICE NEEDS ASSOCIATED WITH MANAGEMENT OF THE TOTAL PROGRAM OF AGRICULTURAL EDUCATION IN GEORGIA

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Abstract

The purpose of this descriptive census study was to survey agriculture teachers (N = 348) in Georgia to determine perceived level of importance, competence, and pre-service/in-service training needs for a set of non-instructional, agriculture teacher competencies, specifically associated with duties related to managing the "total program" of agricultural education. Sixty one percent of the teachers (n = 212) completed a modified version of Joerger's (2002) Minnesota Beginning Agricultural Education Teacher In-service Programming Needs Assessment instrument, which was based on Borich's (1980) Needs Assessment Model. Mean and Standard Deviation were calculated to indicate teachers' perceived level of importance and competence for each professional competency, while Mean Weighted Discrepancy Scores were calculated to represent in-service and pre-service needs. Teachers considered all of the non-instructional competencies needed for managing the total program of agricultural education important. They also considered themselves at least somewhat competent in each of the competencies. According to the Georgia agriculture teachers in this study, the most important training need for either pre-service teacher education or professional development was advising students about post-secondary education in agriculture. Other highly rated pre-service/in-service training needs included preparing FFA proficiency award applications and FFA degree applications, developing an effective public relations program, and developing Supervised Agricultural Experience (SAE) opportunities for students.

Introduction

Improving university agricultural teacher education curricula and statewide continuing education programs calls for a thorough needs assessment of current practitioners of the "agriculture teaching" craft. As students, teachers, schools, curricula, legislation, and times change, providers of teacher education training must also re-evaluate the content they distribute to pre-service and current agriculture teachers. In fact, the Committee on Agricultural Education in Secondary Schools Board on Agriculture of the National Research Council (1988) stated, "Teacher preparation and in-service education programs must be revised and expanded to develop more competent teachers, … in and about agriculture" (p. 7). Determining what and how to revise and expand for teacher preparation and in-service education is the challenge. Fortunately, some researchers (Dormody & Torres, 2000; Layfield & Dobbins, 2002; Garton & Chung, 1996, 1997) have been successful at determining teacher preparation and in-service needs in their respective states. These researchers recommended that other states replicate the pre-service and in-service needs studies to determine the specific needs of agriculture teachers.

Researchers have investigated a cadre of constructs related to pre-service and in-service needs of agriculture teachers. Dobbins and Camp (2000) indicated a needed understanding in curriculum development, learning styles, technical areas, teaching methods, teaching techniques, and academic integration methods. Edwards and Briers (1999) evaluated the competencies of facilitating student learning in classroom and laboratory settings, facilitating student learning in leadership and personal growth, facilitating student learning in student agricultural experiences, and facilitating teacher competencies related to student services, program management, personal roles and relationships, and planning and managing educational tools. Joerger's (2002) categories of professional teaching competencies needed for success and survival were classroom management, leadership and SAE development, technical agriculture, and program design and maintenance. Roberts and Dyer (2002) conducted a Delphi study of agricultural education experts to determine the characteristics of an effective agriculture teacher. The Roberts and Dyer study categorized effective teaching characteristics into instruction, FFA, SAE, community relations, marketing, professionalism/professional growth, program planning/management, and personal qualities. To date, most studies have attempted to describe all of the necessary teaching competencies for teachers of agriculture. This study evaluated pre-service and in-service needs of teachers associated with the non-instructional planning and management of the total program of agricultural education.

Theoretical/Conceptual Framework

There is more to teaching agriculture than content and pedagogical process. According to espoused theories of other agricultural education researchers (Edwards & Briers, 1999; Garton & Chung, 1996; Greiman, Walker, & Birkenholz, 2002; Joerger, 2002; Layfield & Dobbins, 2002; Mundt & Connors, 1999; Peiter, Terry, & Cartmell, 2003; Roberts & Dyer, 2002) interested in pre-service and in-service needs of secondary agriculture teachers, teaching competency need areas may include (a) planning and managing the FFA program, (b) preparing students for participation in leadership and career development events (CDEs), (c) preparing FFA degree applications, (d) preparing proficiency awards, (e) completing other reports, (f) developing an effective public relations program, (g) managing an advisory committee, (h) managing an adult program, (i) developing and updating curricula, (j) organizing fundraising activities, (k) managing students' SAEs, (l) and building support for the agricultural education program. The theoretical framework for this study specifically draws on the work of Borich (1980), Garton and Chung (1996, 1997), and Joerger (2002).

This study surveyed agriculture teachers in the state of Georgia to determine perceived level of importance, competence, and pre-service/in-service training needs for a set of agriculture teacher competencies, specifically associated with the above duties related to managing the "total program" of agricultural education. Ensuing paragraphs detail the findings of other researchers seeking to provide more effective pre-service and in-service training for agriculture teachers.

Teachers receive little program management assistance in many areas related to agricultural education from their respective school districts (Greiman et al., 2002). According to a Delphi study of outstanding teachers, managing the overall activities of the local FFA chapter was the top training need, and thus should be addressed (Mundt & Connors, 1999). Edwards and Briers (1999), Joerger (2002), and Peiter et al (2003) found that planning and managing the work of an FFA program is a major in-service need.

Preparing students for participation in Career Development Events (CDEs) is another area teachers perceive they need more training. From organizing and planning for FFA officer elections to training for the next floriculture contest, Edwards and Briers (1999) and Peiter et al. (2003) reported that preparing students for participation in CDEs was a major in-service need. The effective teacher Delphi of Roberts and Dyer (2002) concurred; they believed that the ability to prepare students to be successful in CDEs was crucial.

Preparing FFA degree applications has been reported to be a highly rated in-service need of beginning teachers (Garton & Chung, 1996; Layfield & Dobbins, 2002; Peiter et al., 2003). Additionally, preparing FFA proficiency awards was reported as a need area and major concern for beginning teachers in Missouri (Garton & Chung, 1996), Minnesota (Joerger, 2002), South Carolina (Layfield & Dobbins, 2002), and Oklahoma (Peiter et al., 2003). However, when teachers of all experience levels were evaluated, the findings varied (Washburn, King, Garton, & Harbstreit, 2001). Washburn, et al. found that preparing degree applications and proficiency awards was ranked 1st in Kansas, but 22nd in Missouri as a training need.

FFA degree applications and proficiency awards are not the only forms of paperwork for agriculture teachers. Teachers are inundated with reports in the name of local, state, and federal accountability. Completing reports was the highest rated in-service need of beginning teachers in Missouri (Garton & Chung, 1996). Garton and Chung (1997) determined completing reports for local and state administrators was the most pressing issue in their study. Layfield and Dobbins (2004) agreed that training related to completing reports for local/state/federal accountability was needed.

Agriculture teachers also have to promote their total program of agricultural education. Developing an effective public relations program was a highly rated in-service need of both beginning and experienced teachers, according to Garton and Chung (1996) and Layfield and Dobbins (2002). Additionally, state agricultural education staff believed that training to help teachers develop an effective public relations program was an important need (Garton & Chung).

Advisory committees help agriculture teachers plan their program, but teachers rarely receive training in managing those committees. Unlike teachers, state agricultural education staff in Missouri believed training, which taught prospective and future teachers how to utilize a local advisory committee, was also one of the top in-service needs of agricultural education teachers (Garton & Chung, 1996). Still, teachers in other states identified in-service training in advisory committee management as an important need (Joerger, 2002; Layfield & Dobbins, 2002).

In some states adult education is still an important part of the total program of agricultural education. According to the literature, adult education was another area needing more training (Findlay & Drake, 1989; Garton & Chung, 1996; Layfield & Dobbins, 2002). State joint staff in

Missouri listed management of the adult program as an important in-service need for that state, as beginning agriculture teachers in Missouri did not rate this as important as the state staff (Garton & Chung, 1996). However, researchers have reported that agriculture teachers in Alabama, Florida, Georgia, and South Carolina indicated a competency deficiency in managing the adult program, (Findlay & Drake, 1989; Layfield & Dobbins, 2002).

In their undergraduate teacher preparation program agriculture teachers received one course, maybe two which addressed developing agricultural education curricula in their undergraduate/graduate program. However, developing and updating curricula continues to be a reported training need for teachers. Edward's and Briers' (1999) study found that implementing new curricula is a major in-service need. Peiter et al. (2003) determined that new teachers needed to know how to offer a variety of courses to attract students, and how to modify curricula to meet changes in technology. Washburn et al. (2001) found that teachers of agriculture believe that modifying the curricula to meet changes in technology and to attract and retain quality students were of utmost importance.

Agricultural education faculty and state directors continue to tout the importance of agriculture teachers maintaining a SAE program for all students, but teachers persist in their struggle with this competency. Layfield and Dobbins (2002) determined that beginning teachers perceived that they needed help becoming acquainted with strategies for developing SAE opportunities for students. South Carolina teachers (Layfield & Dobbins, 2002) also felt they needed in-service assistance with learning how to supervise SAE programs. Peiter et al. (2003) listed selection of SAE projects, supervision of projects, and livestock show procedures as areas where new teachers could use help.

Studies have also indicated that teachers need help developing personal and monetary support for their agricultural education program. Mundt's and Connors' (1999) and Joerger's (2002) studies indicated that building support from faculty, counselors, and administrators in the school, as well as parents, organizations, and other adult groups in the community, was a major concern needing to be addressed by in-service. According to Peiter et al. (2003), the support-building skill of improving the image of the program was another area where teachers could use help. Additionally, Layfield and Dobbins (2002) and Peiter et al. (2003) discovered that teachers needed help with organizing fundraising activities for the local FFA Chapter.

Purpose and Objectives

The purpose of this descriptive census study was to survey agriculture teachers in the state of Georgia to determine perceived level of importance, competence, and pre-service/in-service training needs for a set of non-instructional, agriculture teacher competencies, specifically those associated with duties related to managing the "total program" of agricultural education. Specific objectives of this study were the following:

1. Describe the demographic characteristics of Georgia agriculture teachers.
2. Describe the perceived level of importance Georgia agriculture teachers place on competencies associated with managing the total program of agricultural education.
3. Describe the perceived level of competence Georgia agriculture teachers have for competencies associated with managing the total program of agricultural education.

4. Describe the perceived pre-service and in-service needs of Georgia agriculture teachers.

Procedures

The population of this descriptive census study included the 348 middle school and/or high school agriculture teachers employed during the 2004-2005 school year in the state of Georgia. Surveys were distributed and collected at the Georgia Vocational Agriculture Teachers Conference, regional agriculture teacher meetings, and via an online version of the instrument.

A modified version of the *Minnesota Beginning Agricultural Education Teacher In-service Programming Needs Assessment* (Joerger, 2002) was used to survey the teachers. This Joerger instrument was modeled after the 1996/1997 Garton and Chung instrument, which was based on the Borich Needs Assessment Model (Borich, 1980). This study combined the FFA/leadership development/SAE category with the program management category of Joerger (2002) to create a set of items which depict the non-instructional competencies of agriculture teachers associated with managing the total program of agricultural education. A panel of experts consisting of four University of Georgia faculty, two graduate students, three regional coordinators of agricultural education, and four agriculture teachers were used to determine the face and content validity of the instrument. Cronbach's alpha was calculated to determine the reliability of importance ($\alpha = 0.94$) and competence ($\alpha = 0.94$) scales. The 27 items of the instrument were constructed with two Likert-type scales ranging from one to five that measured teachers' perceptions of the importance of the competencies as well as their level of competence in each of the competencies.

The data collected were entered into SPSS 12.0™. Mean and standard deviation were calculated to determine the competencies that teachers perceived to be important. Additionally, mean and standard deviation scores were calculated to determine the competencies in which teachers perceived themselves to be competent. In order to determine the in-service and pre-service needs of Georgia agriculture teachers, a mean weighted discrepancy score (MWDS) was calculated. The MWDS score was calculated by subtracting the competency score from the importance score and by multiplying that number times the mean importance rating for each competency (Borich, 1980; Joerger, 2002).

There were 212 respondents out of 348 middle school and/or high school agriculture teachers in the population, yielding a response rate of 61%. To address non-response early respondents ($n = 121$) were compared to late respondents ($n = 91$) using an independent samples t-test. Lindner, Murphy, and Briers (2001) and Miller and Smith (1983) reported that responses of late respondents are often similar to non-respondents, and reasoned that if there is not a difference between early respondents and late respondents, then there is little need to pursue additional efforts to increase responses from non-respondents. With the exception of one item on the competence scale, no other significant differences were found between early and late respondents. The one item within the competence scale, "Utilizes alumni and/or young farmer affiliate" was significantly different when early ($M = 3.27$, $SD = 1.16$) respondents were compared to late ($M = 3.61$, $SD = 0.984$) respondents, $t\,(206) = -2.21$, $p < 0.05$, $d = 0.35$.

Findings

Georgia agriculture teachers are mostly male (74.5%), and were represented by each age category (See Table 1). Sixty percent of the agriculture teachers had ten years teaching experience or less, and thirty-five percent of agriculture teachers had five or less than five years of teaching experience. All of the respondents had at least a Bachelor's degree and over half (57.6%) had at least one graduate degree.

Table 1
Selected Teacher Demographics

Demographic Characteristics		**F**	%
Gender	Male	158	74.5
	Female	54	25.5
Age	Less than 25	29	13.7
	25 to 34	60	28.3
	35 to 44	51	24.1
	45 to 54	58	27.4
	55 to 64	16	7.5
	More than 65	2	0.9
Teaching Experience	Less than 5 years	74	34.9
	6 to 10 years	36	17.0
	11 to 15 years	26	12.3
	16 to 20 years	20	9.4
	21 to 35 years	26	12.3
	26 to 30 years	25	11.8
	More than 30 years	5	2.4
Highest Degree Earned	Bachelors	90	42.5
	Masters	78	36.8
	Specialist	32	15.1
	Doctorate	12	5.7

Teachers considered all of the competencies needed for managing the agricultural education program to be important. According to these teachers, the most important competency was conducting local FFA chapter activities (M = 4.70, SD = 0.49), followed by developing an effective public relations program (M = 4.63, SD = 0.59) and developing relationships with fellow teachers and administrators (M = 4.60, SD = 0.58). According to Table 2, organizing fundraising activities for the local FFA chapter (M = 4.59, SD = 0.55) and supervising students' SAE programs (M = 4.58, SD = 0.58) round out the top five list of most important competencies. Table 2 lists teachers' perceived level of importance for each competency.

Teachers considered themselves at least somewhat competent in each of the non-instructional competencies related to managing a total program of agricultural education. They believed they were most competent at developing relationships with fellow teachers and administrators (M = 4.20, SD = 0.77). Teachers also considered themselves competent conductors of local FFA chapter activities (M = 4.14, SD = 0.73); competent planners of FFA banquets (M = 4.05, SD = 0.82); competent report completers (M = 3.97, SD = 0.82); as well as competent fundraisers for the local FFA chapter (*M* = 3.96, *SD* = 0.82). Teachers felt least competent at establishing and organizing an agricultural co-op/internship (*M* = 3.05, *SD* = 1.05), developing a variety of curriculum-based School-to-Work activities (*M* = 3.12, *SD* = 0.99), and preparing FFA proficiency awards (*M* = 3.28, *SD* = 1.02) and degree applications (*M* = 3.36, *SD* = 0.97).

Table 2
Agriculture Teachers Perceived Level of Competency Importance

Professional Competency	*n*	*M*	*SD*
Conducting local FFA chapter activities	210	4.70	0.49
Developing an effective public relations program	210	4.63	0.59
Developing relationships with fellow teachers and administrators	209	4.60	0.58
Organizing fundraising activities for the local FFA chapter	210	4.59	0.55
Supervising students' SAE programs	210	4.58	0.58
Developing SAE opportunities for students	209	4.55	0.60
Preparing FFA CDE teams	209	4.54	0.59
Professional Competency	*n*	*M*	*SD*
Integrating life skills into curriculum	210	4.53	0.67
Evaluating the local agriculture program	209	4.46	0.63
Planning banquets	210	4.43	0.63
Ability to use the local advisory committee to acquire resources to sustain the local program and FFA chapter	209	4.42	0.64
Teaching record keeping skills	210	4.42	0.66
Establishing a program advisory committee	209	4.42	0.70
Providing guidance to students interested in post-secondary education in the food, fiber and natural resource industries	209	4.41	0.65
Determining the content that should be taught in specific courses	209	4.40	0.62
Completing reports for local and state administrators	210	4.39	0.68
Teaching about public issues related to agriculture	210	4.37	0.65
Preparing FFA degree applications	210	4.35	0.66
Embedding graduation standards in the agriculture curriculum	209	4.32	0.73
Coordinating activities with local agricultural organizations/agencies	210	4.31	0.76
Preparing FFA proficiency award applications	210	4.29	0.69
Locating and selecting student references and materials	210	4.26	0.64
Providing career exploration activities in agriculture	210	4.22	0.72
Utilizing a local alumni or young farmer affiliate	210	4.20	0.89
Conducting assessments to determine the courses that should be taught	210	4.10	0.77
Developing a variety of curriculum-based School-to-Work activities	210	3.98	0.84
Establishing and organizing an agricultural co-op/internship	209	3.94	0.91

Note. 1 = not important and 5 = very important.

Pre-service/in-service need is represented by the MWDS. The MWDS score was calculated by subtracting the competency score from the importance score and by multiplying that number by the mean importance rating for each competency (Borich, 1980; Joerger, 2002). The highest rated pre-service/in-service training need was that of providing guidance to students interested in post-secondary education in the field of agriculture. Teachers also indicated a need for pre-service/in-service training in preparing FFA proficiency awards (2nd highest need) and degree applications (3rd highest need). Rounding out the five most important needs were training in developing an effective public relations program and developing SAE opportunities for students. Table 4 lists competencies in descending order from most needed to least needed.

Table 3
Agriculture Teachers Perceived Level of Competence for Total Agricultural Education Program Competencies

Professional Competency	*n*	*M*	*SD*
Developing relationships with fellow teachers and administrators	209	4.20	0.77
Conducting local FFA chapter activities	211	4.14	0.73
Planning banquets	211	4.05	0.82
Completing reports for local and state administrators	211	3.97	0.82
Professional Competency	*n*	*M*	*SD*
Organizing fundraising activities for the local FFA chapter	211	3.96	0.82
Supervising students' SAE programs	210	3.95	0.76
Integrating life skills into curriculum	211	3.95	0.78
Preparing FFA CDE teams	211	3.85	0.77
Determining the content that should be taught in specific courses	210	3.82	0.76
Establishing a program advisory committee	210	3.82	0.95
Evaluating the local agriculture program	209	3.80	0.85
Developing SAE opportunities for students	211	3.78	0.79
Developing an effective public relations program	210	3.73	0.83
Locating and selecting student references and materials	210	3.70	0.79
Teaching about public issues related to agriculture	211	3.67	0.83
Coordinating activities with local agricultural organizations/agencies	211	3.64	0.83
Teaching record keeping skills	211	3.64	0.81
Providing guidance to students interested in post-secondary education in the food, fiber and natural resource industries	210	3.61	0.84
Ability to use the local advisory committee to acquire resources to sustain the local program and FFA chapter	209	3.58	0.96
Embedding graduation standards in the agriculture curriculum	210	3.49	0.91
Conducting assessments to determine the courses that should be taught	210	3.47	0.92
Providing career exploration activities in agriculture	211	3.44	0.88
Utilizing a local alumni or young farmer affiliate	208	3.41	1.10
Preparing FFA degree applications	211	3.36	0.97
Preparing FFA proficiency award applications	211	3.28	1.02
Developing a variety of curriculum-based School-to-Work activities	211	3.12	0.99
Establishing and organizing an agricultural co-op/internship	210	3.06	1.05

Note. 1 = not competent and 5 = very competent

Table 4

Pre-service and In-service Training Needs of Agriculture Teachers (N = 212)

	MWDS[1]
Providing guidance to students interested in post-secondary education in the food, fiber and natural resource industries	4.40
Preparing FFA proficiency award applications	4.21
Preparing FFA degree applications	4.21
Developing an effective public relations program	4.13
	MWDS[1]
Developing SAE opportunities for students	4.10
Ability to use the local advisory committee to acquire resources to sustain the local program and FFA chapter	3.67
Embedding graduation standards in the agriculture curriculum	3.49
Utilizing a local alumni or young farmer affiliate	3.41
Establishing and organizing an agricultural co-op/internship	3.39
Teaching record keeping skills	3.36
Developing a variety of curriculum-based School-to-Work activities	3.34
Providing career exploration activities in agriculture	3.20
Teaching about public issues related to agriculture	2.97
Preparing FFA CDE teams	2.89
Evaluating the local agriculture program	2.88
Supervising students' SAE programs	2.85
Coordinating activities with local agricultural organizations/agencies	2.84
Organizing fundraising activities for the local FFA chapter	2.75
Conducting assessments to determine the courses that should be taught	2.55
Integrating life skills into curriculum	2.55
Establishing a program advisory committee	2.52
Conducting local FFA chapter activities	2.48
Determining the content that should be taught in specific courses	2.41
Locating and selecting student references and materials	2.35
Developing relationships with fellow teachers and administrators	1.80
Completing reports for local and state administrators	1.72
Planning banquets	1.57

[1]Mean Weighted Discrepancy Score

Conclusions

Georgia agriculture teachers are mostly male and well educated, and a large majority of participants had no more than ten years of experience. Teachers considered all of the non-instructional competencies needed for managing the total program of agricultural education to be important. Most important to teachers was conducting local FFA chapter activities. Teachers considered themselves at least somewhat competent in each of the competencies related to managing a total program of agricultural education. Teachers felt most competent developing relationships with fellow teachers and administrators, conducting local FFA chapter activities, planning banquets, completing reports, and organizing fundraising activities. They felt least competent at preparing FFA degree and proficiency award applications, developing curriculum-based school-to-work activities, and establishing and organizing an agricultural co-op/internship.

According to the Georgia agriculture teachers in this study, the most important training need for either pre-service teacher education or professional development was advising students about post-secondary education in agriculture. The researchers of this study found no other studies indicating such a high need for training to help teachers aid students in making decisions about studying agriculture at the post-secondary level. Teachers' responses indicate that more pre-service and in-service training opportunities are needed to help them aid students in preparing FFA proficiency award applications and FFA degree applications. Garton and Chung (1996), Layfield and Dobbins (2002), Joerger (2002), and Peiter et al. (2003) determined that teachers in their respective states needed training related to preparing FFA proficiency awards and degree applications as well. Similar to this study, other agricultural education researchers have also found that developing an effective public relations program (Garton & Chung, 1996; Layfield & Dobbins, 2002) and developing SAE opportunities for students (Layfield & Dobbins; Peiter, et al., 2003) were important training needs.

Implications and Recommendations

With the number of middle school and high school agricultural education positions on the rise in Georgia, the large number of teachers who have no more than ten years experience in the state immediately indicates a need for re-evaluating the pre-service agricultural education program and the professional development opportunities offered by the Georgia Department of Agricultural Education. Recommendations are specific to and appropriate for agricultural education in Georgia, but other states may also benefit from the suggestions that follow.

According to this study, the most important pre-service/in-service need is training that provides guidance to students interested in post-secondary education in the food, fiber and natural resource industries. This competency should be addressed in university teacher preparation curricula in Georgia. Faculty should invite post-secondary recruiters from all state institutions offering majors related to agriculture to end-of-student teaching seminars and/or other agricultural education courses. It would also be helpful if pre-service teachers developed an understanding of all of the agricultural education possibilities beyond the high school level while they were on location at their respective post-secondary institution. Additionally, professional development programs should be regularly offered to current teachers, programs which detail the post-secondary agricultural opportunities. Future research will specifically define items that should be shared with students, which concern education opportunities at the post-secondary level.

Georgia agricultural education faculty need to modify curricula to more effectively educate students on how to complete the FFA proficiency awards and degree applications. Additionally, "State departments, university faculty, and National FFA Organization officials should conduct workshops or other in-service activities" to assist current teachers with completing FFA proficiency awards and degree applications (Clark & Scanlon, 1996, p. 15). Upon completion of additional and appropriate training, future, longitudinal research will be used to monitor teachers' and students' competencies associated with completing FFA proficiency awards and degree applications.

Institutions with access to agricultural communications faculty, students, and resources may be capable of helping pre-service and current agriculture teachers more fully develop their ability to develop a strong public relations program. Pre-service courses of study could include an agricultural communications course that addresses public relations skills and abilities. Conceivably, agricultural communications faculty could assist agricultural education faculty and state staff with professional development opportunities which address the public relations need.

Again, developing SAE opportunities for students (Layfield & Dobbins; Peiter, et al., 2003) is found to be an important need. Teacher education faculty in Georgia ought to infuse agricultural education courses with specific strategies and examples of SAE opportunities for students. Distributing specific techniques and examples of SAE opportunities for current teachers would also assist with this in-service need. Workshops at the summer teachers' conference, emailed ideas over the state agricultural education listserv, or possibly even a website which shares SAE opportunities with teachers may all be viable options for providing teachers additional help in developing SAE opportunities for students.

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A COMPARISON OF TEACHER EFFICACY OF TRADITIONALLY AND ALTERNATIVELY CERTIFIED AGRICULTURE TEACHERS

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Abstract

The shortage of qualified teachers in agricultural education has led to the hiring of uncertified teachers to fill vacancies. Many states have resorted to alternative certification routes to fill the need for teachers. In Florida, alternatively certified teachers represent over half of all new teachers in agricultural education. This situation has created uncertainty about the status of agricultural education in the state and provided the motivation for this study. The purpose of this study was to describe traditionally and alternatively certified Florida agriculture teachers, compare their perceptions of teacher efficacy, and examine the relationship between teaching experience and teacher efficacy. Data analysis found that traditionally and alternatively certified teachers differed in age, education level, agricultural occupational experience, and gender and ethnicity proportions. Comparison of teachers' self-efficacy found no notable difference between the two groups. Results also showed a low positive association existed between agriculture teaching experience and teacher efficacy. Suggestions for future research include the need for replication of the study with other beginning teachers, increased recruitment of underrepresented populations into teacher preparation programs, and investigation of the curriculum and teaching practices of traditionally and alternatively certified teachers as they may impact teachers' perceptions of efficacy and student achievement.

Introduction/Theoretical Framework

Agricultural education faces an ongoing shortage of qualified teachers to accept positions in the profession (Camp, Broyles, & Skelton, 2001). This dilemma is no more apparent than in Florida, where in 2002, 11 agricultural education students completed undergraduate requirements for certification and entered the teaching profession. In the meantime, the number of agricultural teaching openings grew to approximately 40 statewide (J. Dyer, personal communication, September 23, 2003). Due to this lack of sufficient university-prepared teacher candidates, school administrators hired uncertified teachers to fill vacancies that might otherwise go unfilled (Roberts & Dyer, 2003). Twenty percent of new vocational education teachers hired in Florida in 2001 were not certified in the field to which they were assigned to teach. This represents a significant increase from prior years as this percentage has nearly doubled in the past ten years (Florida Department of Education, 2002).

This situation has created uncertainty about the state of agricultural education in Florida, particularly in regard to uncertified teachers' abilities to effectively deliver curricula, supervise agricultural experience programs, and advise FFA leadership programs and events (McLean & Camp, 2000). Unfortunately, agricultural education is not unique in facing this challenge. The Florida Department of Education (2002) reported critical secondary teacher shortages existed in the subjects of mathematics, science, special education, English for speakers of other languages (ESOL), foreign language, and technology education/industrial arts.

To meet the demand for teachers, many states have resorted to alternative means of teacher certification in hopes of recruiting more teachers into the field. In 2003, 46 states and the District of Columbia reported having some type of alternative certification process for certifying elementary and secondary teachers. These states reported a total of 144 certification routes other than traditional university teacher education programs exist in the United States (National Center for Education Information, 2003).

The influx of alternatively certified teachers entering the teaching profession has stimulated researchers to investigate possible implications, however these studies have yielded mixed results (Nakai & Turley, 2003). In their study of 3,000 beginning teachers, Darling-Hammond, Chung, and Frelow (2002) found that traditionally prepared teachers were more successful and more highly rated than teachers who entered teaching through alternative programs or without preparation. Furthermore, traditionally prepared teachers were found to be superior to alternatively prepared teachers in nearly every dimension of teaching, classroom management, curriculum and assessment development, use of teaching strategies, awareness of differing learning styles, and their knowledge of students. Ashton (1996) came to a similar conclusion finding that state certified teachers received higher supervisor ratings and had higher student achievement than those who did not meet state certification standards.

Conversely, Miller, McKenna, and McKenna (1998) concluded from their comparison of traditionally and alternatively certified teachers that after a three-year period, no distinguishable differences in observable teaching behaviors, student achievement, or self-perceived teacher competence were evident. In their examination of numerous teacher characteristics and student achievement studies, Wayne and Youngs (2003) found students learned more from teachers with certain characteristics; however results for teacher certification were inconclusive in all subjects except mathematics. Goldhaber and Brewer found that students whose teachers had a bachelor's degree in mathematics learned more than students whose teachers had bachelor's degrees in nonmathematical subjects (as cited by Wayne & Youngs, 2003).

Although studies such as the aforementioned have shown to be inconclusive in many fields of education, no such research is evident in agricultural education. Agricultural education is a unique field requiring various competencies not typical in other academic areas (Harper, Weiser, & Armstrong, 1990). The comprehensive agricultural education program includes experiential learning and leadership development components not found in any other discipline (Phipps & Osborne, 1988). These additional program components provide unique challenges for agriculture teachers. These added expectations make agriculture teachers different from any population studied in other disciplines.

Even with these additional expectations and responsibilities, effective agricultural teachers feel capable of handling the challenges associated with teaching agriculture and they cope easily with the changing situations in the classroom environment (Miller, Kahler, & Rheault, 1989). Furthermore, Miller and colleagues reported that effective agriculture teachers were found to be older than the average agriculture teacher and possessed more teaching experience.

Knobloch and Whittington (2002) found novice agriculture teachers who had teaching and student teaching experience were more confident than teachers with a lack of such experience. Similarly, in a 2003 analysis of the School and Staffing Survey (SASS) data, Ingersoll found that new teachers who had pedagogical preparation as well as more clinical practice before they began teaching were more likely to stay in teaching (as cited by Dow & Webb, 2003). Yet, Wilson, Floden, and Ferrini-Mundy (2001) reported that over twenty percent of new teachers in Florida had no student teaching experience, a component of preparation that most novice teachers rate as the most essential.

What effect, if any, does a lack of teacher training and experience have on a teacher's confidence and beliefs about their teaching abilities and effectiveness? The educational theorist, Albert Bandura, has conducted extensive research in this area related to social learning theory and self-efficacy. This study used Bandura's theory of teacher efficacy as its theoretical frame. The conceptual framework constructed in this study was based on the premise that teachers with higher levels of perceived teacher efficacy tend to be more motivated, effective, engaging, persistent, and remain in the profession longer than those with low levels of perceived teacher efficacy.

Teacher efficacy is defined as a self-perceived belief of one's capabilities to bring about desired outcomes, even with students who are unmotivated or present discipline problems (Bandura, 1977). Teacher efficacy has been found to be related to teacher behavior, effort, innovation, planning and organization, persistence, resilience, enthusiasm, willingness to work with difficult students, and commitment to teaching and their career (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Teacher efficacy has implications on learning environment management as well. Teachers who believe strongly in their teaching efficacy tend to rely on persuasory means rather than authoritarian control, and to support development of students' intrinsic interest and academic self-directedness (Bandura, 1997). Miller et al. (1989) found motivated and confident teachers were more effective. Teacher efficacy has also been found to impact student performance. Students achieved more, exhibited greater motivation, and had a higher level of self-efficacy when their teacher possessed a higher level of teacher efficacy (Guskey & Passaro, 1994; Knobloch & Whittington, 2002).

Bandura (1997) also found that teachers' perceptions of the school environment and culture affected their beliefs about their ability to be effective in the classroom. Ashton and Webb found heavy workloads, bureaucratic practices, variable quality of leadership, insufficient resources and pay, lack of advancement opportunities, problematic students, and low occupational status are just some of the common problems faced by all educators (as cited by Knobloch & Whittington, 2002). These challenging school conditions coupled with a lack of confidence may have detrimental effects on a teacher's perceived ability to be effective in the field and may led to the end of a struggling teacher's career. This loss of teaching professionals further compounds the teacher shortage and ultimately provided the impetus for this study.

Purpose/Objectives

The purpose of this study was to describe and compare traditionally and alternatively certified Florida agriculture teachers, and examine the relationship between teaching experience and teacher efficacy. To achieve this purpose, the study had three objectives:

1. To describe traditionally and alternatively certified teachers based on selected demographic characteristics and years of agriculture teaching experience.
2. To compare traditionally and alternatively certified teachers based on their perceptions of teacher efficacy.
3. To examine the relationship between years of agriculture teaching experience and level of perceived teacher efficacy for traditionally and alternatively certified teachers.

Procedures

This descriptive census study utilized a target population of agriculture teachers in their first five years of teaching agriculture (N = 122) in Florida. The accessible population was identified from the 2003-2004 Florida Association of Agricultural Educators Directory (Myers & Dyer, 2003). This group of teachers was selected due to the high attrition rate, nearly 50%, during the first five years of teaching (Ingersoll, 2002). Furthermore, teachers with five years experience or less were selected based upon Miller's et al. (1998) findings that no significant differences in teaching behavior, student output, or attitude existed between traditionally and alternatively prepared teachers after three years in the profession.

The survey instrument was adapted from the Teachers' Sense of Efficacy Scale (TSES) developed by Tschannen-Moran and Woolfolk Hoy (2001) and demographical questions were added for additional analysis. The 12-item TSES asked respondents to rate their beliefs about how well they could perform in various teaching situations using a 5-point Likert-type scale. The scale ranged from "Not at All" (1 point) to "Excellent" (5 points). An expert panel was used to determine the instrument's face and content validity. The instrument was pilot tested with a sample of 10 agriculture teachers from another state in their first five years of teaching. Post hoc reliability analysis of the pilot instrument resulted in a Cronbach's alpha of .90, which is equal to the estimate provided by Tschannen-Moran and Woolfolk Hoy (2001).

Data were collected by a mailed questionnaire using Dillman's (2000) tailored design method consisting of five contacts during the spring semester of the 2003-2004 school year. Completed questionnaires were received from 66 of the 122 teachers in the accessible population for a 54% response rate. Given the response rate, a comparison of the early to late responders was conducted to ensure that results were representative of the target population, as suggested by Lindner, Murphy, and Briers (2001), and Miller and Smith (1983). Results of the comparison yielded no notable differences between early and late responders on age, years of teaching agriculture, and summated mean scores on the TSES.

Descriptive statistics were used to analyze data for Objective 1. Categorical data were reported as frequencies and interval data were reported as means and standard deviations. Objective 2 was accomplished by calculating individuals' summated scores for the TSES

(Clason & Dormody, 1994). Pearson's product moment coefficient of correlation (Ary, Jacobs, & Razavieh, 2002, p.146) was used in Objective 3 to indicate whether a relationship existed between years of teaching experience and teacher efficacy.

For the purposes of this study, a traditionally certified agriculture teacher was operationally defined as a teacher who qualified for certification by completing an undergraduate degree program in Agricultural Education. Teachers who earned their teaching certification through other means were considered to be alternatively certified (Roberts & Dyer, 2003).

Findings

Respondents consisted of 39 alternatively certified teachers and 27 traditionally certified teachers. Alternatively certified teachers were almost evenly split between males (51%) and females, while the traditionally certified teachers were nearly 67% female. As shown in Table 1, both groups were predominately Caucasian. However, alternatively certified teachers did represent a more ethnically diverse group with over 20% being African American, Hispanic/Latino, or other ethnicities. Traditionally certified teachers were nearly all Caucasian (96.3%) with only one respondent reporting Hispanic/Latino.

Table 1
Ethnicity of Traditionally and Alternatively Certified Agriculture Teachers

	Traditionally Certified		**Alternatively Certified**	
Gender	*f*	%	*f*	%
African-American			2	5.1
Caucasian	26	96.3	31	79.5
Hispanic/Latino	1	3.7	4	10.3
Other			2	5.1
Total	27	100.0	39	100.0

On average, alternatively certified teachers were 10 years older than their traditionally certified counterparts (See Table 2). The mean age of traditionally certified teachers was 25 years versus 35 years for the alternatively certified group. Alternatively certified teachers also exhibited a greater range of age (22 to 59 years) compared to traditionally certified teachers who ranged from 22 to 37 years of age. Furthermore, results of the analysis showed greater variability of age in alternatively certified teachers (*SD* = 12.24) when compared to traditionally certified teachers (*SD* = 3.03).

Table 2
Age of Traditionally and Alternatively Certified Agriculture Teachers

	Age				
Certification	*n*	Min	Max	*M*	*SD*
Traditional	27	22	37	25.63	3.03
Alternative	39	22	59	35.46	12.24

In addition to being an older group of individuals, alternatively certified teachers possessed more advanced degrees than the traditionally certified teachers (See Table 3). Over 28% of the alternatively certified teachers had earned Master's or other advanced degrees. Conversely, only 15% of the traditionally certified group had received a Master's degree and no other advanced degrees were reported.

Table 3
Educational Level of Traditionally and Alternatively Certified Agriculture Teachers

	Traditionally Certified		**Alternatively Certified**	
Degree(s)	*F*	%	*f*	%
Bachelors	23	85.2	28	71.8
Masters	4	14.8	8	20.5
Other			3	7.7
Total	27	100.0	39	100.0

Since alternatively certified teachers were operationally defined as those who earned their Bachelor's degree in a subject other than Agricultural Education, the respondents were asked to indicate their undergraduate majors. Table 4 shows that respondents earned degrees in 15 different academic areas. Over half of the alternatively certified teachers received degrees in one of the following three majors: Animal Science, Agricultural Business/Economics, and Environmental Horticulture. Nearly 27% of the alternatively certified teachers reported degrees in non-agricultural fields.

Table 4
Bachelor's Degree Major of Traditionally and Alternatively Certified Agriculture Teachers

Major(s)	*f*	%
Animal Science	11	28.2
Agricultural Business/Economics	7	17.9
Environmental Horticulture	4	10.3
Liberal Studies	2	5.1
Plant Science	2	5.1
Physical Education	2	5.1
Other agricultural majors[a]	2	5.1
Other non-agricultural majors[b]	7	17.9
No-response	2	5.1
Total	39	100.0

[a]Other agricultural majors include: Agricultural Communications and Agricultural Science
[b]Other non-agricultural majors include one respondent each in Engineering, Environmental Science, History, International Studies, Marketing, Medical Science, and Psychology

Table 5 shows differences in traditionally and alternatively certified teachers were also apparent in terms of their years of occupational experience in agriculture. The alternatively certified teachers averaged 7.6 years of agriculturally related experience while traditionally certified teachers had a mean of only one year. Alternatively certified teachers were also found to have a wider range of experience with 0 to 30 years, while traditionally certified teachers ranged from 0 to 7 years. Similar to the findings for age, alternatively certified teachers were found to have greater variability in their years of experience (*SD* = 8.7) in comparison to the traditionally certified group (*SD* = 1.9).

Table 5
Years of Agriculturally Related Occupational Experience of Traditionally and Alternatively Certified Agriculture Teachers

	Occupational Experience				
Certification	*n*	Min	Max	*M*	*SD*
Traditional	27	0	7	1.00	1.86
Alternative	38	0	30	7.63	8.69

An examination of the years of agriculture teaching experience of traditionally and alternatively certified respondents found minimal differences (See Table 6). First year teachers made up the largest proportion of teachers in both groups. Furthermore, approximately 59% of teachers in both groups were first and second year teachers with the remaining proportion being third, fourth, and fifth year teachers. Overall, fifth year teachers were the fewest in number.

Table 6
Years of Agriculture Teaching Experience of Traditionally and Alternatively Certified Agriculture Teachers

	Traditionally Certified		**Alternatively Certified**	
Year	*f*	%	*f*	%
First	12	44.4	15	38.5
Second	4	14.8	8	20.5
Third	6	22.2	8	20.5
Fourth	4	14.8	4	10.3
Fifth	1	3.7	4	10.3

To accomplish the second objective, the summated group means from the TSES (Tschannen-Moran & Woolfolk Hoy, 2001) were compared for traditionally and alternatively certified teachers. Analysis of the data showed there were no notable differences between these two groups (See Table 7). Traditionally certified teachers were found to have a summated mean score of 45.30, while alternatively certified teachers had a summated mean of 45.19. The two groups were found to differ in variance of summated scores with alternatively certified teachers again having greater variability (*SD* = 7.9) than traditionally certified teachers (*SD* = 4.3).

Table 7
Perceived Teacher Efficacy of Traditionally and Alternatively Certified Agriculture Teachers

	Teacher Efficacy				
Certification	*n*	Min[a]	Max[a]	*M*[a]	*SD*
Traditional	27	33	55	45.30	4.26
Alternative	38	29	60	45.19	7.89

[a]Summated score: 12 = lowest possible score … 60 = highest possible score

The final objective of the study was to determine if a relationship existed between years of agriculture teaching experience and perceived teacher efficacy. Results of the correlation matrix yielded a coefficient of .133 when all respondents were included in the analysis. When respondents were divided into their designated certification groups, a slight difference was found. The relationship between years of teaching experience and teacher efficacy was slightly higher for traditionally certified teachers (r = .224) than for the alternatively certified teachers (r = .105).

Conclusions

Based on the objectives and results of this study, several conclusions can be drawn. First, over half of the teachers in this study received their certification through alternative means. This proportion is much greater than the national average of 13% reported by Camp et al. (2001). These results were consistent with the findings of Roberts and Dyer (2003) who in a similar sample found that approximately half of the teachers in Florida were alternatively certified.

The first objective sought to describe traditionally and alternatively certified teachers in terms of their years of agriculture teaching experience and selected demographic characteristics. Alternatively and traditionally certified teachers were found to differ in the proportion of male and female teachers in each group. Teachers receiving their certification through traditional means were predominately female while alternatively certified teachers were nearly equal in gender numbers. Although both groups of teachers were primarily Caucasian, a greater number of minorities were observed in the alternatively certified group. When compared by their mean age, alternatively certified teachers were found to be 10 years older than their counterparts. The difference in age was also reflected in the years of occupational experience possessed by teachers. The younger group of traditionally certified teachers had little to no occupational experience in agriculture, while alternatively certified teachers brought an average of seven years of occupational experience into the classroom. The additional age and experience of the alternatively certified teachers may account for their higher than expected efficacy beliefs. The literature led the researchers to anticipate that the experience gained through a university teacher preparation program would have caused traditionally certified teachers to have greater self-efficacy than their counterparts who received no such training. This may be true, however it appears that the additional life and occupational experience of the alternatively certified group may have impacted their level of efficacy. This conclusion is consistent with Bandura's (1986) belief that learning experiences shape an individual's perceptions of self-efficacy.

Objective 2 compared traditionally and alternatively certified teachers' perceptions of self-efficacy related to teaching. Data analysis resulted in nearly equal summated mean scores for the two groups of teachers. Therefore, traditional and alternatively certified agriculture teachers were not distinguishable when compared on their perceived teacher efficacy. Alternatively certified teachers' lack of formal instruction in agricultural education, teaching methods, and pedagogy did not manifest into lower feelings of teacher efficacy. This leads to the conclusion that alternatively and traditionally certified teachers had similar beliefs in their ability to teach effectively.

The final objective examined years of agriculture teaching experience and teacher efficacy. The findings for both traditionally and alternatively certified teacher groups showed that these variables shared only a low positive association (Miller, 1998). This conclusion is contradictory to Miller et al. (1989) who found that effective teachers possessed more teaching experience, however the limited range of teaching experience of the population may have contributed to this finding.

Implications and Recommendations

Although no notable differences were revealed in teacher efficacy between traditionally and alternatively certified teachers, the results did show that both groups had high efficacy scores considering that nearly 80% of respondents were in their first three years of teaching. Over 50% of new teachers in Florida are alternatively certified and feel highly efficacious about their teaching. Since these teachers do not have a connection with the University's Agricultural Education faculty, this has strong implications for their participation in professional development activities. Do these alternatively certified teachers feel the need for further education and professional development specific to agricultural education? These findings necessitate future studies to determine whether other groups of beginning teachers are equally efficacious and to determine alternatively certified teachers' willingness and perceived need to participate in the professional development activities provided by university teacher educators.

Traditionally certified teachers tend to be younger and enter the profession with little practical agricultural experience. Conversely, the alternatively certified teachers are typically those who pursue agriculture teaching as a second career choice. The additional life, education, and occupational experience possessed by alternatively certified teachers may have provided them with greater confidence in their abilities to teach agriculture. This conclusion has implications not only for alternative certification programs, but also for traditional teacher preparation programs as well. The importance of advanced degrees and occupational experience should not be overlooked as they may contribute to the efficacy beliefs of all agriculture teachers and deserve the attention of researchers in future studies. Additionally, the age and experience differences found in this study also indicate the potential for an additional option within the University's teacher preparation program that would allow those who wish to pursue teaching as a second career to earn a Master's degree and teaching certification simultaneously.

The demographical differences between these two groups raised some interesting questions. For instance, why are more females choosing the traditional teacher preparation route than males? This appears to be a trend not only in teacher education programs but also in secondary agriculture programs as well. Additionally, why do minority teachers tend to enter agriculture teaching through alternative certification programs? The gender and ethnicity distribution results of this study indicate that more men and minorities are interested in teaching agriculture, but they are not attracted to the university's undergraduate program. Further research is needed to investigate preservice teacher recruitment efforts and how to encourage more men and minority students to enter the agriculture teacher preparation program.

Given that the comparison of teacher efficacy between traditionally and alternatively certified teachers didn't reveal any differences, one would assume that these two groups were equally confident in their teaching ability. However, given the inconclusive nature of the literature and the limited amount of research involving this population of teachers the researchers believe more studies are needed to understand the differences between these two groups of teachers. For instance, do traditionally and alternatively certified teachers have similar perceptions of their job responsibilities and expectations of performance? Roberts and Dyer (2003) stated that alternatively certified teachers might not recognize their own deficiencies since they received no formal training. Traditional teachers may look at their teaching performance more critically due to their pedagogical knowledge, while alternatively certified teachers base their feelings of efficacy on their subject matter knowledge and experience. Is it possible that these two groups of teachers have differing views of what is expected of them as agriculture teachers? This may be an indication of the type of curriculum being taught by alternatively certified teachers. Are they teaching the state approved curriculum or are they teaching what they know based on their experience? This warrants future studies to examine the teaching practices and curriculum delivered by alternatively certified teachers to determine what causes their high level of teacher efficacy and if they view their job expectations in a similar manner as traditionally certified teachers.

In this age of school accountability, people entering the agriculture teaching profession from industry must be prepared to teach the agricultural curriculum and the requisite math, science, and reading skills needed by all students. Without formal preparation in pedagogy, do alternatively certified teachers have the necessary teaching skills needed to do so effectively? This has serious implications for student performance at a time when all elective programs are under a magnifying glass. Future studies should investigate whether students of alternatively certified agriculture teachers perform as well as students of traditionally certified teachers on standardized assessments.

This study examined traditionally and alternatively certified agriculture teachers in Florida. Findings determined that these two groups had similar efficacy beliefs, but were different in terms of their age, educational level, and occupational experience. Recommendations for future research called for the replication of the study with other beginning teachers, increased recruitment of underrepresented populations into teacher preparation programs, and investigation of the curriculum being delivered and teaching practices used by traditionally and alternatively certified teachers as they may impact teachers' perceptions of efficacy and student achievement.

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THE RELATIONSHIPS BETWEEN SELECTED DEMOGRAPHIC FACTORS AND THE LEVEL OF JOB SATISFACTION OF EXTENSION AGENTS

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Abstract

The purpose of this study was to determine what demographic factors were related to the level of job satisfaction of Extension agents. The study followed a descriptive correlational design. A modified version of the Job Diagnostic Survey developed by Hackman and Oldham (1980) was sent to 195 Extension agents. Based on 143 usable responses, significant relationships existed between the job satisfaction constructs and the demographic factors of gender and race. When considering Extension agents' current position, a significant difference was found between area agents and 4-H agents regarding how each group rated satisfaction with co-worker relations. Significant relationships were determined at the p < .05 level.

Introduction

Hoppock (1935) defined job satisfaction as "any combination of psychological, physiological, and environmental circumstances that causes a person truthfully to say, 'I am satisfied with my job'" (p. 47). Employees may be satisfied with some aspects of their jobs, while being dissatisfied with others. It is assumed that employees are able to balance the specific satisfactions against the specific dissatisfactions and arrive at a composite satisfaction with the job as a whole (Hoppock, 1935). According to Poling (1990), the best predictor of job satisfaction is when the employees' personal values match those of the organization.

When considering job satisfaction, demographic variables should be considered to thoroughly understand the possible factors that lead to job satisfaction and dissatisfaction. Herzberg, Mausner, Peterson, and Capwell (1957) identified several characteristics of satisfied/dissatisfied workers. They indicated that morale is high when people first start their jobs. Morale decreases during the next few years and remains at a relatively low level until workers are in their late twenties or early thirties. At this time, job satisfaction levels begin to rise and continue to rise through the remainder of the workers' careers. The same trend is found in regard to a worker's length of service. Workers begin with high morale, which drops during the first year and remains low for a number of years. Then as length of service increases, job satisfaction levels tend to rise.

Concerning gender, there are no simple conclusions about the differences between males and females and their job satisfaction levels. Some studies reviewed by Herzberg et al. (1957) indicate that males are more satisfied with their jobs, while others indicate that females are more satisfied. Educational level is not clear either. Furthermore, these studies showed that workers with more education have a higher job satisfaction level, while other studies indicate that workers with more education have a lower job satisfaction level. Other studies showed no relationship between the two. Herzberg et al. (1957) suggested that a clear conclusion cannot be drawn concerning job satisfaction and its relationship to marital status, number of dependents, number of previous occupations, or ethnicity.

In a study of agricultural education teachers in Ohio, Cano and Miller (1992b) found that the teacher's age, years in current position, total years teaching, and degree status were not significantly related to overall job satisfaction. In general, both males and females were equally satisfied with their jobs. These findings are similar to a later study of the same nature by Castillo, Conklin, and Cano (1999). Therefore, over an approximate ten year period, agriculture teachers' selected demographic characteristics were not significantly related to their overall level of job satisfaction. The findings from these two studies (Cano & Miller, 1992b; Castillo et al., 1999) implied that older or younger teachers were not necessarily more or less satisfied with their jobs. Additionally, the longer a teacher remained in the profession the less his or her overall job satisfaction level was affected (Castillo & Cano, 1999). When the same demographic variables were examined in yet another study that explored six different classifications of agriculture teachers (Cano & Miller, 1992a), it was found that overall job satisfaction was not significantly related to any of the demographic variables.

Although the Ohio researchers' findings are consistent, their findings on age, total years teaching, and degree status are contrary to the findings of Berns (1989) and Grady (1985). Berns (1989) found that as the age of the teacher increased, so did his or her overall job satisfaction level. Grady (1985) found that as the number of years of teaching experience increased, overall job satisfaction increased as well. Berns (1989) discovered that a teacher's educational level also affected his or her overall job satisfaction level. A teacher with a master's degree was more satisfied with his or her teaching position than a teacher with only a bachelor's degree. Because of these inconsistencies in the literature, perhaps findings on the relationship of demographic variables to overall job satisfaction should only be applied to the area in which the study was conducted.

Research has been conducted on whether Extension faculty's level of job satisfaction was related to age, years of experience, educational level, and marital status (Andrews, 1990; Bowen, Radhakrishna, & Keyser, 1994; Fetsch & Kennington, 1997; Griffin, 1984; Nestor & Leary, 2000). Regarding age, intrinsic job satisfaction was higher for those in the age groups of 23 to 33 and 46 to 50 (Nestor & Leary, 2000). This is consistent with the findings of Griffin (1984), who found in a study of Extension home economists that age was related to job satisfaction. The findings of Bowen et al. (1994) indicated that age was related to job satisfaction, since they found in a study of 4-H agents that those who were older had a higher level of job satisfaction. On the other hand, Andrews (1990) found no relationship between age and the job satisfaction levels of Extension agricultural agents.

Nestor and Leary (2000) did find that as one's years of experience increased as an Extension faculty member, his or her intrinsic and overall job satisfaction increased as well. Bowen et al. (1994) also found this to be true for 4-H agents, while Fetsch and Kennington (1997) found it to be true for all Extension agents in their study. In contrast, Griffin (1984) and Andrews (1990) both found no relationship between job satisfaction and years of experience.

Concerning the educational level of Extension faculty, Andrews (1990) discovered a relationship between educational level and job satisfaction. However, Bowen et al. (1994) and Griffin (1984) found no such relationship.

Marital status was related to the job satisfaction levels of 4-H agents as indicated by Bowen et al. (1994) who found in a study that married 4-H agents were more satisfied with their jobs than those who were single. Fetsch and Kennington (1997) also found a relationship between marital status and job satisfaction levels. They found both divorced and married agents to be more satisfied with their jobs than agents who were never married, remarried, or widowed.

Several studies involving Extension agents regarding their job satisfaction levels and gender have been conducted (Bowen et al., 1994; Nestor & Leary, 2000; Riggs & Beus, 1993). However, the literature is divergent, illustrating that some studies indicate that females have higher levels of job satisfaction, while other studies indicate that males do (Bowen et al., 1994; Riggs & Beus, 1993). There are even some studies that indicate that there is no relationship between gender and job satisfaction levels (Nestor & Leary, 2000).

Whereas Nestor and Leary (2000) found no relationship between gender and job satisfaction, Riggs and Beus (1993) found that as the number of areas of responsibility increased for female agents, job satisfaction increased as well. The opposite was true for males. When their areas of responsibility increased, their job satisfaction levels decreased. However, males with more areas of responsibility were more satisfied with their colleagues than were female agents. It was also found that both male and female agents alike who had fewer areas of responsibility and fewer children living at home were more satisfied. Bowen et al. (1994) as well found a relationship between job satisfaction and gender. They discovered that female 4-H agents were more satisfied with their jobs than male agents.

Theoretical Framework

Hackman and Oldham's (1976) job characteristics theory describes the relationship between job characteristics and individual response to work. This theory is probably the most well-known and widely discussed effort to explain the relationship of job characteristics to job satisfaction. The job characteristics theory was originally tested with the intentions of diagnosing jobs to determine if and how they should be redesigned to improve employee motivation and productivity and then later to be used to evaluate the effects of job changes on employees. At the most basic level, five core job characteristics lead to a number of personal and work outcomes that are beneficial to the individual (Hackman & Oldham, 1975; 1976).

A job characteristic is an attribute of a job that creates conditions for high work motivation, satisfaction, and performance (Hackman & Oldham, 1980). According to a job characteristics theory proposed by Turner and Lawrence (1965), employers should build into employees' jobs certain characteristics that create satisfying conditions. Hackman and Oldham (1980) revised this theory and proposed five core job characteristics that should be included in any job. These characteristics include skill variety, task identity, task significance, autonomy, and feedback. However, because people respond differently to the same job, employers must take into consideration both job characteristics and the work context of the job itself when redesigning work for their employees.

Hackman and Oldham (1980) also defined the four personal and work outcomes of the job characteristics theory. These outcomes include internal work motivation, growth satisfaction, general satisfaction, and work effectiveness. Internal work motivation indicates an employee's satisfaction when performing well on the job because it is rewarding and satisfying to do so, thus serving as an incentive for continuing to do well. Growth satisfaction indicates employee satisfaction when employees have enriched opportunities for personal learning and growth at work. General satisfaction indicates employee satisfaction when employees indicate how satisfied they are with their jobs and how frequently they think of quitting their jobs. These three affective outcomes combine to form the personal satisfaction constructs. Finally, work effectiveness indicates an employee's satisfaction in both the quality and quantity of goods or services produced (Hackman & Oldham, 1974; 1980).

How satisfied individuals are with certain aspects of their work context may affect their willingness to respond positively to enriched work. Those who are relatively satisfied with job security, pay, co-worker relations, and supervision tend to respond more positively to jobs rating high on the job characteristics, thus having a higher level of context satisfaction. These four aspects of work context combine to form the context satisfaction constructs (Hackman & Oldham, 1980).

At the time of this study, Mississippi's Extension Service was two years removed from restructuring. Prior to reorganization, there was no evidence of Extension agents' job satisfaction. Although agents appeared to be satisfied after being reassigned to their new positions, there was no evidence of studies examining Extension agents' level of job satisfaction as it related to selected demographic factors following organizational restructuring in 2002. Therefore, an assessment of the relationship between selected demographic factors and Extension agents' current level of job satisfaction was warranted.

Purpose and Objectives

The purpose of this study was to determine what demographic factors were related to the level of job satisfaction of Extension agents. The specific demographic factors addressed in this study were:

- Gender
- Race
- Age
- Marital status
- Education
- Previous position(s) with the Extension Service
- Current Extension Service position

Methods and Procedures

Population

The population for this descriptive correlational study was all Extension agents employed by the Extension Service in Mississippi as of May 1, 2004 (N = 195). This included area agents, county directors, and 4-H agents. All 195 were included in the study.

Instrumentation

Extension agents' level of job satisfaction was obtained utilizing a modified version of the Job Diagnostic Survey developed by Hackman and Oldham (1980). However, the Job Diagnostic Survey was modified such that only three of its seven sections were used in this study. An additional section containing 10 questions created by the researcher was added to the end of the questionnaire to collect selected demographic characteristics of the participants.

Statements in two of the sections were rated on a 7-point rating scale ranging from strongly disagree to strongly agree. These two sections were used to measure two (internal work motivation and general satisfaction) of the seven aspects of job satisfaction, also called job satisfaction constructs. Items in the third section were rated on a 7-point scale ranging from very dissatisfied to very satisfied. This section yielded scores for the remaining five job satisfaction constructs (growth satisfaction, satisfaction with job security, satisfaction with pay, satisfaction with co-worker relations, and satisfaction with supervision) (Hackman & Oldham, 1980). The last section consisted of questions that asked the participants pertinent demographic information.

Scale scores for the job satisfaction constructs were computed for each agent utilizing the scoring key provided by Hackman and Oldham (1980). Upon calculating scores for the seven job satisfaction constructs, the first three, internal work motivation, growth satisfaction, and general satisfaction, were categorized as personal satisfaction. The last four, satisfaction with job security, pay, co-worker relations, and supervision, were categorized as context satisfaction (Hackman & Oldham, 1980).

Reliability and Validity

Hackman and Oldham (1974) established internal consistency reliabilities of each of the scales measured by the Job Diagnostic Survey. Oldham, Hackman, and Pearce (1976) later reported reliabilities for two job satisfaction scales not addressed in the initial study, satisfaction with job security and satisfaction with pay. Reliability coefficients for the job satisfaction constructs ranged from .56 (satisfaction with co-worker relations) to .84 (growth satisfaction) (Hackman & Oldham, 1974; 1975).

The median of the correlations between the items composing a given scale and all the other items that are scored on different scales of the same general type, often called off-diagonal correlations, provide one indication of the discriminant validity of the items included in the Job Diagnostic Survey. For the job satisfaction constructs, the median off-diagonal correlations ranged from .23 (satisfaction with co-worker relations) to .28 (growth satisfaction) (Hackman & Oldham, 1974).

Data Collection

Data collection was accomplished through the use of an electronic survey through SurveyMonkey.com. Prior to data collection, the director of the Extension Service sent an email to all agents notifying them that they would be asked to participate in the study. The email further stated his support for the study and encouraged agents to participate. The initial email from the researcher asking agents to participate in the study was sent the next day. The message included a link to the survey as well as an individual code number. A week later, a second email was sent to those agents who had not responded. A third and final email was sent a week after the second email to the remaining agents who had not responded. The two follow-up email messages also included the link to the survey and the individual code numbers.

Of the 195 agents invited to participate in the study, 168 responded to the survey for an overall response rate of 86%. Due to incomplete data or to participants choosing not to participate, 143 surveys were usable, making the final usable response rate 73%.

Those not responding to the second follow-up email message were declared non-respondents. To handle non-response error, data from those who responded to the initial email message were compared with data from those who responded to either the first or second follow-up email messages. Responses that were collected following both follow-up email messages were used because less than 30 participants responded to the second follow-up email message. According to Linder, Murphy, and Briers (2001), comparing early respondents to late respondents is an acceptable method for addressing non-response error as a threat to external validity. After analyzing the data of early respondents and late respondents, no significant differences were noted.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS® Version 11.5 for Windows). Descriptive statistics, including means and standard deviations, were used to summarize the data. Frequencies and percentages were reported for the demographic data. Means and standard deviations were computed for the job satisfaction constructs. Point-biserial correlation coefficients (r_{pb}) were calculated to determine the relationships between the job satisfaction constructs and gender, race, marital status, and whether or not the participant had held a previous position with the Extension Service prior to his or her current position. The rank-biserial correlation coefficient (r_b) was calculated to determine the relationships between the job satisfaction constructs and age, while the Spearman's rho correlation coefficient (r_s) was calculated to determine the relationships between the job satisfaction constructs and education. Significant relationships were determined with an a priori alpha level of .05. To describe the strength of the relationships calculated in the study, Davis' conventions were utilized (Davis, 1971).

Results

Population Description

The largest percentage (41.2%) of the participants identified themselves as county directors, while 32.2% were classified as area agents. 4-H agents accounted for 26.6% of the participants.

Gender

As reported in Table 1, low significant relationships were found between gender and three of the job satisfaction constructs, growth satisfaction (r_{pb} = .22), satisfaction with job security (r_{pb} = .19), and satisfaction with pay (r_{pb} = .23). After examining the scatter plots for the relationships between gender and these three constructs, it was found that females rated growth satisfaction, satisfaction with job security, and satisfaction with pay higher than males. All other relationships were low as well except for the one between gender and satisfaction with co-worker relations (r_{pb} = .08), which was negligible.

Race

Low significant relationships were found between race and two of the job satisfaction constructs, general satisfaction (r_{pb} = .22) and satisfaction with supervision (r_{pb} = .24) (Table 1). After examining the scatter plots for the relationships between race and these two constructs, it was found that Caucasians rated general satisfaction and satisfaction with supervision lower than other races. Negligible relationships were found between race and internal work motivation (r_{pb} = .03) and between race and satisfaction with pay (r_{pb} = .09).

Table 1
The Relationships Between the Job Satisfaction Constructs and Gender and Race for All Agents (N = 143)

	r_{bp}	
Job Satisfaction Construct	Gender[a]	Race[b]
Personal Satisfaction Construct		
Internal Work Motivation	.15	.03
Growth Satisfaction	.22*	.16
General Satisfaction	.10	.22*
Context Satisfaction Construct		
Job Security	.19*	.11
Pay	.23*	.09
Co-Worker Relations	.08	.10
Supervision	.16	.24*

[a] 1 = Female; 2 = Male. [b] 1 = Other (African-American, Asian-American, American, or Irish-American); 2 = Caucasian.
*p < .05.

Age

No significant relationships were found between age and the job satisfaction constructs. Satisfaction with job security (r_b = - .12) and satisfaction with pay (r_b = .10) were the only two job satisfaction constructs having low relationships with age. All other relationships were negligible.

Marital Status

No significant relationships were found between marital status and the job satisfaction constructs. Only two low relationships were found. These relationships were found between marital status and internal work motivation (r_{pb} = .10) and between marital status and satisfaction with pay (r_{pb} = .11). All other relationships were negligible.

Education

Again, no significant relationships were found between the demographic factor and the job satisfaction constructs. The only low relationship found was between education and satisfaction with pay (r_s = .14). All other relationships were negligible.

Held a Previous Position with the Extension Service

No significant relationships were found between whether or not a participant had held a previous position with the Extension Service and the job satisfaction constructs. All relationships were negligible, except for the low relationship with satisfaction with supervision (r_{pb} = .10).

Current Extension Service Position

Job satisfaction means for all agents ranged from 3.70 to 6.60 (Table 2). 4-H agents rated the job satisfaction construct of satisfaction with co-worker relations the highest (*M* = 6.60), while county directors rated the job satisfaction construct of satisfaction with pay the lowest (*M* = 3.70). The means among the agent groups were alike for six of the seven job satisfaction constructs. A significant difference was found between area agents and 4-H agents (Scheffé Mean Difference = .3429, *p* = .032) regarding how each group rated satisfaction with co-worker relations. Area agents rated this construct significantly lower than 4-H agents.

Table 2
Means of the Job Satisfaction Constructs for All Agents (N = 143)

	M		
Job Satisfaction Construct	Area Agents	County Directors	4-H Agents
Personal Satisfaction Construct			
Internal Work Motivation	5.51	5.60	5.57
Growth Satisfaction	5.92	6.03	6.18
General Satisfaction	5.20	5.04	5.17
Context Satisfaction Construct			
Job Security	5.30	5.39	5.71
Pay	3.76	3.70	3.83
Co-Worker Relations*	6.25	6.53	6.60
Supervision	4.80	5.21	5.22

Note. Means of two job satisfaction constructs (internal work motivation and general satisfaction) were derived from a combination of items contained in two of the sections of the Job Diagnostic Survey. Means of the remaining five job satisfaction constructs (growth satisfaction, satisfaction with job security, satisfaction with pay, satisfaction with co-worker relations, and satisfaction with supervision) were derived from items contained in another section of the Job Diagnostic Survey. Area Agents differed from 4-H Agents. County Directors did not differ from the other two groups.
*$p < .05$.

Conclusions

For Extension agents, low relationships were observed between gender and the job satisfaction constructs of growth satisfaction, satisfaction with job security, and satisfaction with pay. Females rated all three of these constructs higher than males, indicating a higher level of satisfaction with personal learning and growth opportunities at work, job security, and compensation. Previous studies have shown similar findings (Bowen et al., 1994; Riggs & Beus, 1993). However, even though the literature indicates a relationship between gender and job satisfaction, some studies are inconclusive regarding whether males or females are more satisfied (Herzberg et al., 1957). In contrast, other studies have shown that gender is not related to job satisfaction (Cano & Miller, 1992a; Cano & Miller, 1992b; Castillo & Cano, 1999; Castillo et al., 1999; Nestor & Leary, 2000).

Age was not related to any of the job satisfaction constructs for Extension agents. This conclusion is consistent with other studies (Andrews, 1990; Cano & Miller, 1992a; Cano & Miller, 1992b; Castillo & Cano, 1999; Castillo et al., 1999). However, several studies have shown a relationship between age and job satisfaction, indicating that older workers are more satisfied with their jobs than younger workers (Berns, 1989; Bowen et al., 1994; Griffin, 1984; Herzberg et al., 1957; Nestor & Leary, 2000).

For Extension agents, race had low relationships with the job satisfaction constructs of general satisfaction and satisfaction with supervision. Caucasians rated both of these constructs lower than other races, indicating a lower level of satisfaction with their jobs in general and with the supervision that they receive. However, some studies have shown that race and job satisfaction are not related (Herzberg et al., 1957).

Marital status was not related to any of the job satisfaction constructs for Extension agents. This conclusion is consistent with other studies (Herzberg et al., 1957). However, several studies have shown a relationship between marital status and job satisfaction, indicating that married or divorced agents are more satisfied with their jobs than remarried, never married, or widowed agents (Bowen et al., 1994; Fetsch & Kennington, 1997).

Education was not related to any of the job satisfaction constructs for Extension agents. Other researchers have found this same conclusion (Bowen et al., 1994; Cano & Miller, 1992a; Cano & Miller, 1992b; Castillo & Cano, 1999; Castillo et al., 1999; Griffin, 1984; Herzberg et al., 1957). However, the literature does indicate a relationship between education and job satisfaction, even though studies are inconclusive regarding whether or not workers increase or decrease their job satisfaction when they increase their educational level (Herzberg et al., 1957). Even so, some studies do indicate that increasing one's educational level increases his or her level of job satisfaction (Andrews, 1990; Berns, 1989).

Comparing the means of the job satisfaction constructs for the three groups of Extension agents revealed that for the most part, there was no difference among the three groups regarding how satisfied each group was with the seven job satisfaction constructs. Two groups differed only on one of the seven job satisfaction constructs. A significant difference was found between area agents and 4-H agents regarding how satisfied each group was with their co-worker relations. Area agents rated this construct lower than 4-H agents, indicating a lower level of satisfaction with their relationships with their co-workers. However, having held a previous position with the Extension Service was not related to any of the job satisfaction constructs for Extension agents.

Recommendations

Results of this study should be presented to Extension administrators to make them aware of which demographic factors were related the level of job satisfaction of Extension agents. Extension administrators should then design inservices and trainings to help male Extension agents increase their level of satisfaction with personal learning and growth opportunities at work, job security, and compensation. They should also address the need for Caucasian Extension agents to increase their level of satisfaction with their jobs in general and with the supervision that they receive. Since area agents indicated a lower level of satisfaction with their relationships with their co-workers as compared to 4-H agents, Extension administrators should adjust area agents' job duties so that they are able to build relationships with their co-workers.

This study should be replicated in three to five years to determine if the level of job satisfaction of Extension agents is related to the same demographic factors, to other demographic factors, or to none of the demographic factors. Finally, Extension Services in other states should replicate this study to make administrators aware of possible inservice needs among their employees.

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VOLUNTEER ADMINISTRATION LEADERSHIP PROFICIENCY AND LEADERSHIP STYLES: PERCEPTIONS OF SOUTHERN REGION 4-H COUNTY FACULTY

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Abstract

Volunteer administration leadership is an important component of any successful 4-H program. Proficiency in competencies associated with volunteer administration can prove to be one's greatest asset in his/her ability to successfully develop the leadership of youth. With that, leadership style is also an important consideration because it provides a means for working with individuals and reaching programmatic goals.

The purpose of this study was to determine the perceived proficiency of 4-H faculty in the southern region in seven competencies associated with volunteer administration leadership: These were measured using the Volunteer Administration Leadership Competency Instrument (VALCI). Leadership style was also determined using the Multifactor Leadership Questionnaire (MLQ), which measures three dimensions of leadership style, transformational, transactional and laissez faire.

Respondents were found to be of average proficiency in volunteer administration leadership competence, scoring M= 70.96, SD=9.60 out of 100. However, were far more proficient in the individual competencies of personal skills M=84.75, SD=10.07, and organizational culture, M=75.08, SD=15.05. Respondents also believed that their ability to work with people was the most important skill related to volunteer administration, M=94.02, SD=6.26 and their ability to address positions and relationships within the organization second, M=88.06, SD=8.87. However, their greatest weaknesses were found to be accountability, M-difference=20.90 and management, M-difference=20.07.

4-H county faculty in the southern region use transformational leadership most frequently, M=2.82, SD=.47 followed by their use of transactional leadership, M=1.79, SD=.41 and laissez faire, M=.76, SD=.45. According to Bass and Avolio (2000b) this proportion of scores leads to a balance of leadership, with transformational leadership being the most active and effective style of the three.

Implications are that 4-H county faculty in the southern region could use additional professional development opportunities addressing skills related to accountability and management. Additionally, these faculty members can continue to better their skills related to transformational leadership, ensuring consistent practice across the region.

Introduction

There were 7,090,920 youth participating in 4-H programs in 2003 (The National 4-H Headquarters, 2004). The National Association for Extension 4-H Agents (NAE4-HA) (2004) reported there approximately 3600 youth development professionals as members. These two figures make the youth to county 4-H faculty member 1:1970. However, the National 4-H Headquarters (2004) reported 449,966 volunteers last year. This decreased the youth to adult ratio to 1:16. These figures validate the importance of volunteers to the Cooperative Extension Service (CES) program area of 4-H. The most effective way to ensure that volunteers continue to contribute to the 4-H mission is to ensure volunteer programs are administered well.

Today, the number of volunteer administration models has grown, with four from CES personnel (Boyce, 1971; Culp, Deppe, Castillo & Wells, 1998; Kwarteng, Smith & Miller, 1987; Penrod, 1991). Although extension has been in the business of volunteer administration for 30 years, and some would argue since the establishment of the Smith Lever Act of 1914 (Wessel & Wessel, 1982), the profession of volunteer administration is only 20 years old (Deppe & Culp. 2001).

As the field of volunteer administration continues to develop and becomes the focus of research (Culp, 2001), extension faculty, especially those identified as having a high level of interaction with volunteers, are a population that has direct benefit from research initiatives. Likewise, the changing role of extension programming in becoming more responsive to clientele provides a need for further research addressing county faculty leadership style.

Theoretical Framework

Volunteer Administration

With organizations like the Association for Volunteer Administration (AVA) pushing the profession forward there has continued to be advancements in the methodologies of volunteer administration (VA) (Stedman & Rudd, 2004). The establishment of professional competencies in volunteer administrators has encouraged many professionals to seek new and challenging educational opportunities (Association for Volunteer Administration, 2001). The AVA has identified five core competencies of volunteer administration which are (a) professional principles, (b) leadership, (c) management, (d) planning, and (e) human resource management (Association for Volunteer Administration, 2004). Competency-based criteria are an important step in developing a profession and Boyd (2003) identified the competencies that professionals in volunteer administration would need in the coming decade as: (a) organizational leadership, (b) systems leadership, (c) organizational culture, (d) personal skills, and (e) management skills.

In an effort to address the creation of a holistic model of education for volunteer administrators, Stedman and Rudd (2004) developed the theoretical dimension of the discipline. Within that model seven key competencies were identified combining the work of the AVA (2001) and Boyd (2003). These competencies contributed to the theoretical dimensions and also contributed to the development of the Volunteer Administration Leadership Competency Instrument (VALCI) Stedman (2004).

Stedman and Rudd (2004b) operationalized these concepts as: (a) *Organizational Leadership*: leadership taking place in the context of the organization includes planning and operation at the program level, (b) *Systems Leadership*: leadership involving the expressed knowledge of one's discipline, (c) *Accountability*: knowledge and practice of skills addressing the planning, operation, and evaluation of a volunteer program, (d) *Management Skills*:

knowledge and skills addressing the day-to-day operations of a volunteer program, (e) *Personal Skills*: knowledge and skills addressing effective communication and relationship building in volunteer programs, (f) *Organizational Culture*: knowledge and skills addressing positions and relationships within a volunteer organization, and (g) *Commitment to the Profession*: knowledge and skills addressing individual commitment to the field of volunteer administration.

Within the CES there has been research examining the needs and desires of extension volunteers from identifying their key characteristics (Culp, 1996), motivation and retention needs (Culp, 1997), advisory board representation (Ingram & Nyangara, 1997), and motivation and recognition needs (Fritz, Barbuto, Marx & Etling, 2000). Additionally, researchers have examined extension faculty's perceptions of volunteer administration models across the U.S. (Culp & Deppe, 2001; Culp & Kohlhagen, 2004; Hange, Seevers, & VanLeeuwen, 2002). Key areas of volunteer administration, including needs assessments, use of job descriptions, resource location and recruitment, were determined to be areas of additional education (Culp, 2001). Hange, Seevers, and VanLeeuwen (2002) were able to show that differences between perception and importance in nine competency areas of volunteer administration existed. This is consistent with King (1997) who indicated county agents' perceptions of competence and relative importance of competence would differ.

Leadership Styles

The model of Full Range Leadership guided the researchers in evaluating the leadership styles of 4-H county faculty in the southern region (Bass & Avolio, 2000b). The notion of Full range leadership is there are three styles of leadership guiding leader behaviors; transformational, transactional and laissez faire (Bass & Avolio, 2000b). Transformational leadership has been identified as the most effective and active style of leadership, while transactional, considered less active and less effective, and laissez faire, the least active and effective follow. Bass (1985) developed conceptual models of both transactional and transformational leadership, which were originally derived from Burns' (1978) work.

Bass and Avolio (2000a) developed the Multifactor Leadership Questionnaire (MLQ) which measures the three leadership styles based on affiliated behaviors. Transformational leadership has four defining behaviors: a) idealized influence (attributed and behavior), b) intellectual stimulation, c) inspirational motivation and d) individualized consideration. Likewise, transactional leadership behaviors include a) contingent reward and b) management-by-exception (active and passive). The MLQ measures laissez faire leadership on a single dimension.

Bass and Avolio (2000b) operationalized transformational leadership behaviors as follows: *Idealized Influence*: leaders display conviction; emphasize trust; take stands on difficult issues; present their most important values; and emphasize the importance of purpose, commitment, and the ethical consequences of decision. Such leaders are admired as role models; they generate pride, loyalty, confidence, and alignment around a shared purpose. *Inspirational Motivation*: leaders articulate an appealing vision of the future, challenge followers with high standards, talk optimistically and with enthusiasm, and provide encouragement and meaning for what needs to be done. *Intellectual Stimulation*: Leaders question old assumptions, traditions, and beliefs; stimulate in others new perspectives and ways of doing things; and encourage the expression of ideas and reasons. *Individualized Consideration*: Leaders deal with others as individuals; consider their individual needs, abilities and aspirations; listen attentively; further their development; advise; and coach.

Transactional leadership was operationalized as: *Contingent Reward*: leaders engage in a constructive path-goal transaction of reward for performance. They clarify expectations, exchange promises and resources, arrange mutually satisfactory agreements, negotiate for resources, exchange assistance for effort, and provide commendations for successful follower performance. *Management-by-Exception*: Active—leaders monitor followers' performance and take corrective action if deviations from standards occur. They enforce rules to avoid mistakes. Passive—leaders fail to intervene until problems become serious. They wait to take action until mistakes are brought to their attention.

Laissez faire leadership was defined as a non-leadership component—leaders avoid accepting their responsibilities, are absent when needed, fail to follow up requests for assistance, and resist expressing their views on important issues.

These operationalizations provided the researchers the ability to objectively identify leadership behaviors consistently among participants, as well as determine leadership style based on MLQ scores. Within the CES, research aimed at identifying leadership style of county faculty has become of interest due to the changing goals facing extension programs (Woodrum & Safrit, 2003). With that, measurement instruments like the Leadership Practices Inventory (LPI) (Kouzes & Posner, 1997) and the Multifactor Leadership Questionnaire (MLQ) (Bass & Avolio, 2000a) have proved to be valuable tools in county faculty leadership development (Rudd, 2000; Woodrum & Safrit, 2003).

The theoretical framework of leadership (Bass & Avolio, 2000a) combined with the theoretical framework of volunteer administration (Stedman & Rudd, 2004a) provided a sound basis for measuring and interpreting leadership behaviors and style, as well as volunteer administration proficiency and importance of 4-H county faculty.

Purpose and Objectives

The purpose of this study was to establish baseline data related to southern region 4-H county faculty leadership of volunteer programs.

Three objectives guided this study:

1. Determine selected demographics of southern region 4-H county faculty,
2. Describe southern region 4-H county faculty's perceived proficiency in and perceived importance of in volunteer administration leadership competence,
3. Determine southern region 4-H county faculty's leadership styles.

Procedures

This study used a survey research methodology with three questionnaires to collect the necessary information in order to accomplish the objectives. This is a descriptive study by nature with the intent of summarizing key characteristics of 4-H county faculty in the southern region.

This study was part of a larger national 4-H study, which had the target population of all 4-H county faculty in the United States (Stedman & Rudd, 2004). An accessible population was derived from a random sample of states representing each extension region and then a random sample of 4-H county faculty from the selected states. Dillman's (2000) Tailored Design Method was utilized to minimize sources of error, including coverage, non-response, and sampling error. Sixty-five participants were randomly selected from the southern region to participate in the study. Researchers calculated a response rate of 52% based on this figure (n=34).

Early and late respondents were compared in order to determine if any statistical difference existed (Lindner, Murphy, & Briers, 2001). The double-dipping technique was used to determine if nonresponse was a concern. Miller and Smith (1983) reported late respondents are often similar to early and this was the case when the two groups were compared in this study. Analysis confirmed no significant differences existed between early and late respondents.

To collect data, three questionnaires were used, the Volunteer Administration Leadership Competency Instrument (VALCI), the Multifactor Leadership Questionnaire (MLQ) and a short demographic instrument. The VALCI was designed as a web-administered questionnaire and contained 52 independent statements allowing respondents to provide answers on two levels, perceived proficiency and perceived importance. The questionnaire addressed each of the seven key competencies of volunteer administration, organizational leadership, systems leadership, accountability, management skills, personal skills, organizational culture and commitment to the profession. Perceived proficiency statements were measured using a Likert-type scale of 1 (Poor) to 5 (Excellent), similarly, the perceived importance statements used a scale of 1 (Strongly Disagree) to 5 (Strongly Agree). Southern region 4-H faculty's competence in volunteer administration was measured using the mean difference between perceived proficiency scores and perceived importance scores. Cronbach's alphas for each construct were .78, .82, .83, .90, .78, .78, and .91.

The MLQ was a 45-statement questionnaire measuring leadership based on leadership behaviors and styles Bass and Avolio (2000b). Using a Likert-type scale, 0 (Not at all) to 4 (Frequently) respondents self-reported leadership style based on a number of behavior, or factor statements. For the purposes of this study the questionnaire was administered on the web, versus the traditional paper-based form. The reliability of leadership behaviors, or factors, ranged from .74 to .91 and leadership styles, or outcomes, ranging from .91 to .94 (Bass and Avolio, 2000b).

Transformational leadership was measured using 20 statements associated with the behaviors of idealized influence (behavior and attributed), intellectual stimulation, individualized consideration and inspirational motivation. Transactional leadership was measured using 12 statements, using the behaviors of contingent reward and management-by-exception (active and passive). Laissez faire leadership was measured by four statements, identified as passive avoidant.

Findings

Objective 1. Determine selected demographics of southern region 4-H county faculty

This data was included to provide readers with an overall picture of who the respondents of the study were. Of the faculty responding, 76.5% (*n*=26) were women, with 23.5% (*n*=8) reporting male. Race was categorized into dichotomous variables. There were more white respondents than non-white, (82.4% (*n*=28) white and 8.8% (*n*=3) non-white). Table 1 summarizes race and gender findings.

Table 1
Gender and Race of Southern Region 4-H County Faculty (N=34)

		f	Percent	Cumulative Percent
Gender	Male	8	23.5	23.5
	Female	26	76.5	100.0
Race	White	28	82.4	82.4
	Non-White	3	8.8	91.2
	Missing	3	8.8	100.0

The highest percentage of southern region 4-H faculty were under age 30 (26.5%, *n*=9), with the majority of respondents under age 40 (67.7%, *n*=23), depicted in Table 2. Tenure, categorized by length of time in extension and length of time as a volunteer administrator, ranged from 1-5 years (32.35%, *n*=11) to 21-25 years (5.88%, *n*=2), found in Table 3.

Table 2
Age of Southern Region 4-H County Faculty (N=34)

Age Range	*f*	Percent	Cumulative Percent
26-30	9	26.5	26.5
31-35	7	20.6	47.1
36-40	7	20.6	67.6
41-45	3	8.8	76.5
46-50	5	14.7	91.2
51-55	2	5.9	97.1
56-60	1	2.9	100.0
Total	34	100.0	

Objective 2. Describe southern region 4-H county faculty's perceived proficiency in and perceived importance of in volunteer administration leadership competence

Southern region 4-H county faculty (*n*=34) scored perceived proficiency in (*M*=84.75, *SD*=10.07) and perceived importance of (*M*=94.02, *SD*=6.26) personal skills the highest of the seven competency areas. Similarly, they scored organizational culture perceived proficiency (*M*=75.08, *SD*=15.05) and perceived importance (*M*=88.06, *SD*=8.87) second. Ranking on the remaining five competencies were not equal among perceived proficiency and perceived importance. However, in terms of overall volunteer administration leadership competence two scores provided the greatest significance in future programming, accountability (*M*-difference=20.90) and management skills (*M*-difference=20.07). Table 4 provides a summary of the ranking scores of all seven competencies.

Table 3
Tenure of Southern Region 4-H County Faculty in Years (N=34)

Tenure Range	*f*	Percent	Cumulative Percent
1-5	11	32.4	32.4
6-10	8	23.5	55.9
11-15	6	17.7	73.6
16-20	6	17.7	91.3
21-25	2	5.9	97.2
Missing	1	2.8	100.0
Total	34	100.0	

Table 4
Volunteer Administration Competence of Southern Region 4-H County Faculty (N=34)

	Proficiency		Importance		*M* Difference
Competency	*M*	*SD*	*M*	*SD*	
Personal Skills	84.75	10.07	94.02	6.26	9.27
Organizational Culture	75.08	15.05	88.06	8.87	12.98
Commitment to the Profession	73.50	16.38	86.38	14.44	12.88
Systems Leadership	72.11	9.23	87.50	9.67	15.39
Organizational Leadership	71.59	7.85	87.72	7.82	16.23
Management	66.02	14.47	86.09	12.89	20.07
Accountability	62.73	15.02	83.63	10.47	20.90

Objective 3. Determine southern region 4-H county faculty's leadership behaviors and leadership styles

Leadership behaviors, or factors of 4-H county faculty in the southern region (*n*=34) were scored individually. Of the five transformational behaviors, individualized consideration was scored highest (*M*=3.00, *SD*=.53), with inspirational motivation second (*M*=2.93, *SD*=.56). In terms of the transactional behaviors measured, contingent reward (*M*=2.80, *SD*=.58) scored highest and scored higher than the transformational behaviors of idealized influence (attributed) (*M*=2.78, *SD*=.45), idealized influence (behavior) (*M*=2.65, *SD*=.61) and intellectual stimulation (*M*=2.76, *SD*=.56). Management-by-exception behaviors scored lower, active (*M*=1.37, *SD*=.67) and passive (*M*=1.21, *SD*=.69). Lastly, laissez faire (*M*=.76, *SD*=.45) was scored lowest of all behaviors, or factors and leadership styles, or outcomes.

The leadership styles, or outcomes scores, were relative to the behavior scores with transformational leadership (*M*=2.82, *SD*=.47) scoring highest, followed by transactional leadership (*M*=1.79, *SD*=.41) and laissez faire (*M*=.76, *SD*=.45). Table 5 provides these findings.

Table 5
Leadership Behaviors and Styles of Southern Region 4-H Faculty (N=34)

Behavior/Style	*M*	*SD*
Individualized Consideration	3.00	.53
Inspirational Motivation	2.93	.56
Transformational	2.82	.47
Contingent Reward	2.80	.58
Idealized Influence (Attributed)	2.78	.45
Intellectual Stimulation	2.76	.56
Idealized Influence (Behavior)	2.65	.61
Transactional	1.79	.41
Management-by-Exception (Active)	1.37	.67
Management-by-Exception (Passive)	1.21	.69
Laissez Faire	.76	.45

Conclusions

Objective 1

Although this data was not used to analyze perceptions of faculty, it provided a comparison for understanding who the respondents of the study were and how they compared to the larger national study. In the southern region 76.5% of 4-H county faculty were female. This is much higher than the 66% reported nationally (Stedman, 2004). Male county faculty in the southern region are not as well represented, at 23.5%, versus at the national level (33.0%). Male 4-H county faculty are still underrepresented at both the national and regional level. 4-H county faculty in the southern region have a higher percentage of non-white faculty (8.8%) compared to the national level (4.2%) (Stedman, 2004). In actuality, the number of faculty is still low at both levels. The percentage of non-white faculty members at both the national and regional level is not proportional to the number of 4-H youth reported as non-white (31% national and 40% southern region) (National 4-H Headquarters, 2004).

4-H county faculty in the southern region are younger than their national counterparts, with 47% (*n*=16) 35 years of age and younger compared to only 29% (*n*=28) at the national level (Stedman, 2004). Another dimension measured was tenure; tenure represented the length of time in extension, as well as, length of time as a volunteer administrator. Similar to the age of respondents, 55.9% (*n*=19) of respondents reported tenure 10 years and less. These two variables, when considered together indicated that 4-H is investing time and energy in acquainting and preparing younger and less experienced faculty for their roles as county faculty.

Objective 2

A key finding of this study was the identification of deficiencies in volunteer administration leadership competencies of 4-H county faculty in the southern region. 4-H county faculty were found to be deficient in management skills (*M*-difference=20.07), which are more representative of volunteer management models, than of management theories. County faculty are not prepared, or at the least, do not perceive themselves as proficient in this area. Yet, this management competence is fundamental in recruiting, retaining, supervising and evaluating volunteers.

The second and greatest competency identified as deficient was accountability (*M*-difference=20.90). Being accountable and providing documentation as to the importance and relevance of a program is substantial when it comes to continued funding internally and from external sources. While southern region 4-H county faculty were weak in these areas, the same two areas were identified nationally as areas of perceived deficiency (Stedman, 2004).

Objective 3

Lastly, the study addressed leadership style. Southern region 4-H county faculty may be identified as more transformational, due to the higher scores of transformational behaviors or factors (*M*=2.82, *SD*=.47), than those of transactional (*M*=1.79, *SD*=.41) or laissez-faire (*M*=.76, *SD*=.45). However, their use of contingent reward behaviors (*M*=2.80, *SD*=.58) over the transformational behaviors of idealized influence (attributed and behavior) (*M*=2.78, *SD=.45*, *M*=2.65, *SD=.61)* and intellectual stimulation (*M*=2.76, *SD*=.56) is not relational to the Bass and Avolio (2000b) model specifying all transformational behaviors should be used more frequently than those of transactional or laissez-faire. However, these regional scores do closely align with the national 4-H county faculty (Stedman, 2004).

Recommendations

There are some general recommendations that were derived from the findings and conclusions of this study. These are only recommendations that may be applicable to 4-H county faculty serving the southern extension region.

In regards to the diversity of 4-H county faculty in the southern region, there needs to be a stronger initiative to recruit and retain faculty that are more representative of the population that is being served. Candidates that are qualified and underrepresented, including men and non-white perspectives, should be sought out and encouraged to apply for opened positions. There should also be further research investigating the relationship between selected demographics and the leadership of volunteer programs.

Because 4-H county faculty in the southern region are, not only younger, but also less tenured, there should be a concerted effort to ensure more in-service educational program opportunities, especially to meet identified needs. Additionally, there are more experienced seasoned faculty capable of providing the most individualistic education available, mentoring. Mentoring programs that orient and provide a supportive contact for new or younger faculty members can assist in overall job satisfaction and retention (Kutilek, Gunderson, & Conklin, 2002; Zimmer & Smith, 1992).

The most appropriate recommendation is for in-service educational programs based on the conclusion there are two key areas of identified perceived deficiency of 4-H county faculty in the southern region. These programs must be made available to county faculty members to better prepare them for their roles as volunteer administrators. Specifically, web-based curriculum that is tailored made to suit the specific needs of faculty members, in this case it would be management and accountability. Programs that are experientially-based and build on the current and past experiences of faculty would also be beneficial, to develop the life-long learning capacity of county faculty.

Lastly, 4-H county faculty, while in technical balance with full range leadership, transformational leadership scores are higher than others, still need guidance and practical examples of how to develop their leadership potential. Again, providing these educational opportunities has to be the focus, content and curriculum can be developed; however, without the proper administrative and fiscal support, these initiatives can dwindle and the benefits lost.

Discussions/Implications

It is important to continue the discussion of volunteer administration leadership competence and leadership styles of 4-H faculty, on a national scale. In a time of budget instability, volunteers' roles will continue to be important in meeting the target audience needs. Diversity issues will continue to be paramount, as national concerns over underrepresented populations grow.

This study provides some key benchmark data for addressing some of these concerns at the regional level. Change can only happen when individuals are willing to set goals, which speak to the needs of 4-H county faculty and clientele, including volunteers. Research needs to continue in these areas providing insight into the most effective ways to educate extension faculty in volunteer administration leadership and personal leadership. This research can be beneficial in the developing volunteer programs and in return encouraging and soliciting greater participation by experienced volunteers and those new to the Cooperative Extension Service.

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NATIONAL FFA CAREER DEVELOPMENT EVENTS: AN INTROSPECTIVE INQUIRY

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Abstract

The purpose of this study is to determine why students participate in national career development events and to examine factors related to their participation. A survey was completed by 2145 FFA members and by 206 FFA advisor/coaches in 2003. FFA members who participate in national career development events are generally pleased with the conduct of the events and find them valuable to their education. FFA members are trained for national FFA career development events primarily by their agriculture teacher. This training generally lasts between one and five hours per week and will most likely occur after normal school hours. Teachers and students in this study disagree as to the reason why members participate in national career development events. Teachers believe that the most important reason for participation is competition, but students indicate that their most important reason for participation is that the event relates to their career choice.

Introduction

The FFA Organization provides leadership and personal development opportunities for students enrolled in agricultural education. In agricultural education, students learn skills related to specific agricultural occupations and, in a broader sense, develop their agricultural literacy through exposure to the general concepts of the food, fiber, and natural resources industry. In agricultural education, the finished product is a student's knowledge of the agriculture industry. The FFA proposes to add value to this product by improving a student's leadership ability, personal communication skills and personal work habits. For the students who wish to pursue agricultural careers, the personal and professional development provided by the FFA is intended to assist them once they enter the workforce. For the student who is enrolled in agricultural education primarily for the purpose of providing agricultural literacy, the FFA provides the opportunity to experience all aspects of agriculture - from seed to market to boardroom.

In 2004, the National FFA Organization completed a five-year review process of the FFA career development events and found that a mechanism was needed to align CDE's with projected careers as they become available in the food, fiber and natural resources industry. Furthermore, the FFA needed to find ways to involve more middle grade students in career development events. The report also indicated a need to continue efforts to assist new teachers in improving overall participation in CDE's and to document the relationship between curriculum and career development events. The report further indicated a need to continue efforts to improve participation in CDE's by a diverse population of students enrolled in agricultural education (National FFA Organization, 2004).

This research project sought to examine one segment of the total FFA program – career development events [CDE's]. According to the National FFA Organization (2000), one of the most highly esteemed benefits of FFA membership is the connection established between the student and the agriculture industry. The career development events program is intended to provide students with the opportunity to practice skills learned in the classroom and on the job, but does it effectively meet both the FFA program's goals and the goals of individual FFA members? Are career development events meeting the career needs of FFA members?

Theoretical Framework

The purpose of this study is to determine why students participate in national career development events and to examine factors related to their participation in national career development events. In order to assess the effectiveness of career development events, the researchers conducted an evaluation study, and the theoretical base for it is derived from the CIPP model developed by Stufflebeam and Shinkfield (1985). The goal of the CIPP evaluation model is not to prove, but rather to improve programs (Stufflebeam, 2001). To accomplish program improvement, this model utilizes four core components, or types of evaluations – context evaluation, input evaluation, process evaluation, and product evaluation. The context evaluation component determines the needs of a specific program and helps to define the program's objectives. The input evaluation phase identifies resources needed by the program. The process evaluation answers the question, "How well has the program been implemented?" The final evaluation phase examines the outcomes of the program to determine if the objectives have been met (Stufflebeam, 2003). The CIPP model is useful because it is relatively easy to organize the evaluation process around the four components (Worthen, Sanders, Fitzpatrick, 1997). This comprehensive model allows the context, input and process evaluations to take place while simultaneously waiting for the product evaluation (Payne, 1994). Because of the impact this model has on program administration, it is important to have both internal and external evaluators. This helps control bias in interpreting results (Stufflebeam, 2001).

To gather contextual data, the National FFA Organization has established a career development events advisory board to annually review and make recommendations regarding changes in the structure and operation of career development events. Every five years, the National FFA Organization completes a systematic and comprehensive review process of career development events to determine if they are congruent with the FFA mission, and that they are still relevant to technological advancements in the food, fiber, and natural resources industry (National FFA Organization, 2004). The National FFA Organization also gathers demographic data from participants during the career development events. This includes data about FFA members, coaches, and the schools, FFA chapters and communities where the school resides.

To gather input and process data, the National FFA Organization collects opinion data from member participants and their coaches during the career development events. Some of the data that might be collected from these opinion surveys includes information about the school curriculum in agricultural education, instructional materials used to prepare teams, and funding for CDE team preparation and travel to the national event. Informal observations by CDE event staff and national FFA staff are also valuable sources of data.

For many teachers, even beginning teachers, interacting with students through participation in FFA activities is an enjoyable part of the job of teaching (Talbert, Camp, and

Heath-Camp, 1994). Although managing the FFA program is a demanding task (Mundt & Conners, 1999), one of the effective teaching responsibilities identified by Roberts and Dyer (2002) is to prepare students for participation in career development events.

Overall, FFA members believe that the FFA provides valuable assistance in helping students choose a career and that FFA programming also helps them reach certain education goals as well (Croom & Flowers, 2001). Those students who are involved in FFA activities and who choose to attend college are significantly more likely to earn a baccalaureate degree (Ball and Garton, 2002). Students who participate in a number of FFA activities including career development events complete their agricultural education program and tend to enter an agricultural occupation (Fraze & Briers, 1986; Bowen & Doerfort, 1989). However, Scanlon, Yoder, Hoover, and Johnson (1989) report that the essential practices perceived to be most effective by teachers in recruiting and retaining FFA members were participation in career development events, FFA activities, and awards programs. Rossetti, McCaslin, and Gliem (1996) found that FFA members reported that the reason why they chose to be a member was based on the organization's ability to help them achieve future career goals. The study further reports that a student's interest in FFA activities and programs and the enjoyment derived from them, and leadership skill development were major reasons for being a member. The National FFA Organization should develop new career development events based upon emerging student interests and agricultural technologies. These recognition programs should be periodically reviewed to determine their effectiveness in motivating students (Shinn & Vaughn, 1993).

Purpose And Objectives

The purpose of this study is to determine what motivates students to participate in national career development events and to examine factors related to their participation in career development events. The specific research questions addressed by this study are:

1. What motivates students to participate in national career development events?
2. What are the perceptions of students regarding the conduct of the national career development events?
3. How are students prepared to participate in the national career development events?
4. Is there a difference between advisors' and students' perceptions of participation and preparation in career development events?

Procedures

The population for this study was the total number of registered participants in the career development events held at the 2003 National FFA Convention in Louisville, Kentucky. This population included both the FFA member participants and their coaches, and was selected because these individuals had advanced to the highest level of participation in this FFA program. The student survey was completed by 2145 FFA members and the teacher survey was completed by 206 adults who serve as the coach for a particular student or team in a career development event. Respondents in the student survey were asked to complete 31 items related to the educational value of the national career development events in which they participated, the quality of the event itself, and methods of recognition. The Likert-based items on the survey instrument ranged from 1 = Strongly Disagree to 5 = Strongly Agree, and from 1 = least important to 5 = most important. Respondents in the teacher survey were asked to complete 24 items related to the educational value of the national career development events in which they participated, the relationship to curriculum, types of instruction materials and training methods. Likert-based items on the instrument ranged from 1 = Strongly Disagree to 5 = Strongly Agree, and from 1 = least important to 5 = most important. The instrument was developed by a team of professional educators who work closely with national FFA career development events. The instrument's validity was established by teacher educators with experience in FFA programs. A reliability analysis yielded Kuder-Richardson 20 coefficient scores of .79 for the student survey and .70 for the teacher survey. The instrument was administered to participants upon completion of their respective career development event.

Findings

The 2145 student respondents were almost equally divided according to gender, although the females held a slight majority at 48.5% when compared to the male respondents (48.4%). The majority of respondents were Caucasian (92.2%) with the second largest ethnic population in the study being Native Americans (1.6%). There were no African American respondents in the survey. Most of the students were juniors and seniors in high school (61.8%), and the majority of respondents had been FFA members for three or more years (76.5%). The majority were from a rural farm community (63.4%). Almost half of the respondents reported that the chapter FFA degree was the highest degree they held at the time of the national career development events, and 12.9% reported that they had earned no degree at all. Seventy-five percent of respondents reported that the 2003 national FFA career development event in which they were participating was their first one. Twenty-four percent of respondents had participated in two or more national career development events.

Participants were asked to rate five items based upon the impact these items had on their decision to participate in the national career development event. Participants ranked competition as having the least impact on their decision to participate in a national career development event. The item that most influenced the respondents' decision to participate was that the national career development event related to their career choice (see Table 1). An independent samples t-test found that female students ranked career choice significantly higher than male students. Male students rated the opportunity to earn scholarships and to develop leadership skills significantly higher than female students.

Respondents reported that participation in the national career development event evaluated their current knowledge of the agriculture subject specific to the event (M = 4.13, SD = 0.91), and that classroom instruction was useful preparation for the event (M = 3.84, SD = 1.09). Respondents agreed that participation better prepared them for future employment opportunities (M = 3.81, SD = 1.03), and exposed them to new career areas associated with the career development event (M = 3.60, SD = 1.10). To a lesser extent, respondents agreed that participation was valuable to their career preparation (M = 3.47, SD = 1.18) and that it related to their supervised agricultural experience (M = 3.21, SD = 1.34) (see Table 2).

Table 1
Participant responses to items regarding their decision to participate in a national career development event.

Item	Male Students (N = 1039)		Female Students (N = 1041)		
	Mean	SD	Mean	SD	*t-value*
Relates To Career Choice	3.04	1.39	2.87	1.45	2.81*
Leadership Development	3.21	1.21	3.71	1.18	-.9.46*
Scholarship Awards	3.53	1.31	3.75	1.19	-3.95*
Travel/Fun	3.80	1.23	3.72	1.21	.1.42
Competition	3.92	1.09	3.98	1.06	-1.24

Note. 1 = Most Important, 5 = Least Important.
*p<.01.

Table 2
Mean scores of respondents regarding the educational value of the career development event.

Item (N = 2145)	Mean	SD
This specific event evaluated my current knowledge and ability.	4.13	0.91
The instruction I received during my agriculture classes prepared me to participate in this event.	3.84	1.09
By participating in this event, I am better prepared to compete for future employment opportunities.	3.81	1.03
My participation in this event exposed me to new career areas.	3.60	1.10
Participation in the event was a value to my career preparation.	3.47	1.18
The event was related to my supervised agricultural experience.	3.21	1.34

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

Respondents agreed that the instructions they received regarding the computerized scoring process (M = 4.27, SD = 0.91) as well as overall event procedures were clearly explained (M = 4.03, SD = 1.02). Rules were enforced fairly (M = 4.18, SD = 0.99) and distractions were limited (M = 3.54, SD = 1.17). The facilities were adequate for the event (M = 3.96, SD = 0.98), and materials used by the respondents allowed them to perform at their best performance level (M = 3.90, SD = 1.02) and they were able to complete the event activities in a timely manner (M = 3.92, SD = 1.17). Overall, respondents reported that both they (M = 3.92, SD = 1.03) and their team members (M = 3.84, SD = 1.03) were prepared to participate in the event (see Table 3).

Seven items on the survey instrument asked respondents to rate the common methods of recognition for participation in career development events (see Table 4). Respondents rated scholarships (M = 4.52, SD = 0.84) as the most important method of recognition among all other items. Respondents also rated tangible representations of their achievement in the form of medals, plaques, and trophies (M = 3.60, SD = 1.06). Respondents also rated publicity in news media (M = 3.33, SD = 1.14), award functions (M = 3.32, SD = 1.10), and internships (M = 3.29, SD 1.26) as important. Respondents were neutral towards certificates as a form of recognition (M = 2.90, SD = 1.16) and main stage recognition (M = 3.14, SD = 1.21).

Table 3
Mean scores of respondents regarding the quality of the national career development event.

Item (N =2145)	Mean	SD
I understood the instructions given for completing the computer score sheets.	4.27	0.91
Event committee enforced the rules for this event in a fair manner.	4.18	0.99
The degree of difficulty was appropriate for this level of competition.	4.11	0.94
Event procedures were explained clearly by event officials.	4.03	1.02
Facilities used for the event were adequate.	3.96	0.98
I was prepared to participate in this event.	3.92	1.03
I had enough time to complete the event activities.	3.92	1.17
Materials used during the event allowed me to perform at my best level.	3.90	1.02
My team was prepared to participate in this event.	3.84	1.03
Distractions were limited.	3.54	1.17

Note. 1 = Strongly Disagree to 5 = Strongly Agree.

Table 4
Respondents' opinions on the importance of selected recognition methods.

Items (N = 2145)	Mean	SD
Scholarships	4.52	0.84
Plaques/Medals/Trophies	3.60	1.06
Publicity, Local or Regional Newspaper Articles	3.33	1.14
Recognition at Award Functions	3.32	1.10
Internships with Event Sponsors	3.29	1.26
Main Stage Recognition	3.14	1.21
Certificates	2.90	1.16

Note. 5 = Most Important, 1 = Least Important.

More than two-thirds (68.6%, N = 1472) of respondents planned to attend a college or university as a full time student upon graduation from high school, and 6.5% (N = 140) plan to attend college on a part-time basis. An additional 4.7% (N = 101) plan to continue their education in a technical school. When asked what they would do if they attended college, 17.4% (N = 373) of members would pursue a degree in food, fiber and natural resources while 70.3% of members (N = 1508) would seek a degree in another career area. Thirty-five respondents have no future educational plans at the time this survey was administered. After high school, 16 students expect to become employed full-time in the food, fiber and natural resources industry and 19 students (0.9%) plan to seek full-time employment in an industry not related to agriculture.

Thirteen percent (N = 279) of respondents reported that they eventually intend to seek a career in the food, fiber and natural resource industry in which they will use the skills they learned as a direct result of their participation in a specific career development event. An additional 165 respondents (7.7%) plan to enter a food, fiber and natural resource career, but not in the CDE area in which they participated. Eight hundred and seven respondents (37.6%) plan to use the skills they learned in this event in a career not related to the food, fiber and natural resource industry. Skills notwithstanding, 346 respondents (16.1%) plan to pursue a career outside of the food, fiber and natural resource industry. Fifty-two students (2.4%) plan to enter military service

The majority of career development event coaches who completed the survey instrument were agriculture teachers (98.5%), and three out of every four career development event coaches were males (75.8%). Almost all of these coaches were Caucasian (96.1%), 2% were Native American, 1% Pacific Islander, and 1% Hispanic. There were no African American or Filipino respondents for the coaches' survey in the career development events at the 2003 National FFA Convention. Most of the teacher respondents (43.7%) had prepared between one and three teams for national competition. Slightly less than one-third (30.7%) of all CDE coach/respondents had taught for 21 years or more. Most of the respondents reported teaching in a comprehensive high school with grades nine through 12 (72.4%), and most of these schools are in a rural farm community (54.1%). The majority of respondents work in a one-teacher (43.3%) or a two-teacher (34.3%) program. Roughly three-fourths of the teacher respondents (77.7%) reported that less than half of the students they teach come from an agricultural background.

Most respondents (60.3%) believed that instruction about the area of agriculture represented by the career development event was integrated into their curriculum (see Table 5). The teacher-respondents overwhelmingly agreed that the career development events accurately evaluated student knowledge and ability (90.3%).

Table 5
Teachers views on the relationship between classroom instruction and curriculum to career development events

How the event related to classroom instruction.	Responses (N = 184)	
	Frequency	Percent
No relationship to the curriculum.	13	7.1
The curriculum included a unit of instruction.	48	26.1
The curriculum integrates several units of instruction.	111	60.3
The curriculum specialized in this area of agriculture.	12	6.5

Competition was the most frequent answer given by teacher-respondents (48.5% very important, 37.9% important) as the most important reason why students prepared for career development events (see Table 6). Teacher respondents also indicated that their encouragement often motivated students to prepare for career development events (41.9% very important, 30.3% important) and that travel and the fun associated with it were also very important reasons (30.7% very important, 33.7% important).

When Do Agriculture Teachers Train Their CDE Teams?

Students were asked when they were trained for the CDE's. There was no single clear-cut answer. CDE teams appear to be trained during class time, after school, before school and on holidays and weekends. The data indicate most teachers use a combination of these times. However, there were some observable trends. It is a rare teacher who does all of the CDE training before school. Only .61 percent of the responses fell into this category while 13.5 percent of the responses indicate teachers never train CDE teams before school. The most identified time to train CDE teams is after school (see Table 7). The majority of teachers spent one to five hours per week training students for national CDE competition (see Table 8).

Table 6
Teacher-Respondents' perceptions of why students are motivated to prepare for the career development event.

Item	N	Mean	SD
Competition	198	1.71	.86
Encouraged by agriculture teacher	198	2.01	1.10
Travel/fun	199	2.22	1.11
Development of leadership skills	198	2.25	1.12
Relationship to program curriculum	197	2.72	1.17
Relates to students' career choice	198	2.83	1.21

Note: 1 = most important, 5 = least important

Table 7
When Agriculture Teachers Train Teams as Reported by Students

	Never	Some Times	Moderately	Very Frequently	Always
During Class	6.04%	9.50%	4.37%	3.65%	1.39%
Before School	13.50%	7.21%	1.95%	1.56%	0.61%
After School	1.97%	7.38%	6.63%	6.66%	2.51%
On Holidays and Weekends	5.57%	9.94%	4.65%	3.56%	1.36%

Note. The National FFA had students check one of 11 categories (0%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, and 100%) for each row of data. Because of the unwieldiness of these data, the data were regrouped into five categories (Never = 0%, Some Times = 10, 20 & 30%, Moderately = 40, 50 & 60%, Very Frequently =70, 80, & 90%, Always = 100%). The number of responses in each category were summed and then divided by the grand total number of responses to derive a percentage.

Table 8
Teacher-respondent estimates on the amount of time spent preparing students for the national FFA career development event

How much time was spent preparing students for the event?	Responses (N = 192)	
	Frequency	Percent
All training completed during a scheduled agriculture class.	11	5.7
1-2 hours per week beyond classroom instruction	68	35.4
3-5 hours per week beyond classroom instruction	71	37.0
5-10 hours per week beyond classroom instruction	31	16.1
More than 10 hours per week beyond classroom instruction	11	5.7

Conclusions, Discussion, Implications and Recommendations

Conclusion 1: Among a list of potential reasons why students participate in national FFA career development events, the most important reason selected by students was to learn skills that will translate into a career option for them once they graduate from high school. Female participants are significantly more likely than males to participate because the career development relates to their career choice. Male participants are more likely than females to participate for leadership development and scholarships.

Conclusion 2: Even though almost half of the FFA members who participate in national career development events indicate that they do not plan to pursue careers in the food fiber and natural resource industry, they are generally pleased with the conduct of the events and find them valuable to their education.

Conclusion 3: The agriculture teacher primarily trains FFA members for national FFA career development events. This training generally lasts between one and five hours per week and will most likely occur after normal school hours.

Conclusion 4: Teachers and students in this study disagree as to the reason why members participate in national career development events. Teachers believe that the most important reason for participation is competition, but students indicate that their most important reason for participation is that the event relates to their career choice.

Some cynics may say that participation in national CDE's is, "Because the students won the state event." This answer is too simple because students choose whether or not they will advance to national competition. Furthermore, it does not explain why students chose to participate in career development events in the first place, nor does it explain why they chose to devote the time and effort necessary to be in a position to win the preliminary events leading up to the national event.

The concept of career development events rests largely on a system of competition, and it is surprising that students rank competition as the least of reasons behind their decision to prepare for a career development event. In addition to career choice, students also ranked leadership development and scholarship awards above competition, suggesting that students are becoming more concerned about developing skills in the competition that really matters to them – finding, acquiring, and building a career in a chosen occupation. In this case, career development events are succeeding because students believe that they are receiving content-specific instruction and are better prepared for a chosen career because of it.

The ratings given by member respondents indicate that the National FFA Organization is running a smooth operation with regard to career development events. Students know what is expected of them when they compete, and the event is structured so that students feel that they have done their best work.

If you wish to make a student happy upon completion of the career development event, it may be best to award a scholarship for exemplary achievement in addition to plaques and trophies. Many students in this study intend to go to college after their high school years, and financing a college education is very much on their minds. As more women move into executive leadership positions in business, there emerges an opportunity for the FFA and agricultural education to deliver high quality business–oriented leadership training, and provide the scholarships necessary for young women to continue their education in college.

Out of the 2145 survey responses received from students at the 2003 career development events, none came from African American students. It would seem that if there were any African American students in the national career development events that at least one or two would have completed the survey instrument. The obvious implication is that African American students are an underserved population in agricultural education and FFA, especially when it comes to reaching the highest level of career development events. The obvious recommendation is for the agricultural education profession find ways to involve African American students in career development events, but a better investment of time and resources might be to find better ways to "turn them on" to agricultural careers. If the profession can convince African American students and their instructors that an agriculturally related career is an alternative for them, then perhaps we will see increased participation by them in national career development events.

Although students indicates their reason for participating in a national career development event was because it related to their career choice, a significant number of them planned to seek careers outside of the food, fiber and natural resources industry. Is this an indication that the mission of agricultural education has shifted more toward agricultural literacy than career preparation? Will the agricultural education profession be content serving a significant population of students who do not intend to pursue a career in the industry?

The lack of a discernable pattern in the training schedule for national career development events suggests that teachers are finding it difficult to schedule practices when all team members can be present. Teachers and students might be finding themselves dodging meetings, after school work schedules, after school transportation problems, and other school and FFA activities in search of the ideal practice time for CDE's. Teachers may soon experience burnout if they spend too much of their personal time preparing students for career development events.

Teachers rated competition as the issue of primary importance while the students rated it the issue of least importance. Students rated career preparation as their primary reason for participation in national CDE's while teachers rated it as the issue of least importance. One might suggest that teachers are overemphasizing competition at the expense of the students. However, a more accurate answer may be that competition is what keeps teachers motivated to prepare students for career development events year after year. The students are receiving awards and important career preparation, and the teachers are receiving recognition for having their students appear in a national career development event. The prestige of having won a state career development event and advancing to national competition may be one of the intangible rewards teachers earn in a life devoted to teaching.

As a result of this study, it is recommended that further research be conducted in the area of program planning and resource allocation in agricultural education programs. Teachers may need assistance in effectively managing their agricultural education program so that the amount of personal time needed for FFA activities during weekends and holidays can be significantly reduced. It is also recommended that the National FFA Organization partner with the agricultural education profession to seek ways to effective strengthen diversity among students. The FFA should also continue its system of evaluation for career development events. FFA career development events should maintain their relevancy as advances are made in the food fiber and natural resources industry.

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DEVELOPMENT OF YOUTH LEADERSHIP LIFE SKILLS OF TEXAS YOUTH AS SAN ANTONIO LIVESTOCK EXPOSITION SCHOOL TOUR GUIDES

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Abstract

The purpose of this study was to determine if Texas 4-H, FFA, and FCCLA members were developing leadership life skills through their participation as school tour guides at the San Antonio Livestock Exposition. Additionally, demographic characteristics were evaluated to determine which of these characteristics affected leadership life skills development. All school tour guides returning for the afternoon exit-meeting during the 2004 San Antonio Livestock Exposition were asked to complete the questionnaire. This resulted in 1,691 responses. The questionnaire was a 28-item survey that was based on the scales: working with groups, understanding self, communicating, making decisions, and leadership. Conclusions showed that school tour guides were developing leadership life skills through their participation. The most influential demographic characteristics were gender, previous leadership experiences, and ethnicity. Females and those participants who had had previous leadership experiences had stronger perceptions of their leadership life skills. In addition, African Americans, Asian Americans, Hispanics, and Anglos all had stronger perceptions of their leadership life skills when compared to Native Americans.

Introduction

Since the beginning of 4-H, FFA, and Family, Career, and Community Leaders of America (FCCLA) programs, the goal has been to produce productive members of society through the development of leadership life skills in the youth enrolled in their programs. Youth organizations offer countless opportunities for members to learn and develop leadership life skills that are important in becoming contributable members of society as adults. 4-H, FFA, and FCCLA are just three of many youth organizations available. Members of these organizations can participate in numerous types of projects ranging from family and consumer sciences to agriculture and public speaking to leadership. These programs employ the motto of "learning by doing." By participating in hands-on experiences, youth are better able to learn and apply these necessary skills to their lifestyles (Wingenbach & Kahler, 1997; and Howard, 2001).

4-H, FFA, and FCCLA members are given numerous opportunities to engage in leadership development activities. One such activity is the School Tours Program at San Antonio Livestock Exposition. The San Antonio Livestock Exposition (SALE) School Tours Program was created in 1990 to provide a safe, guided tour of the show grounds to students of San Antonio and the surrounding areas. Each year, about 20,000 kindergarten through third grade students are invited as guests of the School Tours Program who are guided through exhibits by 4-H, FFA, and FCCLA members.

Theoretical Framework

Leadership education has been an integral part of experiential youth leadership organizations. Three of these organizations are 4-H, FFA, and Family, Career, and Community Leaders of America (FCCLA). The 4-H program is the youth component of the Cooperative Extension Service, which serves youth ages 8 to 19. The National FFA Organization is an agricultural education program that serves high school youth. FCCLA is national vocational organization for high school students interested in family and consumer sciences education. By their very nature and purpose, these organizations focus on the development of youth through various activities. Most assume that these organizations are successful at developing leadership life skills through the programs and opportunities they offer to their members. Nevertheless, is this perception true? Recently, organizations such as these are focusing on the effectiveness of the leadership training they offer to their members to provide accountability for and to continually improve their respective programs (Wingenbach & Kahler, 1997; Howard, 2001; and Rutherford, Townsend, Briers, Cummins, & Conrad, 2002).

Holder and Wilkinson (2001) state that to be a good leader, one needs to develop several types of skills that can be used in many ways throughout life; thus, they are called leadership life skills. They define seven leadership life skill areas: understanding self, communicating, getting along with others, learning to learn, making decisions, managing, and working with groups. These seven areas match the seven constructs of youth leadership life skill development as described by Seevers, Dormody, and Clason (1995). These seven constructs where originally based on work of Miller (1976) who defined youth leadership life skills as “development of life skills necessary to perform leadership functions in real life” (p. 2). Townsend and Carter (1983) also studied youth leadership life skills and provide five scales of leadership: working with groups, understanding self, making decisions, communication, and leadership.

Boyd, Herring, and Briers (1992) compared YLLSD of Texas 4-H members to non-members, and examined the relationship between YLLSD and level of participation in 4-H. The researchers found that Texas 4-H members’ perceptions of their YLLSD were significantly higher than the perceptions of non-members. In addition, the researchers found that Texas 4-H members’ level of YLLSD increased as their level of participation in 4-H activities increased.

Determining predictors of YLLSD of youth in Arizona, Colorado, and New Mexico was the purpose of two similar studies conducted by Seevers and Dormody (1994) of senior 4-H members and by Dormody and Seevers (1994) of FFA members. The two major findings of this study were that three variables – achievement expectancy, participation in FFA leadership activities, and gender – explained statistically significant amounts of variance in YLLSDS scores; and YLLSD was not related to self-esteem, years in FFA, age, ethnicity, or place of residence. The findings of this study are in contrast to the results of the similar study conducted by Seevers and Dormody (1994) of 4-H members. Four variables attributed to variance in YLLSDS scores: participation in leadership activities, ethnicity, achievement expectancy, and gender.

Using an adapted version of the YLLSDS developed by Seevers et al. (1995), Wingenbach and Kahler (1997) explored the relationship between Iowa FFA members’ self-perceived leadership and life skills development and their participation in youth leadership activities. The researchers found “the strongest statistically significant relationship existed between [YLLSD] and FFA leadership activities" (p.23). Other factors that related to YLLSD were years of membership in FFA, age, jobs, achievement expectancy, club officer, church groups, and class officer. These researchers also found that the female FFA members participating in "this study significantly outscored their male counterparts on the YLLSDS section" (p. 23) of the questionnaire (Wingenbach & Kahler, 1997).

Many researchers have studied leadership life skills through overall involvement of experiential youth leadership organizations and indicated that youth truly are developing these skills and they are retaining them into their adulthood (Boyd, Herring, & Briers, 1992; Dormody & Seevers, 1994; Seevers & Dormody, 1994; Wingenbach & Kahler, 1997; Howard, 2001; and Rutherford, Townsend, Briers, Cummins, and Conrad, 2002). However, none of these studies have specifically addressed whether participation as a school tour guide at San Antonio Livestock Exposition develops youth leadership life skills.

Purpose and Objectives

The purpose of this study was to determine if Texas 4-H, FFA, and FCCLA members developed youth leadership life skills from their participation as school tour guides. The following objectives were set to guide this study.

1. Describe the demographic characteristics of school tour guides at the 2004 San Antonio Livestock Exposition.
2. Determine if Texas 4-H, FFA, and FCCLA members developed leadership life skills as school tour guides according to the Leadership Skills Inventory.
3. Determine which demographic variables affected youth leadership life skills development.

For the purpose of this study, leadership life skills referred to the five scales measured by the Leadership Skills Inventory: Working with Groups, Understanding Self, Communicating, Making Decisions, and Leadership. Also, for the purpose of this study, demographic variables were defined as gender, age, ethnicity, youth organization membership, years of membership, years of experience as a school tour guide, and previous leadership skills training.

Procedures

Descriptive survey methodology and a correlational design were used in this study. The dependent variable was youth leadership life skills development. The independent variables were gender, age, ethnicity, youth organization membership, years of membership, years of experience as a school tour guide, and previous leadership skills training. Both the dependent and independent variables were measured following their natural occurrence. The population of interest was Texas 4-H, FFA, and FCCLA members that served as school tour guides at the San Antonio Livestock Exposition. To ensure parental consent, letters were sent to teachers of each participating 4-H County, FFA Chapter, and FCCLA Chapter. A cover letter was sent to all 4-H, FFA, and FCCLA sponsors requesting that an additional letter be sent home with each school tour guide for parental review. Parents were to review the letter before their child participated as a school tour guide. All school tour guides returning for the afternoon exit-meeting during the 2004 San Antonio Livestock Exposition were asked to complete the questionnaire. A total of

1,691 questionnaires were returned. The instrument used was the Leadership Skills Inventory (LSI) developed and tested by Townsend and Carter at Iowa State University (Townsend & Carter, 1983). The LSI consisted of 21 statements describing different leadership and life skills. The instrument contained five internal scales: Working with Others, Understanding Self, Communicating, Making Decisions, and Leadership. The 21 questions were categorized into the five internal scales. Reliabilities ranged from .69 to .83. The reliabilities for each scale were as follows: Working with Groups (.74), Understanding Self (.75), Communicating (.69), Making Decisions (.71), and Leadership (.83).

Findings

The first objective was to describe the demographic characteristics of school tour guides at the 2004 San Antonio Livestock Exposition. The SPSS procedure FREQUENCIES was used to compute the demographic characteristics of gender, age, ethnicity, organization membership, years of membership, years as a school tour guide, and previous leadership skills training. These results are shown in Table 1. There were slightly more than twice as many female respondents as male respondents. Reported ages were as follows: 120 participants were fourteen years old or younger (12.3%), 178 were fifteen years old (18.2%), 233 were sixteen years old (23.9%), 228 were seventeen years old (23.4%), 178 were eighteen years old or older (18.2%). The largest ethnic group represented was White/Anglo with 571 respondents (58.5%). This was followed by Hispanic with 241 respondents (24.7%).

School tour guides were members of one of three groups: FFA (36.3%), FCCLA (35.1%), or 4-H (22.5%). Nearly half of all students have been members of their respective organization for only one to two years (47.1%). The majority of students were first-year educational school tour guides (56.7%). A total of 377 (38.6%) of students indicated that they had previous leadership training experiences and 528 (54.1%) claimed they had not; 71 did not respond. Of these 377 respondents who have had previous leadership skills experience, 117 (31.0%) respondents received at least a minimum of this experience through their respective 4-H, FFA, or FCCLA program.

The second objective was to determine if Texas 4-H, FFA, and FCCLA members were developing leadership life skills as school tour guides according to the Leadership Skills Inventory. All scales had means of 4.13 or greater, indicating that school tour guides perceived that they are developing leadership life skills through their participation as school tour guides (Table 2).

Table 1
Selected Demographic Characteristics of School Tour Guides

Characteristic		Frequency	Percentage
Gender	Male	282	28.9
	Female	623	63.8
	Did not report	71	7.3
Age	14 years or younger	120	12.3
	15	178	18.2
	16	233	23.9
	17	228	23.4
	18 years or older	178	18.2
	Did not report	39	4.0
Ethnicity	African American	54	5.5
	Asian American	46	4.7
	Hispanic	241	24.7
	Native American	14	1.4
	White/Anglo	571	58.5
	Mixed Ethnicities	12	1.2
	Did not report	38	3.9
Organization Membership	4-H	220	22.5
	FFA	354	36.3
	FCCLA	343	35.1
	Did not report	59	6.0
Years as a Member	1-2 years	460	47.1
	3-4 years	213	21.8
	5-6 years	109	11.2
	7-8 years	91	9.3
	9-10 years	64	6.6
	Did not report	39	4.0
Years as Tour Guide	1 year	553	56.7
	2 years	212	21.7
	3 years	88	9.0
	4 years	43	4.4
	5 years	38	3.9
	Did not report	42	4.3
Previous Leadership Training	Yes	377	38.6
	No	528	54.1
	Did not report	71	7.3

Table 2
School Tour Guides Self-Perceptions of Youth Leadership Life Skills Development

Scale	Mean[a]	SD
Working with Groups	4.39	.53
Understanding Self	4.40	.55
Communicating	4.22	.63
Making Decisions	4.23	.67
Leadership	4.13	.69
Overall	4.29	.53

[a]1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly Agree.

The third objective was to determine which demographic variables affected youth leadership life skills development. For the purpose of this study, demographic variables were defined as gender, age, ethnicity, youth organization membership, years of membership, years of experience as a school tour guide, and previous leadership skills training. A T-test of independent means was computed to determine if youth leadership life skills development differed by gender. A summary of these results are presented in Table 3. Statistically significant differences were found in all five scales at the 0.05 significance level. Females had a stronger perception of their abilities on all five levels than when compared to males.

Table 3
t-test for Independent Samples: Gender and Youth Leadership Life Skills Development

Scale		N	Mean[a]	SD	p
Working with Groups	Male	275	4.28	.58	<.001**
	Female	616	4.46	.46	
Understanding Self	Male	271	4.35	.57	.005**
	Female	615	4.45	.48	
Communicating	Male	276	4.15	.66	.007**
	Female	619	4.27	.60	
Making Decisions	Male	277	4.09	.68	<.001**
	Female	619	4.30	.62	
Leadership	Male	274	4.07	.68	.042*
	Female	611	4.17	.68	
Overall	Male	258	4.19	.55	<.001**
	Female	595	4.35	.47	

[a]1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly Agree.
*Significant when $p < .05$. **Significant when $p < .01$.

To determine if youth leadership life skills development differed by age, a Pearson correlation coefficient was computed between each of the measurement scales and age. The correlation coefficient was evaluated using a two-tailed test with a significance level of 0.05. Table 4 presents the correlation coefficients for each of the five measurement scales. A statistically significant correlation was found between age and the scales of Working with Groups, Understanding Self, and Communicating. These correlations coefficients were 0.078, 0.071, and 0.067, respectively. This indicated only a negligible relationship between age and youth leadership life skills development. This suggests that the older the school tour guides were, the greater perception they had of the abilities to work with groups, understand themselves, and communicate.

Table 4
Pearson Correlation Coefficient between Age and Leadership Life Skills Development

		Age	
Scale	N	r	p
Working with groups	921	.078*	.017
Understanding self	918	.071*	.032
Communicating	925	.067*	.043
Making decisions	927	.050	.131
Leadership	912	.048	.150
Overall	876	.072*	.034

*Correlation is significant at the 0.05 level (2-tailed).

To determine if youth leadership life skills development differed by ethnicity, an analysis of variance of scales was computed using the procedure ANOVA. A summary of these results are displayed in Table 5. Statistically significant differences were found in three of the scales (Working with Groups, Understanding Self, and Making Decisions) and overall leadership life skills development. Tukey's HSD post hoc comparison was used to detect differences among ethnic groups. Table 5 displays these results. Three scales measuring leadership life skills development were statistically different at the .05 level when grouped by ethnicity: Working with Groups, Understanding Self, and Making Decisions. Two scales were statistically different at the .01 level when grouped by ethnicity: Communicating and Leadership.

Table 5
Analysis of Variance of Scales Measuring Leadership Life Skills by Ethnicity

	Mean Score by Ethnicity							
Scale	Afr	Asian	Hisp	Nat	Anglo	Mixed	F	p
Working with Groups	4.48^{ac}	4.26^{abc}	4.42^{ac}	4.02^{b}	4.39^{abc}	4.03^{bc}	3.362	.005*
Understanding Self	4.36^{a}	4.24^{a}	4.40^{a}	3.76^{b}	4.44^{a}	4.15^{ab}	5.649	<.001*
Communicating	4.19^{ab}	4.12^{ab}	4.20^{b}	4.21^{a}	3.73^{b}	4.25^{ab}	2.505	.029**
Making Decisions	4.17^{ab}	4.25^{a}	4.26^{a}	3.52^{c}	4.24^{a}	3.67^{bc}	5.168	<.001*
Leadership	4.16^{a}	4.16^{a}	4.22^{a}	4.11^{b}	3.49^{a}	4.14^{a}	2.682	.020**
Overall	4.32^{a}	4.25^{a}	4.31^{a}	3.74^{b}	4.30^{a}	4.00^{ab}	3.750	.002**

[1]1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly Agree. [2]Afr = African American, Asian = Asian American, Hisp = Hispanic, Nat = Native American, Anglo = White/Anglo, Mixed = Mixed Ethnicities. [3]Means not sharing a letter are different as determined by Tukey's HSD post hoc comparison.
*Significant at p < .05. **Significant at p < .01.

To determine if youth leadership life skills development differed by previous leadership training experiences, the researcher looked at the data in three different forms. The first was an analysis of the number of previous leadership training experiences by calculating a Pearson correlation coefficient between each of the measurement scales and the number of previous leadership training experiences (Table 6). The second analysis was simply whether the school tour guide had previous leadership training experience. A Pearson correlation coefficient was calculated between each of the measurement scales and whether the student had previous leadership experiences (Table 7). This resulted in a statically significant difference between those with previous leadership experience and those with none. The final analysis only took into account those school tour guides that provided examples of previous leadership experience. A T-test was used to determine if a difference existed between a previous experience in 4-H, FFA, or FCCLA ("Ag") and another organization or program ("Non-Ag") (Table 8).

Table 6
Pearson Correlation Coefficient between Previous Leadership Experiences and Leadership Life Skills Development of School Tour Guides

	Number of Previous Experiences		
Scale	N	r	p
Working with groups	935	.054	.096
Understanding self	930	.103**	.002
Communicating	937	.119**	<.001
Making decisions	940	.100**	.002
Leadership	922	.157**	<.001
Overall	885	.119**	<.001

**Correlation is significant at the 0.01 level (2-tailed).

Table 7
Pearson Correlation Coefficient between Whether the Student Had Previous Leadership Experiences and Leadership Life Skills Development of School Tour Guides

	Previous Experience (Yes or No)		
Scale	N	r	p
Working with groups	890	.089**	.008
Understanding self	890	.090**	.007
Communicating	897	.158**	<.001
Making decisions	897	.113**	.001
Leadership	884	.204**	<.001
Overall	853	.156**	<.001

**Correlation is significant at the 0.01 level (2-tailed).

Conclusions

Objective 1 was to determine demographic characteristics of school tour guides at the 2004 San Antonio Livestock Exposition. These demographic characteristics included gender, age, ethnicity, youth organization membership, years as a member, years as a school tour guide, and previous leadership training experiences. The conclusions related to this objective are as follows:

Table 8
t-test for independent samples: Ag or Non-Ag Previous Leadership Experience and Leadership Life Skills Development

Scale		N	Mean	SD	p
Working with Groups	Ag	114	4.49	0.46	.613
	Non-Ag	56	4.53	0.43	
Understanding Self	Ag	116	4.55	0.46	.209
	Non-Ag	56	4.46	0.43	
Communicating	Ag	115	4.36	0.59	.822
	Non-Ag	57	4.38	0.52	
Making Decisions	Ag	116	4.39	0.54	.931
	Non-Ag	57	4.38	0.59	
Leadership	Ag	115	4.34	0.67	.563
	Non-Ag	57	4.29	0.52	
Overall	Ag	112	4.43	0.45	.867
	Non-Ag	55	4.42	0.42	

[a]1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly Agree

1. *Gender*: Female respondents significantly outnumbered male respondents. Questionnaires were completed by 282 males (28.9%) and 623 females (63.8%).

2. *Age*: There were 977 respondents to age: 120 participants were fourteen years old or younger (12.3%), 178 were fifteen years old (18.2%), 233 were sixteen years old (23.9%), 228 were seventeen years old (23.4%), and 178 were eighteen years old or older (18.2%).

3. *Ethnicity*: The majority of respondents were White/Anglo with 571 respondents (58.5%). The next largest ethnic group was Hispanic with 241 respondents (24.7%). African American, Asian American, and Native Americans claimed only a small percentage of school tour guides. Twelve tour guides declared a mixed ethnicity (1.2%).

4. *Youth Organization Membership*: School tour guides are members of at least one of three organizations: 4-H, FFA, and FCCLA. The participants were grouped as follows: FFA (36.3%), FCCLA (35.1%), or 4-H (22.5%).

5. *Years as a Member*: Most school tour guides have been members of their respective organization for one to four years.

6. *Years as a School Tour Guide*: The majority of respondents were first-year educational school tour guides (56.7%). About one-fourth (21.7%) of school tour guides were participating for their second year.

7. *Previous Leadership Skills Training Experience*: Slightly over one-third (38.6%) of participants indicated that they had received previous leadership skills training. The majority had not.

Objective 2 was to determine if school tour guides were developing youth leadership life skills according to the Leadership Skills Inventory. The conclusions related to this objective are as follows:

1. The overall mean for leadership life skill development was 4.29 indicating that school tour guides "agreed" with all statements within in the Leadership Skills Inventory. Tour guides perceived themselves as having a higher level of leadership life skill development for the scales Working with Groups (4.39) and Understanding Self (4.40) than the remaining areas. The means for Communicating (4.22) and Making Decisions (4.23) were also similar to one another. Even though guides perceived themselves as having the least development in the Leadership (4.13) scale, they still perceived themselves as developing leadership skills.

2. If leadership life skills are being developed in one scale area, then they are also being developed in other areas due to intercorrelation(s) of the leadership life skills scales. Substantial, positive relationships existed between all scale areas with the exception of three relationships, which were very strong: Working with Groups and Understanding Self (.70); Communicating and Making Decisions (.71); and Communicating and Leadership (.83).

Objective 3 was to determine which demographic variables affected youth leadership life skill development. Demographic variables were defined as gender, age, ethnicity, youth organization membership, years of membership, years of experience as a school tour guide, and previous leadership skills training. The conclusions related to this objective are as follows:

1. Females perceived themselves as having stronger leadership life skills in all five scales: Working with Groups, Understanding Self, Communicating, Making Decisions, and Leadership than did males. Differences in means for Working with Groups, Understanding Self, Communicating, and Making Decisions were all significant at the.01 level. Differences in means for the scale of Leadership were significant at the .05 level.

2. Negligible, positive relationships existed between age and the three scales of Working with Groups, Understanding Self, and Communicating. Correlation coefficients ranged from .067 to .078. School tour guides perceived themselves as being better able to work with groups, understand themselves, and communicate as they mature.

3. In looking at Overall leadership life skills development, Native Americans differed from African Americans, Asian Americans, Hispanics, and Anglos. These four groups all indicated a stronger perception of their leadership life skills development than did Native Americans.

4. Positive relationships existed between previous leadership experiences and leadership life skills development. This indicated that participants receiving any previous leadership training experience had a higher level of leadership life skills development.

Programmatic Recommendations

The following recommendations are based on the findings and conclusions of this study.

1. Youth need to be encouraged to participate as school tour guides. The tour guides in this study have developed leadership life skills.

2. Males do not perceive themselves as having leadership life skills as great as females. Future 4-H, FFA, and FCCLA programs should focus on the development of leadership life skills with males to increase their self- perceptions.

3. There were over twice as many female school tour guides than male. Since this activity provided an opportunity for leadership life skills development, more males should be encouraged to participate as school tour guides.

4. Native Americans do not perceive themselves as having leadership life skills as strong as African Americans, Asian Americans, Hispanics, and Anglos. Future 4-H, FFA, and FCCLA programming should focus on the further development of leadership life skills of Native Americans.

5. For those school tour guides with previous leadership experiences, the scales of Leadership and Communicating indicated the highest levels of development. This suggested that educators are doing a good job in teaching these skills; however, future 4-H, FFA, and FCCLA programming should further develop students' skills in the areas of Working with Groups, Understanding Self, and Making Decisions.

6. Educators should encourage youth to participate in any activity that promotes youth leadership life skills development. This recommendation was based on the finding that school tour guides with any previous leadership experience had a greater perception of their leadership life skills than those who had not.

Recommendations for Additional Research

The following recommendations are based on the findings and conclusions of this study.

1. It is recommended to further investigate school tour guides to determine where guides are developing leadership life skills. A pre-test, post-test design may be used to determine if participation as a school tour guide is contributing to the development of leadership life skills.

2. It is recommended to investigate the reasons why female school tour guides perceived themselves as having a higher level of leadership life skills development than males.

3. Another recommendation is to investigate the differences between ethnic groups. Specifically, the researcher should look at what causes Native Americans to perceive themselves as having lower levels of leadership life skills development when compared to other groups.

4. The relationship between participation in the previous leadership experiences should be investigated to determine which activities are contributing the most to the development of leadership life skills.

5. It is recommended to investigate why so many more females than males participate as school tour guides.

6. It is recommended that students who are not involved in extracurricular youth organizations be studied to understand the differences between members of youth organizations and other students.

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STUDENT DEMOGRAPHICS, EXTRACURRICULAR PARTICIPATION AND SAFETY EDUCATION OF STUDENTS PARTICIPATING IN THE 2003 HOUSTON LIVESTOCK SHOW AND RODEO AGRICULTURAL MECHANICS PROJECT SHOW

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Abstract

The Houston Livestock Show and Rodeo Agricultural Mechanics Project Show is the largest show of it kind in Texas, and perhaps the largest in the nation. This extracurricular activity provides students and agricultural education programs an opportunity to display skills developed in agricultural mechanics laboratories by exhibiting projects constructed entirely by students. Projects such as gooseneck trailers, bulk feeders, cattle chutes, truck bumpers, and tractor accessories are designed, constructed and exhibited. It is perhaps the most comprehensive opportunity for authentic assessment in agricultural education.

The primary method of data collection for this descriptive study was a survey completed and collected during the 2003 Project Show. Results of the study revealed that an overwhelming percentage of students in the activity were white males. Surprisingly over one-third indicated the FFA was the only extracurricular activity in which they participated. Regarding safety, more than 90% indicated they had taken a safety exam and received instruction in topics such as fire, ear/hearing, tool, chemical, greenhouse, and eye safety. Unfortunately, just over three-fourths had learned about electrical safety, and even lower percentages had received instruction on electrical and equipment safety. More than two out of five students indicated they were not required to wear eye protection in the agricultural mechanics laboratory, and almost four out of five were not required to wear ear/hearing protection.

Introduction

Agricultural education programs offer many unique hands-on opportunities and extracurricular activities to develop both valuable academic and career skills for its students. A large body of research exists that indicates that extracurricular activities improve student self-esteem, self-perception, grades and health, as well as a wide variety of other issues including lowering absenteeism and disciplinary problems (Grafford, 2004). Mahoney and Cairns (1997) looked at the positive connection to school that participating in extracurricular activities created among student whose prior commitment to the school had been marginal. They discovered that a wider choice of activities resulted in a stronger effect because students' individual needs and interests were more likely to be met. Agricultural laboratories provide opportunities for students to engage in scientific inquiry and application through the design, development and presentation of mechanics projects. Experiential learning, or learning by doing, is the foundation of agricultural education (Making a Difference, 2002).

The interrelationship of extracurricular participation and classroom learning is unique to agricultural education. Laboratories and out-of-school activities available in secondary agricultural education programs are very diverse. Facilities are a mix of classrooms, greenhouses, agricultural mechanics, aquaculture and food processing laboratories, school farms, and off-campus livestock facilities. Extracurricular activities available to students are just as diverse as the facilities. Activities including leadership, communication and personal skills development, judging and livestock showing events and mechanical skills development are widely available.

While preparing students for progression to the university, community college, or careers in the agricultural industry, traditional vocational laboratories of programs are often less than ideal examples of appropriate work environments (Hubert, Ullrich, Lindner & Murphy, 2001). Agricultural laboratories also create the opportunity for students to design and build various projects and offers opportunities for these students to exhibit their projects at organized events. McNeal (1995) indicated that extra curricular participation provide previously marginalized students with access to a more “elite” stratum of the student population and exposes the students to peers who have better attitudes toward school.

Student popularity of traditional laboratory courses, particularly agricultural mechanics, is substantiated as up to two-thirds of teacher course assignments may be spent in these laboratories (Shinn, 1988). Unfortunately, teacher preparation in the area of agricultural mechanics and safety instruction continues to be limited (Hubert, 1996) and this may indicate a weakness is safety preparedness and the creation of a total safety climate within the facility. Furthermore, participation in agricultural mechanics project shows in Texas has increased dramatically during the past decade (Harrell & Muller, 2003). Extracurricular activities such as these offer opportunities for students to learn the values of teamwork, individual and group responsibility, physical strength and endurance, competition, diversity, and a sense of culture and community. Lamborn (1992) and Finn (1993) stated that extracurricular activities provide a channel for reinforcing the lessons learned in the classroom, offering students the opportunity to apply academic skills in a real-world context, and are thus considered part of a well-rounded education.

Theoretical/Conceptual Framework

Over the past decade, concerns for the health and safety of student populations, as well as extracurricular involvement, in Texas have grown in importance. Districts have complicated these two issues by increasing demands on teachers to improve scores on state-mandated tests and through Texas policy of local control of state-based educational funding. These decisions have placed career and technology (vocational-based) programs at the bottom of the importance hierarchy; thus, such programs have endured financial neglect by administrators in favor of computer labs or other hi-tech courses that seem to emphasize test-taking skills. This is notably consequential in the case of student health in laboratories stocked with dangerous equipment, as the cause of greatest concern for the health of children and adolescents has become unintentional injuries (U.S. Department of Health and Human Services, 1990.)

According to Dyer and Andreasen (1999), agricultural education laboratories and shops can be hazardous teaching and learning environments. In such laboratories, injuries and mishaps often go unnoticed by the teacher and contribute to inadequate reinforcement of proper student work habits (Hubert, Ullrich, Lindner & Murphy 2001). This may be especially true when teachers and students rush to meet deadlines for entry into various agricultural mechanics project shows.

In such project-oriented courses, Phipps and Osborne (1988) question whether the primary aim of laboratory instruction is skill development or project construction. Too often project completion timetables are set by fair entry deadlines. Project completion takes precedence over skill development progress. If skill development is the focus of laboratory instruction, then thorough attention to all its components, including safety instruction, is essential. These authors further indicate that teachers need to use the laboratory to help students learn and develop efficient work habits and positive attitudes toward working, while also insuring safe laboratory conditions conducive to the growth of each student.

To combat the prospect of student injury in shops or laboratories, a strong safety climate must be instituted in programs. It is recognized that safety is not the most glamorous component of most courses. Safety education is covered, albeit in various degrees, within a lesson for specific tool use or unit of instruction (Hubert, Ullrich and Murphy 2000). Teachers must be aware of what they say and do for they are the ones ultimately responsible for the consequences of their own actions (McCormick, 1994). If teachers fail to promote and follow safety procedures, students may likely follow suit. From this perspective, one must be mindful of the consequences teachers' actions and behaviors have on students' learning and attitudes toward safety.

Adolescents tend to see things in black and white and fail to take into account the perplexities and complexities of the real world (Clark & Starr, 1996). They tend to live in a risk-taking world where ignoring the rules adds to the excitement of the moment. Frequent risk-taking is "normative, healthy, developmental behavior for adolescents" (Ponton, 1997, p.6). Such risk-taking, however, often results in unintended consequences and must not be allowed to stand as the norm in career and technology programs. Agricultural education programs supported with laboratories are designed to present real-world situations to students in safe learning environments. The primary focus of laboratory instruction should be to develop students' ability to perform the skills needed in real occupational settings (Hubert, Ullrich, Lindner & Murphy, 2001). In the course of skill development, evidence suggests that students will be more safety conscious if teachers also follow proper safety practices, demonstrate accurate safety knowledge, provide a safe laboratory environment, convey a positive safety attitude, and relay safety expectations to students (Harper, 1984).

Phipps and Osborne (1988) assert that a major portion of laboratory supervision by the teacher is to emphasize and demonstrate safety, provide feedback on students' safety procedures, and provide relevant feedback and reinforcement for student performance. No teacher wants to be the defendant in a negligence lawsuit brought against his or her district. Teachers of vocational agriculture, school administrators, and boards of education have been found extremely vulnerable to being found negligent and liable if a student were injured in the agriculture shop (Gliem and Hard, 1988). Crunkilton and Krebs (1982) asserted that a person learns what is practiced, whereas McCormick (1994) stressed learning connotes a change of behavior. Unsafe student behaviors put a program at risk. Sullivan (1990) concluded that modeling safe behavior is one of the 16 actions necessary to protect students from injury. Thus, a student injured from an unsafe practice demonstrated by the teacher could result in costly and preventable consequence to the teacher, program, school, and district. We must remember the teacher is responsible for promoting desirable attitudes that assist pupils in developing a proper respect for safety (Kigin, 1983).

Further identification of the less safe practices of teachers is necessary. That is, those teachers who believe safety is important are more willing to adhere to safety laws, policies, and practices, thereby resulting in safer teaching and learning environments, lower student injury rates, and decreased legal liability (Hubert, Ullrich, Lindner & Murphy, 2001). The Houston Livestock Show and Rodeo Agricultural Mechanics Project Show is most likely the single largest authentic assessment extracurricular activity completed based on actual demonstration of mechanical and presentation skills. Furthermore, issues concerning the development of safety skills and attitudes during project construction are essential to reduce the incidence of future injuries.

The Agricultural Mechanics Project Show held during the Houston Livestock Show and Rodeo has been an integral part of developing the workmanship and mechanical skills of youth in Texas for over 20 years. During the 2002 event nearly 700 projects, ranging from gooseneck trailers to bulk feeders to cattle chutes to truck bumpers and tractor accessories, were displayed by approximately 800 agricultural education youth and constructed by well over 2400 in laboratories dispersed across the state (W. Harrell & J. Muller, personal communications, October 15, 2003). This being the largest single event of its kind, data concerning participant demographics, extracurricular activities and safety education would be helpful in identifying weaknesses in safety education program.

Purpose and Objectives

This project's purpose was to gather data concerning the participating students and schools that participated in the Houston Livestock Show and Rodeo's Agricultural Mechanics Project Show. The specific objectives were to:

1. determine demographic characteristics of respondents;
2. determine other extracurricular activities in which the students participate; and
3. determine the types and extent of safety education received before working on projects.

Procedures

The target population of this study was Texas agricultural education students participating in the 2003 Houston Livestock Show and Rodeo Agricultural Mechanics Project Show. Because this is descriptive research sponsored by the Houston Livestock Show and Rodeo, a questionnaire was developed based upon a series of student and program characteristics and following a review of the literature by the researchers. The instrument consisted of three sections: Demographics, Extracurricular Participation and Personal Health and Safety Training.

A panel of high school agricultural mechanics students and agricultural education teachers reviewed the instrument and identified items to be included, modified or removed to improve for face and content validity. To improve reliability, the instrument was field tested with agricultural science teachers and high school students involved in agricultural education programs during the Area IX, Sam Houston District FFA meeting at Huntsville High School.

Eight hundred surveys were prepared with approximately 650 being distributed during the entry and set-up day of the 2003 Houston Livestock Show and Rodeo Agricultural Mechanics Project Show. Students and teachers returned 568 surveys or 87.38% of those distributed. A qualifying question was used to eliminate those students whose projects were entered through 4-H programs; thus, 43 surveys were removed. Also 31 were identified as incomplete and unusable. This allowed for a useable return rate of approximately 76.15%. The descriptive date were tabulated using Microsoft Excel®.

Findings

Objective one was to describe students participating in the 2003 Houston Livestock Show and Rodeo Agricultural Mechanics Project Show. An overwhelming majority (88.06%) of the respondents were males. The average age of the respondents was 16.86 years old and the age and ethnicity distribution is shown in Table 1. It is also obvious when reviewing the data illustrated in Table 2, that Anglo (non-Hispanic) students comprise the vast majority (93.50%) of the participants with Hispanics being a distant second (4.07%).

Table 1
Age Distribution of Respondents

Age in Years	Frequency of Responses
13	19 (3.85%)
14	51 (10.32%)
15	77 (15.59%)
16	194 (39.27%)
17	138 (27.93%)
18	15 (3.04%)

n = 494

Table 2
Ethnicity Distribution of Respondents

Ethnicity	Frequency of Responses
Anglo (non-Hispanic)	460 (93.50%)
Hispanic	20 (4.07%)
African American	6 (1.22%)
Other	3 (0.61%)
Native American	2 (0.41%)
More than one ethnicity	1 (0.20%)
Asian	0 (0.00%)

n = 494

Objective two was to describe the extracurricular participation of students involved in the 2003 Houston Livestock Show and Rodeo Agricultural Mechanics Project Show. All 494 respondents were members of the Texas FFA Association. One item of note was that over one-third of the respondents listed FFA as their only extracurricular activity. Table 3 describes the various activities in which the respondents identified as being involved.

Table 3
Frequency of Respondents Extracurricular Activities

Activity	Frequency of Responses
FFA	494 (100%)
Football	153 (30.97%)
4-H	102 (20.64%)
Track	102 (20.65%)
Baseball	74 (14.98%)
Basketball	70 (14.17%)
Volleyball	16 (3.23%)
Softball	15 (3.05%)
Tennis	14 (2.83%)
Other various activities	74 (14.98)
Other C&T Clubs	70 (14.17%)
Beta / Honor Society	64 (12.96%)
Band / Choir	33 (6.68%)
Foreign Language Club	24 (4.86%)
Cheerleading / Dance	16 (3.24%)

n = 494

Objective three was to determine the types and extent of safety education received before working on projects, and these results are displayed in Table 4. The vast majority of responding students (96.36%) indicated that they had taken a safety exam and had been presented material on: fire safety (95.55%), CPR instruction (95.14%), ear or hearing safety (94.13%), chemical safety (93.32%), greenhouse safety (91.30%), and eye safety (90.69%). Also, almost 95 percent of students understood that their safety exams were filed at school.

To a lesser degree students were presented material on electrical safety (77.33%), biohazard safety (71.26%) and equipment safety (67.61%). Interesting to note is that over three-fourths of the students were presented material through computers to learn about safety or first aid. Furthermore, a slight majority indicated that they were required to wear safety glasses in the laboratory (57.70%), have received first aid training (53.24%) or had a teacher demonstrate hand and power tool safety (52.43%). Not surprisingly, less than half had a guest speaker present topics concerning safety in class and were presented topics on animal safety. A last item is that just slightly more than 20 percent indicated that they were required to wear ear protection when working in the laboratory.

Table 4
Student Safety Instruction

Question	Yes	No	N/A
Have you ever taken a safety exam?	476 (96.36%)	18 (3.64%)	0 (0%)
Were you provided or presented material on fire safety?	472 (95.55%)	7 (1.42%)	15 (3.04%)
Have you received CPR instruction?	470 (95.14%)	11 (2.23%)	13 (2.63%)
Are your safety exams kept on file at school?	469 (94.94%)	11 (2.23%)	14 (2.83%)
Were you provided or presented material on ear or hearing safety?	465 (94.13%)	11 (2.23%)	14 (2.83%)
Were you provided or presented material on tool safety?	461 (93.32%)	15 (3.04%)	18 (3.64%)
Were you provided or presented material on chemical safety?	461 (93.32%)	17 (3.44%)	16 (3.24%)
Were you provided or presented material on greenhouse safety?	451(91.30%)	27 (5.47%)	16 (3.24%)
Were you provided or presented material on eye safety?	448 (90.69%)	29 (5.87%)	17 (3.44%)
Were you provided or presented material on electrical safety?	382 (77.33%)	81 (16.40%)	31 (6.23%)
Were you provided or presented material on computer to learn about safety or first aid?	379 (76.72%)	91 (18.42%)	24 (4.86%)
Were you provided or presented material on biohazard safety?	352 (71.26%)	97 (19.64%)	45 (9.11%)
Were you provided or presented material on equipment safety?	334 (67.61%)	108 (21.86%)	52 (10.53%)
When working in the agricultural mechanics laboratory were you required to wear eye protection?	285 (57.70%)	183 (37.04%)	26 (5.26%)
Have you received first aid instruction?	263 (53.24%)	206 (41.70%)	25 (5.06%)
My teacher has conducted hand and power tool safety demonstrations.	259 (52.43%)	187 (37.85%)	48 (9.72%)
Have you had a guest speaker in class talk to you about safety?	225 (45.55%)	215 (43.52%)	54 (10.93%)
Were you provided or presented material on animal safety?	223 (45.14%)	221 (44.74%)	50 (10.12%)
When working in the agricultural mechanics laboratory were you required to wear ear protection?	109 (22.06%)	52 (10.53%)	333 (67.41%)

n = 494

Conclusions

Positive safety climates and active extracurricular programs are essentials for the students to be successful and safe in any school system. Both of these topics are of concern to all agricultural education teachers to ensure the social development, skill improvement and the creation of safety attitudes, beliefs and practices.

One item of great concern to the researchers is the data concerning gender and ethnicity. Few females and students of an ethnicity other than Anglo are represented. Granted, a wide array of research studies illustrate that the ethnicity issue is not confined to agricultural mechanics participation.

Secondly, it can be inferred from a review of the data that a larger than expected number (175, or 35.43%) of participating students are active in the FFA program only. It might be further assumed that these students are largely involved only in the agricultural mechanics activities sponsored by the Houston Livestock Show and Rodeo and other similar organizations sponsoring project shows.

A vast majority of students are receiving safety education and materials concerning fire, ear and hearing protection, tools, chemicals, greenhouses and eye protection. Two issues of concern are that only three-fourths of the students are receiving instruction concerning electrical safety and equipment safety.

It is odd that a large majority of students are receiving CPR training but only slightly more than one-half receive training on first aid procedures. Is it possible that the term “CPR” confused the students? The researchers cannot explain this seemingly contradictory data and further review is necessary in this area.

Other issues that should be immediately addressed is the data revealing that less than 60 percent of the students were required to wear safety glasses, just over one-half had teachers that conducted tool and equipment demonstrations, and only a paltry 22 percent were required to wear hearing protection in the laboratory.

Teachers should use all avenues to address safety issues with their students, including demonstrations, guest speakers and computer aided instruction. None of these avenues were used at acceptable levels.

Recommendations

It is essential that agricultural education teachers involved in this program reflect upon this issue and identify roadblocks to ethnic and female participation. The ethnicity concern certainly expands across agricultural education and the FFA, but the gender issue is less prevalent. Barriers to participation, as well as factors contributing to existing stereotypes, needs further researched. Further study of teacher and student attitudes is recommended to identify possible biases.

If FFA agricultural mechanics activities are the only extracurricular activities in which these students are involved, the concept of project shows needs to be broadened and more outlets developed for student exhibits. As Black (2002) stated, students who participate in structured extracurricular activities are likely to have higher academic achievement and higher levels of commitment and attachment to school.

The percentage of students receiving instruction in electrical safety and equipment safety should be much higher and should be immediately addressed by agricultural educators. Anything less than 100% could prove fatal.

Similarly, 100% of the students should be responding that they are required to wear safety glasses and hearing protection in the laboratory. While economics should not be a limiting factor in this matter, national and state agricultural education leaders should develop partnerships with major companies in the safety industry to provide safety materials at little or no cost.

Perhaps the strongest recommendation that can be made is the proposal of a required course focusing solely on shop and laboratory safety. The agricultural education profession gives much attention to skill acquisition, and in some cases, requires special certification to teach related courses. Unfortunately, safety often receives only a token mention. The agricultural education program is always only one major laboratory accident away from having its safety instruction question and scrutinized. Efforts to address these specific findings will be discussed during workshops at the Professional Development Conference in Texas.

Additional research in the area of FFA activities is recommended to further assess their impact on student accomplishment, self-esteem and skill acquisition in high school and beyond.

Discussion/Implications

The implications that many students only participate in extracurricular agricultural mechanization exhibits creates unique implications. If such a large percentage of students only participate in these types of activities, we must develop other avenues for these students to exhibit their skills and more research needs to further define this area of perceived need.

Other findings of the study identified strengths and possible weaknesses in the safety education of students involved in programs that are widely considered premier or at least very good agricultural mechanics programs. Even though the issues of safety, safety education, facility management and safety problem identification has been a hot topic during the past five years at Professional Development Conferences in Texas, studies such as these still find concerns that need to be addressed.

Safety issues cannot be ignored and the development of a statewide safety development program is essential. If organizers of project shows, agricultural educators and experts from industry stress the importance of safety, continuous and systematic positive change will occur.

From another standpoint the researchers noticed the lack of ethnic and gender diversity in the project shows participants. This issue is of great concern and further effort and research needs to follow.

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THE PROCESS OF SUPERVISION WITH STUDENT TEACHER CHOICE: A QUALITATIVE STUDY

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Abstract

The purpose of this qualitative study was to explore three student teachers' development based on their selection of supervision. Student teachers majoring in agricultural education from a Southern state selected different avenues of supervision. One selected clinical supervision, one selected contextual supervision, and one selected cooperative professional development (an option from the differentiated supervision model). In addition, student teachers identified their leadership style, confronted their concerns related to teaching, analyzed their teaching style, and described the support they received from their cooperating teacher.

Introduction/Theoretical Framework

Typically, supervision has been viewed as a process that focuses on directing, controlling, or intimidating individuals (Sullivan & Glanz, 2000); however, the last decade has seen a "paradigm shift" to more of a collegial approach (Glickman, Gordon, and Ross-Gordon, 2001). This paradigm shift was brought about by criticisms of schools being unresponsive to the needs of teachers, parents, and children (Johnson, 1990). Therefore, schools have started to include teachers in the overall responsibilities of school policy (Johnson, 1990). In addition to having more responsibility in establishing school policy, teachers also need to have more input pertaining to their own developmental process. Recent research stated that if the supervisory process is to be effective, teachers need to have a voice in the evaluation of their teaching (Danielson, 1996). Allowing the supervisory process to be more follower-driven enriches and strengthens an organization (Gardner, 1990); therefore, the type of leadership provided to teachers becomes imperative.

Le0dership style can vary from individual to individual, particularly in educational settings. Some leadership styles are rooted in personality and others are based upon different situations. Examples of leadership styles rooted in personality are the legalist, realist, analyst, and empathist (Barrett, 1991). The legalist leader maintains, stabilizes, and organizes people; the realist leader negotiates, trouble-shoots, and take risks; the analyst leader is creative and multi-talented; and the empathist leader is service based and desires to serve a basic need for others (Barrett, 1991).

Contrary to leadership style based on personality, situational leadership (Hersey, Blanchard, and Johnson, 2001) is determined by a leader matching his/her leadership style to a person's willingness and ability to complete a particular task. For example, an individual who is knowledgeable in a particular area but lacks self-confidence may need encouragement from the leader but does not need help completing the task. As Knowles (1980) pointed out in his theory of andragogy, adults need to be involved in their learning experience. Therefore, the leadership process should take into account individual desires and concerns. In particular, a supervisor currently functioning as the leader in an educational system should be concerned with current teacher issues, particularly teacher concerns.

Fuller, Parsons, and Watkins (1974) clearly outlined three stages of teacher concerns: self-adequacy, teaching task, and teaching impact. Self-adequacy concerns are described mostly as survival concerns. These survival concerns often experienced by preservice and beginning teachers include supervisor's approval, administrative support, relationships with other teachers, subject matter adequacy, and discipline problems. Teaching tasks are concerns that are often felt by teachers who are now concerned with developing innovative teaching materials/methods and their specific workload. Teaching impact concerns are focused on the student as a whole. Teachers are now more focused on student needs and educational improvement. Moreover, teachers are concerned with personal/professional development and ethical issues within the educational system that could affect the student body. Thus, concerns vary from teacher to teacher and from school year to school year; therefore, the type of supervisory guidance given to teachers should vary.

Recently, Fritz and Miller (2003b) developed the Supervisory Options for Instructional Leaders (SOIL) Model (Figure 1) for supervisors in educational settings. The essence of leadership portrayed in the SOIL Model is selecting a particular leadership style that reflects the current developmental level of the teacher. The structured level of the model contains two supervisory approaches, clinical and conceptual, that offer a structured process for the supervisor and teacher to employ. The clinical supervisory model, developed by Goldhammer, Anderson, and Krajewski (1993) and Cogan (1973), identified five steps for the supervisor to follow. Those steps include: planning conference, classroom observation/data collection, analysis/strategy, supervision conference, and postconference analysis. The conceptual model developed by Edmeirer and Nicklaus (1999) outlined organizational factors (e.g., workload, classroom climate, support of colleagues, decision making, role conflict, support from supervisor via supervision) and personal factors (e.g., life stage, teaching assignment, interpersonal, intrapersonal, conceptual level, experience in education, knowledge of subject) that influence teacher commitment and trust in the teaching system as well as how these factors directly reflect the performance quality of a teacher. Furthermore, the structured level does not require a high level of risk by a supervisor or teacher, but it may not provide much reward.

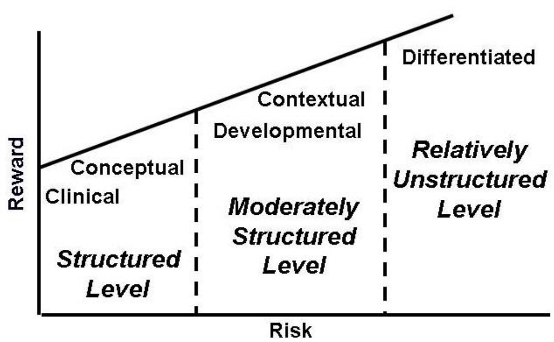

Figure 1. Supervisory Options for Instructional Leaders (SOIL) Model

The moderately structured level consists of developmental and contextual supervisory models. These models encourage teacher input in the supervisory process. The developmental model, created by Glickman et al. (2001), consists of three types of assistance from the supervisor: directive, collaborative and non-directive. Moreover, the contextual supervisory model (Ralph, 1998) focuses on matching supervisory styles to the readiness level of the teacher to perform a particular task. The leadership styles are telling, selling, participating, and delegating.

The relatively unstructured level consists of the differentiated supervisory model (Glatthorn, 1997). This model is a unique approach to supervision because it allows a teacher to choose which type of supervisory technique he/she will receive (Glatthorn, 1997). The techniques that are embodied in differentiated supervision are: intensive development, cooperative professional development, self-directed, and administrative monitoring. Intensive development is an extended form of clinical supervision that provides an opportunity for the supervisor and teacher to focus on one objective until the objective is perfected. Cooperative professional development is a form of supervision that includes a team of three to four teachers that observe each others classroom and provide feedback. Self-directed is completely influenced by the teacher; therefore, the teacher self-directs his/her own supervision through student feedback, videotapes, journals, and portfolios. Administrative monitoring consists of the supervisor arriving to a teacher's classroom unannounced to conduct a supervisory visit.

A study conducted by Fritz and Miller (2003a) revealed that teacher educators in agricultural education predominantly selected to use the clinical supervisory model with student teachers. However, the question remains, "What supervisory models would student teachers select from the SOIL Model to be used during the student teaching experience?" Prior to this study, no data has been published on the selection of supervisory models by student teachers in conjunction with their overall student teaching experience.

Purpose and Objectives

The purpose of this qualitative study was to explore student teachers' development based on their selection of supervision. The objectives of this study were to:

1. Identify the leadership style of each student teacher.
2. Identify student teacher concerns before and after the student teaching experience.
3. Describe the teaching style of each student teacher.
4. Describe each student teachers supervisory model selection.
5. Describe cooperating teacher support provided to each student teacher.

Methods and Procedures

This qualitative study utilized a phenomenologist or interpretivist approach to understand social phenomena from the actor's own perspective (Taylor & Bogden, 1998). Additionally, Lincoln and Guba (1985) suggested that the phenomena under study are only understandable when studied in the "natural" context (p. 189). Relative to these definitions, the researcher (s) chose to best represent student teachers by adhering to the process of qualitative methodology.

The qualitative method assists researchers in the process of locating emerging themes in the data to construct "grounded, inductive theory" rather than setting preconceived hypotheses and objectives (Glaser and Strauss, 1967). Specifically the researcher (s) sought to understand student teachers' experiences by utilizing participant observation, interviews, questionnaires, and weekly reflection journals. This method of data gathering is referred to as methodological triangulation. Methodological triangulation, as described by Patton (1987), is the combination of data gathering sources in a single study; therefore, triangulation was employed in this study to develop a "deeper and clearer understanding of the setting and people being studied" (Taylor & Bogden, 1998, p. 80).

The population for this study consisted of three purposefully selected student teachers (from a Southern state) majoring in agricultural education. Selection was based on which student teachers in agricultural education would be student teaching during the 2003-2004 academic school year. In addition, each student teacher was assigned a pseudonym to insure confidentiality of their statements.

Student teachers were instructed on different supervisory models and techniques prior to student teaching. In addition, they were given the Supervisory Options for Instructional Leaders in Education (Fritz and Miller, 2003b) paper as a supervisory reference. After thorough instruction on supervision, student teachers selected their choice of supervision. The choices were clinical, contextual, and differentiated supervision. One student teacher selected clinical, one selected contextual supervision, and one selected cooperative professional development (an option in the differentiated supervision model).

In addition, student teachers compiled and discussed their specific concerns related to teaching. These concerns were referenced against Fuller and Case's (1972) manual for scoring teaching concern statements. The three areas of concerns are: teacher's concern about self as a teacher, teacher's concern about the tasks in teaching, and teacher's concern with the impact of teaching on pupils. Upon completion of student teaching, student teachers filled out a follow-up teacher concern questionnaire to compare if concerns had increased or decreased. The questionnaire consisted of 15 statements related to the teaching process. Student teachers were asked to provide their level of concern on a scale from 1(not concerned) – 5(extremely concerned). Each statement related to either a self, task, or impact concern and were tabulated. The tabulations were then converted to a standard score and plotted on the teacher concern profile. The profile was used to analyze student teacher concerns.

Based upon the work of Barrett (1991), the researcher (s) provided a written explanation of each leadership style (realist, legalist, analyst, and empathist) to the student teacher. Student teachers' were asked to select the explanation that best represented their current leadership style in the classroom.

Two field visits were made to each student teacher. During the field visits, the primary researcher obtained information through classroom observations and interviews with the student teacher. In addition, each teacher participated in a structured interview at the finale of the student teaching experience. On a weekly basis, student teacher reflection journals were collected and analyzed by the researcher (s).

Field notes were recorded and analyzed. Furthermore, in-depth interviews were taped and transcribed. Emerging themes from all data collection were coded and sorted into specific categories by the researcher (s). Once data were placed into specific categories, the constant comparative method (Glaser & Strauss, 1967) was utilized to refine and strengthen ideas to assist researcher (s) in a move to a higher level of conceptualization. In addition, a concept map was developed by the researcher (s) to aide in the understanding of each student teacher's experiences.

Dependability was established by keeping detailed records of the data collected and analysis procedures. To validate specific themes, another researcher familiar with the research practice coded data that yielded 99% agreement with the primary researcher. Member checks were also used to address credibility by mailing student teachers a copy of their interview transcript and a draft copy of the report.

Findings

Billy, Sally, and Fred completed their student teaching during the 2003-2004 academic school year. All three student teachers were extremely nervous and concerned about the student teaching process. In addition, each was petrified about not performing well in the classroom. In the following related topics, each student teacher progresses and develops in his/her own unique way.

Identified leadership style

In the classroom, Billy and Fred both described their leadership style as realists. They both have a laid back style to teaching and were best described as here-and-now leaders. However, Sally described herself as an analyst. Sally thrives on creating innovative lessons and considers herself multi-talented. In addition, Sally is driven by work itself and not by the administration.

Concerns related to student teaching

Billy, Sally, and Fred all expressed concerns prior to the student teaching experience. The concerns expressed by Billy and Fred were primarily self-adequacy concerns. Those concerns identified were discipline problems, controlling the classroom, time management, lesson plan organization, and providing hands-on activities for every subject taught. However, Sally's concerns were expressed as questions and reflected teaching impact concerns. Those questions were: Will students learn from me?, Will I enjoy the next few months?, and Will I be able to make a difference?

The semester can change drastically for individuals. Billy, Sally, and Fred were asked about challenges they were facing approximately six weeks into their student teaching experience. Ironically, Sally's concerns had shifted drastically. She wrote

> Challenges I am facing are discipline problems, student attitude and time management. The students are still testing me and trying to push me over the edge. I sent one of my students to in-school for refusing to do any work and using profanity…I am having

trouble keeping them motivated. Time management…there is never enough time to get everything done.

Similarly, Billy and Fred still had concerns related to time management. Billy felt he procrastinated on staying organized and getting his teaching materials ready prior to the day. In addition, Fred felt he did not have enough time in his day to get all the "things done he needed to." As shown, student teaching can create many challenges for student teachers; however, discipline and time management were predominant concerns among all student teachers.

Table 1 displays post student teacher concern data related to each student teacher. Billy scored the highest on self and task concerns. He appeared to still be concerned with issues related to discipline and developing lesson plans. Sally scored very low on self, task, and impact concerns. Furthermore, Sally appeared to be comfortable dealing with discipline problems, creating lesson plans, and impacting student lives at the finale of the student teaching experience. Fred was still slightly concerned with discipline problems; however, he was not concerned with task or impact issues.

Table 1
Teacher Concern Profile (n=3)

Student Teacher	Self	Task	Impact
Billy	7	7	6
Sally	2	2	1
Fred	4	2	1

Note. Scored ranged from 1-9. 1 represented no concern and 9 represented extreme concern.

Supervisory Model Selection

Student teacher's were permitted to select his/her own supervisory style. Each student teacher was given the choice of clinical, conceptual, developmental, contextual, or differentiated supervision. Billy happily selected clinical supervision. He commented

> The supervision model [clinical supervision] has definitely provided me with numerous alternatives to use when trying to conquer classroom management techniques. I believe having someone that has great knowledge and experience in my field guiding my every move is the only way I can better myself as a future teacher.

Additionally, Billy acknowledged "I definitely need someone to help me along the way." Unlike most student teachers, Billy recognized his weaknesses and wanted strict guidance to improve his teaching abilities. In addition, Billy lacked some of the teaching confidence to self-direct his own teaching improvement.

> It is hard for me to learn stuff on my own and I like having someone I know sitting around me and telling me, you need to do this, you need to do that… that way I have a basis…I know what I need to do and what is expected.

Sally chose contextual supervision because “it allows me to have the freedom to make my own decisions but still have someone to bounce ideas off of.” Furthermore, she set her own goals to be accomplished. Once Sally’s goals were accomplished, she identified new ones to strive for. Based on Sally’s goals and teaching progress, the teacher educator adjusted the type of supervisory assistance given. Sally wrote that “utilizing contextual supervision has helped me organize my class time, lessons, and receive criticism and feedback better. I can evaluate myself better, recognize my faults more than before, and I am open to change.” According to Sally, contextual supervision was the right choice for her. “I liked getting to select our type of supervision…I would not have done as well under more structure or less structure…I think it was just right for me.”

On the other hand, Fred took the extremist approach and selected an option under the differentiated supervision model. The differentiated supervision model suggests four options: intensive development (extended version of clinical supervision), administrative monitoring, cooperative professional development, and self-directed. The option Fred selected was cooperative professional development. Cooperative professional development provided the student teacher the opportunity to be part of a two or three teacher team. The team observed each other teaching and gave feedback as needed. When asked why he selected this method, Fred commented

> For the student teaching process it’s a time to learn, try new things. I thought, why not go to the most open and extreme point and see…I wanted to learn the most, do the most on my own and set up my own system [supervision]…I loved this method of supervision because I got to select my own supervisory team. I picked a math and English teacher, my University Supervisor, and my cooperating teacher.

Fred described his experiences with the supervisory process much different than the other two student teachers. He expressed that he “loved” his choice of supervision and describes the process as an “excellent opportunity”. Additionally, Fred believed this process was the best way to take “large steps in improving as a teacher and I feel little pressure to follow a set path.”

Fred received constructive feedback from members of his supervisory team. The math teacher expressed areas of improvement related to organization skills; the English teacher provided comments related to creating openness with students; and the teacher educator and cooperating teacher provided feedback related to subject matter and teaching delivery. However, the most rewarding principle for Fred was becoming familiar with other professionals in the school.

> You actually get to know and meet other teachers…You get to eat lunch with them and establish more of a common ground. It is an excellent opportunity to talk about, well, I am having trouble with Chris in English but he is doing well in Agriculture Education…How do I adapt or what are you doing different than me?

Fred identified one challenge that emerged from utilizing differentiated supervision, keeping focused and on track. Fred wrote

The only catch to this method is there are no strict guidelines to follow. That means to me if you get off track it is hard to find your way back. Also with the great opportunity to make great leaps in teaching methods, there is also a chance for a set back. However, I feel the gain out weighed the risk.

Preferred Teaching Style

Sally's preferred teaching style is represented in Figure 1. Sally based her teaching style on the moods of students each day. When students appeared to be in a good mood, she conducted an overview of the material. In addition, she supplied students with definitions, lectures and several hands-on activities. Unfortunately, when students expressed foul moods she only utilized a lecture format. Furthermore, the lecture format served as a form of punishment for students.

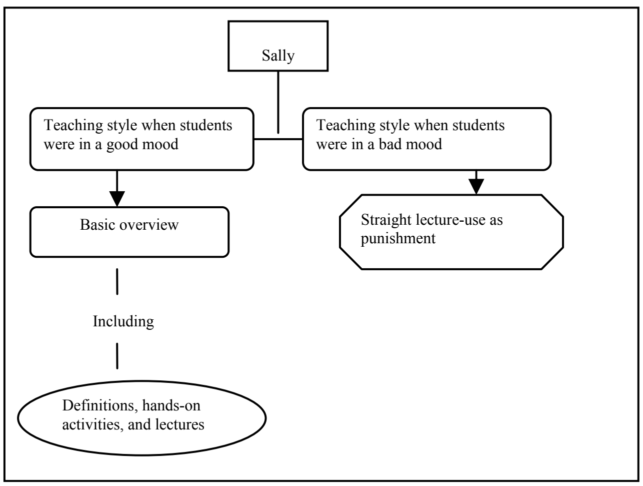

Figure 2. Concept map of Sally's teaching style

Billy preferred the lecture style approach to teaching (Figure 3). In addition, he only felt comfortable teaching the material with which he was familiar. He remarked that he is not a creative thinker; therefore, it is stressful for him to incorporate hands-on learning activities. To insure that students paid attention, he refrained from giving students the notes until lecture was over. However, Billy's teaching style did change slightly over the semester. He began incorporating student-driven lessons into his classes but commented "I still prefer the boring lecture style of teaching".

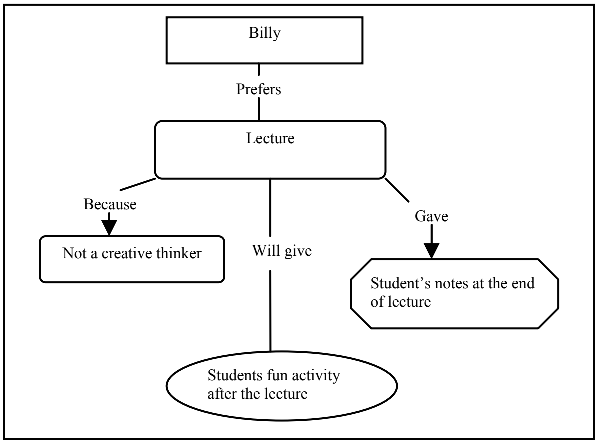

Figure 3. Concept map of Billy's teaching style

Fred, like Sally, based his teaching style on students' mood for that day (see Figure 4). Particularly, if students were in a good mood, the lesson was student-driven. For example, if a student asked a question during note-taking, Fred would stop the lecture and begin a conversation with that student. Additionally, he provided students the opportunity to establish the class environment. Contrary to Sally, when students were in a bad mood, Fred did not punish them. Instead, Fred provided a more structured environment by writing objectives on the board and utilizing a step-by-step process to teach the lesson. This process kept students on track and made it easier for Fred to teach the agricultural content.

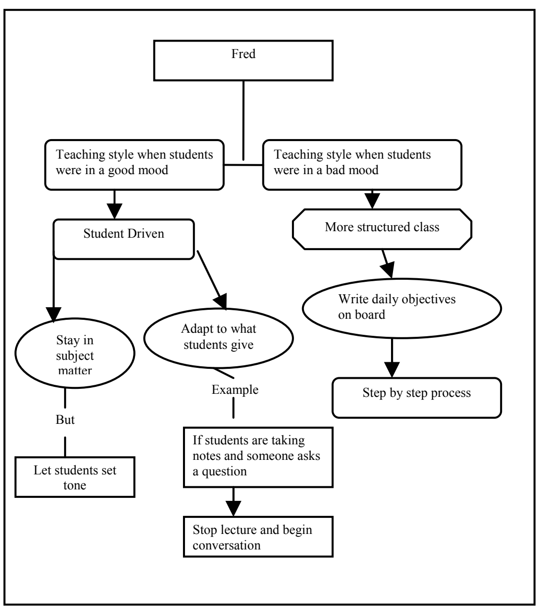

Figure 4. Concept map of Fred's teaching style

Cooperating Teacher Support

Cooperating teacher support provided to the student teacher can vary greatly. Sally had the most difficult experience with her cooperating teacher. Her cooperating teacher was close to retirement and, as she put it, "He's definitely done." The class was completely turned over to her without significant supervision from the cooperating teacher. In addition, she was left to *figure out* school policies, discipline problems, and classroom management. Sally received little input pertaining to what was and was not working as evidenced by her statement.

> I was constantly changing my third period class, trying to find something that would work…I'd spend so much time either explaining something to them [uninterested students] or telling them to shut up and sit down and get on task, that the kids who were interested just got bored.

She did not find anything that worked for her third period class and became frustrated. If her cooperating teacher had been more receptive, Sally may have obtained ideas regarding classroom control.

Billy had a slightly better experience with his cooperating teacher. While the cooperating teacher was still close to retirement and had not implemented any new policies or lesson plans in a few years, he was in the classroom with Billy. However, Billy still received marginal feedback from his cooperating teacher. For example, Billy thought he covered materials thoroughly and wrote accurate tests, but had not received feedback from his cooperating teacher pertaining to these areas. Billy commented

> I went over a nutrition and digestive unit. I thought I'd covered it [the material] pretty well. I made up my own test, gave it to them and I had three out of 26 students pass. It was awful. All I heard was sighs and deep breathing throughout the whole test. Some students just wrote their names on the test and turned it in. They did not even try.

Fred had the best experience with his cooperating teacher. She was present in the classroom, providing feedback as needed. She was structured in nature, but Fred stated the difference in teaching styles was never an issue.

> She did not push me to go more structured. At the end of teaching a lesson, she would evaluate me and point out areas I needed to work on. You need to work on controlling student talking, controlling the focus of the class. She was open to how I was teaching and she recognized that I taught a little bit different then her.

Even though she was notorious for reminding Fred about areas of needed improvement, she did not intervene with Fred's classroom. Fred remarked, "If I was doing well, it was great. If I was doing badly, I was still teaching."

Conclusions

The data gathered from this study were retrieved from three student teachers from a Southern state majoring in agricultural education. The reader is cautioned that the results of this study cannot be generalized to all student teachers but only to the three that participated.

Billy, Sally, and Fred were self-aware. They knew what leadership style they employed in the classroom and could identify concerns they had related to teaching. In addition, they were aware of their strengths, weaknesses, and areas of needed improvement. However, these student teachers were no different than many other student teachers. According to Fuller et. al (1974), the majority of student teachers express concerns related to self and so did Billy, Sally, and Fred. Although Sally began her student teaching with concerns related to impacting students, she quickly became concerned with survival in the classroom. In addition to teaching concerns, these three student teachers struggled with their teaching style. Like most student teachers, they relied heavily on lecture but were incorporating some hands-on activities into the classroom by the end of the semester.

Danielson (1996) affirmed that teachers should have a voice in the supervisory process but many teacher educators do not include student teachers. The majority of agricultural education teacher educators employ clinical supervision with student teachers and this process is very structured (Fritz & Miller, 2003a). However, given the opportunity to select which supervisory model they would receive, two of the three student teachers in this study selected a model different from clinical supervision. One can conclude that these student teachers selected the supervisory model that would augment their professional growth and was appropriate for their current developmental level. While each selected a different approach, the approach selected was appropriate for how they preferred to be led. Most importantly, student teachers had a voice in the supervisory process and were enriched by the experience. As Gardner (1990) stated, the supervisory process that is follower-driven enriches and strengthens an organization. Implications from this study are directly related to teacher education research. Researchers (Danielson, 1996; Glickman, et. al, 2001) argue that the process of supervision and evaluation of teachers should be developmental; however, many teacher educators do not give student teachers a voice in the supervisory process. Providing student teachers the opportunity to be involved in the supervisory process can be risky for the teacher educator but the reward gained can override the risk.

Future research is still needed to answer questions that surfaced from this study. Research should strive to answer the following:

1. What are the long term impacts for student teachers having ownership in the supervisory process?
2. Are student teachers that received the relatively unstructured model of supervision more/less developed as teachers than those that received the structured supervision model?
3. Will student teachers that selected the relatively unstructured supervisory model continue with that type of supervision (e.g. journal writing, seeking out other teachers for input, videotaping their teaching, etc.)?

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A PROFILE OF COOPERATING TEACHERS AND CENTERS IN OKLAHOMA: IMPLICATIONS FOR THE STUDENT TEACHING EXPERIENCE IN AGRICULTURAL EDUCATION

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Abstract

This inquiry is the first systematic study of cooperating teachers' perceptions of the agricultural education student teaching experience in Oklahoma in more than three decades. The sampling frame (N = 64) included cooperating teachers representing 55 student teaching centers. A questionnaire was sent to cooperators via postal mail. The instrument included 13 items identifying selected characteristics of cooperating teachers and centers. In addition, teachers rated 34 elements of the student teaching experience using a Likert-type scale ("5" = "High Importance . . ."1" = "No Importance"); final return rate was 77%. Cronbach's coefficient alpha reliability estimates for five core areas of the student teaching experience ranged from .47 to .87; the overall importance scale yielded an estimate of .93. Respondents rated 33 of 34 elements as having "much importance" or greater (M > 4.00). The highest rated element was "a well rounded program emphasizing instruction, SAEs, and youth leadership activities" (M = 4.92; SD = .34). The core area "Cooperating Teacher-Student Teacher Relationships" accounted for seven of the ten highest rated elements. Recommendations and implications point to the need for greater diversity in cooperating teachers and centers, for instrument re-design as related to the construct of instruction, and for the provision of targeted professional development opportunities for cooperating teachers.

Introduction and Conceptual Framework

Is there a more important component of the preservice professional development of aspiring agriculture teachers than the student teaching experience? Earlier researchers (Barnes & Camp, 2002; Covington & Dobbins, 2004; Deeds, 1993; Deeds, Arrington, & Flowers, 1988; Deeds, Flowers, & Arrington, 1991; Dobbins & Camp 2000; Edwards & Briers, 2001; Harlin, Edwards, & Briers, 2002; Larke, Norris, & Briers, 1992; Roberts & Dyer, 2004) have described important dimensions of the student teaching experience in agricultural education. Deeds collected data from 82 institutions, nationally, that were charged with agricultural teacher education. Larke et al. conducted a national study that queried three groups—teacher educators, supervising teachers, and student teachers. Covington and Dobbins (2004) carried out a nationwide modified Delphi panel consisting of teacher educators and secondary agricultural education teachers to determine a task list for the student teaching experience. Barnes and Camp, Deeds et al. (1991), Dobbins and Camp, Edwards and Briers, Harlin et al., and Roberts and Dyer reported the perceptions of cooperating teachers and/or student teachers representing different states: Florida, Mississippi, North Carolina, South Carolina, Texas, and Virginia.

However, the last systematic study of Oklahoma cooperating teachers regarding their views about important elements of the student teaching experience in agricultural education was conducted more than 30 years ago (Holley, 1972). Arguably, many changes have occurred in secondary agricultural education, in education generally, in the agricultural, food, fiber, and natural resources system, and in American society during the last three decades.

Importance of the Student Teaching Experience

Norris, Larke, and Briers (1990) asserted, "The student teaching center and the supervising (cooperating) teacher are the most important ingredients in the student teaching experience" (p. 58). Moreover, Korthagen and Kessels (1999) argued that a cooperating student teaching center "must be able to offer a sound balance between safety and challenge and a balance between the goal of serving student teachers' learning and the interests of the school" (p. 14). Further, "Priority should be given to selecting cooperating teachers who model the desired teaching behaviors expected of student teachers" (Garton & Cano, 1994, p. 213).

Researchers (Byler & Byler, 1984; Deeds & Barrick, 1986) have identified positive relationships between cooperating teachers' attitudes and morale toward teaching secondary agricultural education and those held by preservice students following their field experiences. DeMoulin (1993) maintained that, "students should exhibit positive changes in attitude toward teaching and come away from the student-teaching experience with a positive attitude toward their chosen profession" (p. 160).

Martin and Yoder (1985) framed a successful student teaching experience as one in which a "team approach" (p. 19) exemplified the cooperating teacher-student teacher relationship, including a supervisory "climate" devoted to using a clinical teaching analysis model. The researchers contended that "success of the individual student teacher depends, to a very great extent, upon the general supervisory climate in the department and on the educational leadership abilities of the cooperating teacher" (p. 21). Martin and Yoder concluded that, "Supervision of student teachers represents an important responsibility" (p. 21). Many teacher educators opine that it is a responsibility demanding diligent and sustained inquiry.

Conceptually, this study is supported by Ajzen's (1991) work describing the role of beliefs in human behavior. In particular, the construct of *belief salience*, i.e., "a relation between a person's *salient* beliefs about the behavior and his or her attitude toward that behavior" (p. 192) exists and therefore informs one's perceptions. Accordingly, it was posited that cooperating teachers' perceptions are valid reflections of their attitudes regarding importance of selected elements of the student teaching experience. But what are Oklahoma cooperating teachers' perceptions of important elements of the student teaching experience in agricultural education?

Purpose and Research Questions

The two-fold purpose of this study was to describe what cooperating teachers perceived to be important elements of the student teaching experience, and to identify selected characteristics of cooperating teachers and centers. The following research questions guided this study: 1) What do cooperating teachers' perceive to be important elements of the student teaching experience in agricultural education? 2) What are selected personal, professional, and school setting characteristics of cooperating teachers?

Methods and Procedures

This descriptive study sought to describe cooperating teachers' perceptions of important elements of the student teaching experience, and to identify selected characteristics of cooperating teachers and centers. The study's sampling frame (N = 64) included teachers and schools who had either served as cooperating student teaching centers previously or who were future placement sites for student teachers from Oklahoma State University; thus it was a purposive sample. Potential cooperating teachers and centers were derived from a list based on established selection criteria as well as input received annually from potential cooperators—teachers and their principals,—selected state staff members, and teacher education faculty.

The data collection instrument was developed by Edwards and Briers (2001) for use with agricultural education cooperating teachers in Texas. These researchers used cooperating teacher focus groups to identify 34 elements of the student teaching experience per five "core" areas derived from a review of literature (Briers & Edwards, 1998; Edwards & Briers, 1999; Larke et al., 1992; Martin & Yoder, 1985). Items were validated further via a postal mail questionnaire follow-up procedure (Edwards & Briers, 2001).

Part one of the instrument was divided into five "core" areas of the student teaching experience and included 34 "important elements": classroom and laboratory instruction (5 items; α = .47), supervised agricultural experience programs (SAEPs) (4 items; α = .61), student leadership development (FFA) (7 items; α = .85), school and community relationships (9 items; α = .83), and cooperating teacher-student teacher relationships (9 items; α = .87). Teachers were asked to indicate their perceived "level of importance" for the elements using a Likert-type rating scale: "5" = "High Importance," "4" = "Much Importance," "3" = "Some Importance," "2" = "Low Importance," and "1" = "No Importance." Cronbach's coefficient alpha reliability estimates for the five core areas ranged from .47 to .87; the overall importance scale yielded an estimate of .93. Part two of the instrument included 13 items identifying selected characteristics of cooperating teachers and centers. The instrument was modified slightly to reflect Oklahoma school setting characteristics and teachers.

Cooperating teachers were postal mailed a research packet during the spring of 2004 that included a cover letter explaining the study, a questionnaire, a pre-coded scan sheet, and a return envelope coded to determine non-respondents. Following a two-week waiting period, non-respondents were contacted and encouraged to return their questionnaires. Teachers who requested another research packet were mailed one. After a similar waiting period, a third mailing of research packets containing a slightly altered cover letter was mailed to remaining non-respondents (Dillman, 1978; Tuckman, 1999).

The final rate of return—deemed to be acceptable (Tuckman)—was 77% (49 of 64) for the cooperating teachers representing 55 cooperating student teaching centers. To address the possibility of nonresponse bias, teachers who responded more than one week after receipt of the first return were operationalized as "late respondents" (23) per recommendation of Lindner, Murphy, and Briers (2001). This procedure permitted a near 50-50 split of early and late responders thus improving the power of statistical comparison (Lindner et al.). Accordingly, independent samples *t*-tests were used to compare the two groups; no significant differences (p<.05) were detected for the variables of interest. However, caution is urged when attempting to generalize the study's findings beyond the responding sample. The *Statistical Package for the Social Sciences v. 11.0.* was used for data analysis. Research questions were analyzed descriptively with frequencies, percentages, means, and standard deviations; a ranking of the important elements was determined as well.

Findings

As shown in Table 1, cooperating teachers who participated in this study were mostly male; only three of the respondents were female. About two-thirds (33) of the teachers held only a Bachelor's degree; the remainder had earned a Master's degree. One-fourth (12) of the

Table 1
Selected Characteristics of Cooperating Teachers (N=47[a])

Characteristics	Frequency	Percentage
Gender		
Male	44	88
Female	3	6
Highest Degree Held		
Bachelor's	33	66
Master's	14	28
Teaching Certificate(s) Held in Other Areas[b]		
No other teacher certification	29	58
Yes, in general science	7	14
Yes, in life-earth science	1	2
Yes, in fields other than those above	4	8
Interested in a Graduate Degree		
Definitely not	9	18
Probably not	16	32
Unsure	5	10
Probably yes	14	28
Definitely yes	3	6
Years Taught Agricultural Education		
3 - 5 years	3	6
6 - 10 years	8	16
11 - 15 years	6	12
16 or more years	30	60

[a]Two respondents did not provide demographic data about themselves. [b]Six respondents did not answer this question.

cooperating teachers held teaching certification(s) in other areas. Six-in-ten respondents (30) had 16 or more years of experience as an agricultural education teacher.

Regarding selected characteristics of cooperating student teaching centers, 44 of the centers reported campus enrollments of 618 or fewer students; the remainder were larger schools (Table 2). A slight majority of centers (26) had two or more classrooms in their agricultural education departments. The most common laboratory facility was for teaching agricultural mechanics (46). Slightly more than one-half (27) of the cooperating centers had a greenhouse or some other facility for teaching horticulture. A similar number of schools (26) had a project center/feeding facility to support students' livestock SAEs. About one-in-four centers (14) had a land laboratory but very few (2) had an aquaculture facility (Table 2).

Table 2
Selected Characteristics of Cooperating Student Teaching Centers (N=47[a])

Characteristics	Frequency	Percentage
Size of School		
< 132 students	10	20
132 - 363 students	20	40
365 - 618 students	14	28
659 - 1229 students	1	2
1275 - 4279 students	2	4
Number of Agricultural Education Classrooms		
1	20	40
2	18	36
3	8	16
Ag Mech Laboratory (Yes)	46	92
Greenhouse (Yes)	21	42
Other Hort. Facility (Yes)	6	12
Aquaculture Facility (Yes)	2	4
Land Laboratory (Yes)	14	28
Project Center/Feeding Facility (Yes)	26	52

[a]Three respondents did not provide data about their schools.

Cooperating teachers' mean ratings of 34 "important elements" of the student teaching experience are shown in Table 3. Teachers rated elements (items) of the student teaching experience on level of importance ("5" = "High Importance" . . . "1" = "No Importance") via a mail questionnaire; all but one of the 34 items were perceived to have either "much" or "high importance" (M > 4.00) (Table 3). The overall mean was 4.49 or midway between "much" and "high importance."

The highest rated element was "a well rounded program emphasizing instruction, SAEs, and youth leadership activities" (M = 4.92; SD = .34). "A cooperating teacher who has a positive attitude" was the second highest rated element (M = 4.90; SD = .31), while the element "a cooperating teacher who is a 'good' role model" was rated third (M = 4.88; SD = .39). Three

Table 3
Cooperating Teachers' Perceptions of the Important Elements of the Student Teaching Experience (N=49)

Elements[a]	*M*[b]	*SD*	Ranking
Classroom and Laboratory Instruction			
Daily (systematic) classroom and/or laboratory instruction	4.63	.61	11
A discipline management plan is used in a structured environment	4.69	.55	8
Current technology used in instruction	4.27	.73	25
Creative teaching methods as a basis for daily instruction, e.g., use of multimedia and varied teaching techniques	4.22	.69	27
A well-rounded program emphasizing instruction, SAEs, and youth leadership activities	4.92	.34	1
Composite Mean[c]	**4.55**		
Supervised Agricultural Experience Programs			
All students meeting state SAE requirements, with accurate record books	3.90	.71	34
Diversity within the students' SAEs	4.00	.74	33
Project supervision and an explanation of this commitment to the student teacher	4.55	.58	14
Student participation in advanced awards and degrees on district, state, and national levels	4.37	.73	20
Composite Mean[c]	**4.35**		
Student Leadership Development (FFA Activities)			
Strong classroom instruction in student leadership development	4.49	.55	15
These activities as essential for a balanced program	4.49	.65	16
A history of successful participation	4.06	.80	32
Cooperating teachers who are familiar with current rules for participation in events (e.g., CDEs)	4.33	.69	22
Cooperating teachers who delegate the training of at least one team to the student teacher	4.27	.73	26
Resources available to train a competitive team	4.41	.73	19
Opportunities for the student teacher to judge or monitor a district or state CDE	4.22	.77	28
Composite Mean[c]	**4.32**		
School and Community Relationships			
Recognized integrity of the cooperating teacher	4.73	.57	7
Departmental support organization(s) (e.g. , advisory committees, booster clubs, and Alumni)	4.33	.66	21
A cooperating teacher who supports other school activities (e.g., athletic events)	4.12	.75	31
A cooperating teacher who supports activities in the community (e.g., service organizations)	4.57	.58	12
A spirit of professional cooperation among fellow teachers	4.57	.61	13
Use of local media	4.27	.61	24
School administrators who are involved in program activities	4.18	.70	29

Elements[a]	M^b	*SD*	Ranking
School and Community Relationships (con'd)			
Community service projects	4.33	.69	23
Availability of facilities (e.g., computer lab, shops, horticultural lab, school farm)	4.41	.67	18
Composite Mean[c]	**4.39**		
Cooperating Teacher-Student Teacher Relationships			
A cooperating teacher who is willing to be a mentor	4.85	.41	5
A student teacher who is willing to be mentored by the cooperating teacher	4.86	.41	4
A cooperating teacher who has a positive attitude	4.90	.31	2
A cooperating teacher who is a "good" role model	4.88	.39	3
A cooperating teacher who communicates clear expectations to the student teacher (e.g., role in classroom and calendar of events)	4.84	.43	6
A cooperating teacher who provides frequent evaluations and feedback to the student teacher	4.67	.56	10
Discipline policies that are in place and enforced	4.67	.52	9
"Reinforcement" techniques in teaching (e.g., pace, reteaching, retesting, and accommodation of various learning styles)	4.49	.65	17
Assistance in job placement	4.17	.75	30
Composite Mean[c]	**4.71**		
Overall Mean	**4.49**		

[a]Important elements were derived from an earlier study (Edwards & Briers, 2001). Items were modified slightly to reflect Oklahoma secondary agricultural education. [b]5 = High Importance to 1 = No Importance. [c]Composite mean of elements for that core area.

elements belonging to the core area "Cooperating Teacher-Student Teacher Relationships" were rated fourth, fifth, and sixth in importance; the items were separated by .01, respectively (*M* = 4.86; 4.85; 4.84) (Table 3). "Recognized integrity of the cooperating teacher and program" (*M* = 4.73; *SD* = .57) was rated the seventh most important element. In eighth place was the element "a discipline management plan is used in a structured environment" (*M* = 4.69; *SD* = .55). And, the element "discipline policies that are in place and enforced" (*M* = 4.67; *SD* = .52) tied for ninth with "a cooperating teacher who provides frequent evaluations and feedback to the student teacher" (*M* = 4.67; *SD* = .56). Of the remaining elements, 17 had mean importance ratings ranging from 4.63 to 4.27, while seven items had mean rating scores approaching "much importance" (*M* < 4.25). Only one of these elements was rated below "much importance": "all students meeting state SAE requirements, with accurate record books" (*M* = 3.90; *SD* = .71).

The 34 elements were grouped conceptually into five "core" areas, and a "composite" mean was computed for each area (Table 3). The core area "Cooperating Teacher-Student Teacher Relationships" (9 elements) accounted for seven of the ten highest rated elements. Accordingly, this core area had the highest composite mean (4.71). "Classroom and Laboratory Instruction" (5 elements) was second highest (*M* = 4.55), and the core area "School and Community Relationships" (9 elements) had the next highest composite mean (*M* = 4.39). The core areas "Supervised Agricultural Experience Programs" (4 elements) and "Student Leadership

Development (FFA Activities)" (7 elements) had the second lowest and lowest composite means (4.35 and 4.32, respectively).

Conclusions, Recommendations, and Implications/Discussion

Instructors selected by Oklahoma State University to serve as cooperating teachers in agricultural education were primarily males who were experienced teachers. Less than one-third of the respondents held a master's degree. Most cooperating teachers were employed in schools with moderate to small enrollments. Centers included classrooms dedicated to agricultural education and, in most cases, laboratories for teaching agricultural mechanics. Facilities to support other parts of the agricultural education curriculum were less common.

Respondents rated 33 of 34 elements of the student teaching experience as having "much importance" or greater ($M > 4.00$). As a core area, respondents held greatest importance for elements of "cooperating teacher-student relationships," even more so than "classroom and laboratory instruction," which was rated second. The element "a well-rounded program emphasizing instruction, SAEs, and youth leadership activities" received the highest rating overall. Teachers' perceptions about selected aspects of students' SAEs ranked lowest (Table 3).

Cooperating teachers' recognition of importance of the cooperating teacher-student relationship supported the position of Martin & Yoder (1985). Further, because teachers stressed selected elements of this core area, i.e., "positive attitude" and being a "'good' role model" were the second and third highest ranked items, earlier work by Byler and Byler (1984) and Deeds and Barrick (1986) was also supported. However, contrary to Edwards and Briers (2001), who found that Texas cooperating teachers held the core areas "classroom and laboratory instruction" and "cooperating teacher-student relationship" to be equal in importance, Oklahoma teachers perceived the latter to be the most important core area of the student teaching experience.

Recommendations for Future Practice

1) Albeit the current pool of potential female cooperators in Oklahoma is small, teacher educators should strive to identify and develop more centers staffed by female agricultural education teachers for the purpose of future student teacher placements.

2) Teacher educators should identify and use cooperating centers for student teacher placement that offer facilities supporting the teaching of a diverse agricultural education curriculum, including horticulture, aquaculture, animal science, and environmental science. Cooperating centers that offer only one or two laboratory experiences should be encouraged to diversify.

3) Teacher educators should continue to encourage current and future cooperating teachers to pursue graduate education (e.g., a master's degree) supporting their role as a cooperating teacher and as an agricultural education teacher. Teacher education faculty in agricultural education should continue to offer graduate course work in residence and at a distance to support the professional growth of this audience.

Recommendations for Future Research

1) Student teachers should be queried about their perceptions of important elements of the student teaching experience (Edwards & Briers, 2001; Harlin et al., 2002; Roberts & Dyer,

2004). Then, findings compared to cooperating teachers' perceptions in an attempt to better understand different as well as similar perceptions held by these two key stakeholder groups. Other significant groups could be included as well, e.g., members of the Oklahoma state staff for agricultural education and selected teacher educators. Areas of disagreement may generate additional research questions about important elements of the student teaching experience.

2) More research should be conducted to determine why cooperating teachers perceived that the cooperating teacher-student teacher relationship was the most important core area even more so than classroom and laboratory instruction. A deeper understanding of cooperating teachers' rationale for this perception may better inform teacher educators who are charged with preparing preservice students for the student teaching experience. Qualitative methodologies, e.g., focus groups and semi-structured interviews, may be effective tools for that purpose.

3) The finding that the two lowest rated important elements were drawn from the same core area—"Supervised Agricultural Experience Programs"—warrants further study, especially as it relates to how cooperating teachers assist students in meeting state SAE requirements, importance of accurate record books in that process, and their views about diversification of students' SAE opportunities (Baggett-Harlin & Weeks, 2000).

Implications/Discussion

This inquiry is the first systematic study of cooperating teachers' perceptions of the agricultural education student teaching experience in Oklahoma in more than three decades (Holley, 1972). It shed valuable light on cooperating teachers' perceptions of important elements of the student teaching experience (Table 3). The finding that teachers rated a comprehensive program of agricultural education, i.e., one "emphasizing instruction, SAEs, and youth leadership activities" as the most important element of the student teaching experience was encouraging.

However, further analysis of data revealed significant variability among cooperating teachers' perceptions about the role of instruction, especially as it related to the use of instructional technology and creative teaching methods; these elements were ranked 25 and 27, respectively. What is more, because the reliability estimate for the core area in which these items were nested was low ($\alpha = .47$) leads one to question how respondents operationalized them in the context of classroom and laboratory instruction. (Findings by Edwards and Briers in 2001 with Texas cooperators using the same instrument revealed a similar lack of internal consistency for this construct.) Accordingly, cooperating teachers should be probed further about the role of these behaviors and their related ability to provide effective mentoring. Moreover, it appears that a reconfiguring of the study's instrument is in order to more accurately surface cooperating teachers' perceptions of classroom and laboratory instruction as well as to describe the importance of instructional technology and creative teaching behaviors.

Baggett-Harlin and Weeks (2000) reported inconsistencies among Oklahoma agricultural education programs regarding level of student SAE participation as well as completion of SAE record books. Other researchers (Dyer & Osborne, 1995) have noted serious challenges and deficits related to implementing SAEs and some have called for substantial reconfiguring of how SAEs are operationalized (Baggett-Harlin & Weeks; Camp, Fallon, & Clarke, 1999; Retallick, 2003) in agricultural education. Although viewed as important, this inquiry found that cooperating teachers perceived selected aspects of students' SAEs were the least important elements of the student teaching experience. This may be additional evidence that the "profession's" view of SAE and its role in today's agricultural education model (Retallick) is in a "state of flux," conceptually and, perhaps, philosophically. Accordingly, teacher educators should provide professional development opportunities to assist cooperating teachers in reconfiguring and expanding their views regarding SAEs per recommendations of Camp et al., Dyer and Osborne, Retallick, and others.

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CAREER DECISIONS OF PRESERVICE AGRICULTURAL EDUCATION TEACHERS: A SYNTHESIS OF RESEARCH

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Abstract

This study synthesized research in agricultural education and other related disciplines to better understand the factors that contribute to preservice students' decisions to pursue a teaching career in agricultural education. Preservice students who chose to teach were found to perform academically as well or better than their peers who elected not to teach. This study extends the search for career decision literature to include research related to the Social Cognitive Career Theory (Lent, Brown, & Hackett, 1994). SCCT appears to be an ideal theory for explaining the development of career interests and decisions in agricultural education graduates because it focuses on specific mechanisms (self-efficacy, outcome expectations, and goals) that shape interests and choices related to entry into the profession. SCCT may provide a basis for further research and greater understanding of the decision-making process of preservice agricultural teachers. Several research recommendations are provided to guide future studies.

Introduction/Theoretical Framework

The agricultural education community envisions "a world where all people value and understand the vital role of agriculture, food, fiber, and natural resource systems" (National Council for Agricultural Education, 1999, p. 3). In order to reach this vision, the strategic plan for Agricultural Education calls for an abundant supply of highly motivated, well-educated teachers. However, for at least the last 37 years, agricultural education has suffered from a shortage of qualified candidates to accept teaching positions (Camp, Broyles, & Skelton, 2001). In 2001, 67 agricultural teaching positions went unfilled nationwide and 35 agricultural programs were closed due to the lack of a qualified teacher candidate. Similarly, in 1995 and 1998, respectively 41 and 55 departments did not operate after failing to hire a qualified agricultural teacher (Camp et al., 2001).

Although the shortage of qualified teacher candidates has been a continual problem (Camp et al., 2001), the agricultural education literature provides little explanation of the factors that contribute to the teacher shortage. Related research in agricultural education has primarily focused on follow-up studies of recent agricultural education graduates. A few researchers have proposed possible solutions for the shortage; however these studies have not resulted in further investigation. Results of graduate follow-up studies have shown that those who entered teaching were as academically able or more so than their peers who chose not to teach. Graduates who entered the teaching profession were found to have higher cumulative grade point averages and higher grades in student teaching and professional education coursework (McCoy & Mortensen, 1983; Baker & Hedges, 1991). Muller and Miller (1993) found agricultural education graduates entering the teaching profession to be no less academically able than their colleagues who chose to seek employment in other professions.

Cole (1984) concluded that teacher educators and teacher preparation programs can have the greatest impact on improving agriculture teacher placement and retention by ensuring quality student teaching experiences, quality professional and technical preparation, and by reducing specific concerns pertaining to negative outcomes associated with teaching agriculture. Graduates mentioned concerns such as spousal support, low salary, long hours, and time for hobbies and recreation (Cole, 1984).

The career decisions of female preservice agriculture teachers may be influenced by their perceptions of barriers created by gender discrimination. Foster, Pikkert, and Husman (1991) found gender bias to be a definite deterrent to women considering a career in agricultural education. In a nationwide survey of 579 female agriculture teachers, Foster (2001) found 61.7% reported experiencing barriers or challenges due to their gender. When asked the greatest barrier faced by female agricultural education teachers, the most common response was "acceptance by peers and other males in industry" (Foster, 2001, p. 392).

In 1979, Parmley, Brown, and Warmbrod examined data from previous national supply and demand studies and concluded that the teacher shortage in agricultural education was not a result of a shortfall in the number of graduates from teacher preparation programs, but rather too few of those graduates choosing to enter the teaching profession. Brown (1995) supported this conclusion finding that approximately half of agricultural education graduates were electing not to pursue teaching positions. Brown (1995) found that there were ample numbers of graduates; however the problem lied in insufficient recruitment of those qualified graduates into the profession. Camp et al. (2001) reported that the percentage of newly qualified agricultural education graduates entering the teaching profession between 1994 and 2001 ranged from 48.4% to 63.8%. The remaining proportion of graduates sought employment outside agricultural education while teaching positions went unfilled.

Although these studies provided valuable information, additional research is needed to better understand the career decision-making process of preservice agricultural teachers. Related research and theories from other disciplines need to be explored to help expedite this process, one such theory served as the basis for accomplishing the objectives of this study.

Objectives

The primary objective of this investigation was to synthesize the research related to the Social Cognitive Career Theory (SCCT) as posited by Lent, Brown, and Hackett (1994). The second objective was to identify SCCT research that may provide further insight into the career decision-making process of preservice agricultural education teachers.

Procedures

The researcher utilized numerous information sources to accomplish the objectives of this study. These sources were identified through the ERIC Documentation Reproduction Service, Journal of Agricultural Education, Journal of the American Association of Teacher Educators in

Agriculture, and the library database at a major land-grant institution. Sources were located using keyword searches, including, but not limited to the following: career barriers, career choice, career decision, career goals, preservice teachers, self-efficacy, Social Cognitive Career Theory, teacher efficacy, outcome expectations, and teacher placement.

Findings

In 1994, a theory emerged that may provide a means for further study of the processes and challenges that agricultural education graduates face when making the decision to enter the teaching profession. The SCCT (Lent et al., 1994) outlines a process whereby people form academic and occupational interests, make academic and career choices, and achieve in their educational and vocational pursuits. This theory may be important to understanding the factors that most significantly influence the career-choice decisions of agricultural education graduates because of its emphasis on the reciprocal interaction of environmental factors, personal factors, and an individual's behavior.

The SCCT represents an effort to understand the processes through which people develop interests, make choices, and achieve varying levels of success in academic and occupational pursuits (Lent et al., 1994). The SCCT stems primarily from Bandura's (1986) general Social Cognitive Theory (SCT). Bandura views individuals as dynamic self-systems capable of exercising personal agency, not merely as simple reactive beings (Rasheed, 2001).

Figure 1 depicts the model hypothesized by Lent et al. (1994) to explain the development of career and academic interests over time, participation in career and academic activities, and

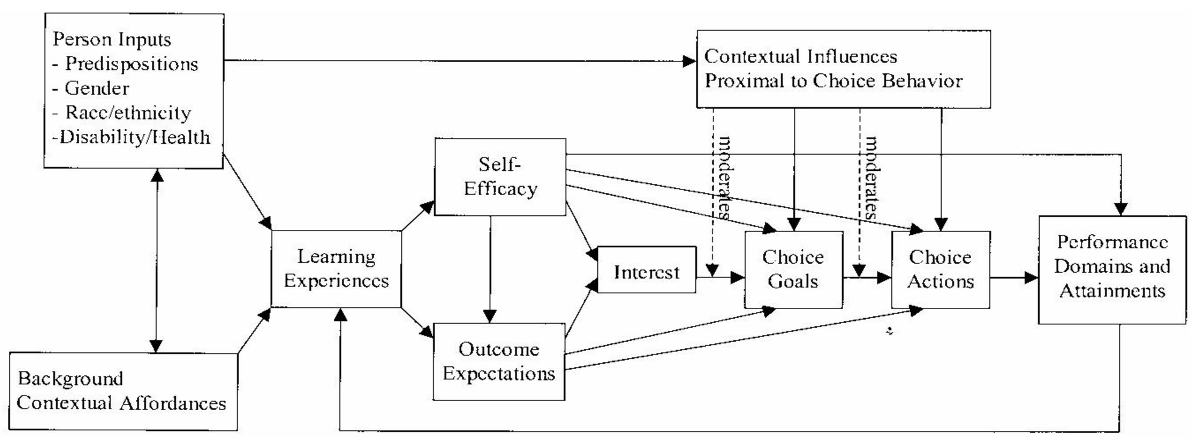

Figure 1. Model of person, contextual, and experiential factors affecting career related choice behavior (Lent et al., 1994).

the acquisition of career related skills. In the model, Lent et al. (1994) assert that throughout childhood and adolescence, people are exposed to a wide array of activities that have potential career relevance. Additionally, they are exposed vicariously to various tasks related to potential occupations. During this period of life, individuals are differentially reinforced for pursuing certain activities and for their performance. Lent et al. (1994) believe that with continued engagement in activities, modeling, and given feedback from others, children and adolescents will begin to refine their skills, form their own performance standards and perceptions of their level of efficacy, and develop expectations about the outcomes of their performance.

The SCCT framework presents three social cognitive mechanisms as the most relevant to career development: (1) self-efficacy, (2) outcome expectations, and (3) goals (Lent et al., 1994). These three factors are the central core of the SCCT model through which individuals develop, pursue, and modify their career interests. The Lent et al. (1994) model hypothesizes that both self-efficacy beliefs and outcome expectancies predict career interests. This is based on Bandura's (1986) assertion that interests arising from activities are more likely to persist over time when the person feels they are effective and successful in completing those activities. Likewise, when an individual believes the outcome of an activity will not be positive, they will tend to lose interest in that activity (Sharf, 1996). These interests, together with a person's perceptions of efficacy and outcome expectancies lead to goal formulation. The goals an individual sets affect their actions, or in this case, career decisions (Lent et al., 1994; Smith & Fouad, 1999). These decisions result in various performance accomplishments and/or failures, which affect an individual's learning experiences, thus creating a cyclical path in the model (Sharf, 1996). In 2000, Lent and colleagues further contributed to the model by providing a better understanding of the impact contextual influences, such as support systems and barriers, had on career development. The following sections will provide a more detailed explanation of the theory and a review of the scholarly literature related to the constructs within SCCT model.

Self-Efficacy

Self-efficacy is a dynamic set of self-beliefs that are specific to a domain and continually interact in a complex manner with other personal, behavioral, and contextual factors (Lent et al., 1994). Numerous studies incorporating self-efficacy have significantly contributed to our understanding of the career development process. However, the recent introduction of the SCCT has caused researchers to examine the interaction between efficacy beliefs and the other contextual and individual variables that influence the career development process (Rasheed, 2001).

In 1981, Betz and Hackett extended Bandura's (1977) self-efficacy construct into career development theory. Betz and Hackett (1981) found that the level of self-efficacy of women was relative to the traditional nature and range of careers they considered viable. Hackett (1985) later made the argument that self-efficacy was more important than a student's actual ability in their decision of a math or science related major. In general, research has shown a wider range of career options and a greater interest in those options was exhibited by those persons with a higher perceived efficacy to fulfill educational requirements and job functions (e.g. Betz & Hackett, 1981; Rasheed, 2001).

In addition to the research conducted in the math and science domains, many other studies have linked self-efficacy with numerous career-related variables, such as career exploration (Rasheed, 2001), career-choice making indecision (Taylor & Betz, 1983), career salience (Matzeder & Krieshok, 1995), specific occupational tasks (Rooney & Osipow, 1992), vocational interests based on inventory instruments (Betz, Harmon, & Borgen, 1996), and academic performance (Betz & Luzzo, 1996).

In the teaching profession, teacher efficacy has continually been found to have a positive relationship with a teacher's performance, commitment to the profession, and ultimately, student achievement. Miller, Kahler, and Rheault (1989) found motivated and confident teachers were more effective. Students achieved more, exhibited greater motivation, and had a higher level of perceived self-efficacy when their teacher possessed a higher level of perceived teacher efficacy (Guskey & Passaro, 1994).

Teacher efficacy has also been examined and found to affect teachers' level of professional commitment and teacher attrition. Knobloch and Whittington (2002) found novice agriculture teachers with teaching and student teaching experience were more confident than teachers who lacked such experience. Links have been found between low levels of teacher efficacy and increased stress, lack of coping abilities, and burnout (Chwalisz, Altmaier, & Russell, 1992; Bandura, 1997). As a means of coping with stress, teachers may avoid engagement in certain instructional activities (Bandura, 1997). Ultimately, teachers who have a low sense of instructional efficacy show a weak commitment to the teaching profession (Evans & Tribble, 1986), they spend less time teaching the subject areas in which they feel less efficacious (Enochs & Riggs, 1990), and dedicate less total time to academic matters (Gibson & Dembo, 1984).

Outcome Expectations

Outcome expectations are personal beliefs about probable response outcomes. That is, where self-efficacy beliefs are concerned with one's perceived abilities to complete tasks or activities (i.e. "can I do this?"), outcome expectations involve the perceived consequences of actually performing the activity (i.e. "if I do this, what will happen?") (Lent et al., 1994, p. 83).

People act not only on their beliefs about what they are capable of doing but also on their beliefs about the likely effects of their actions (Bandura, 1986). Although both self-efficacy and outcome expectations are seen as influencing career related behavior, Bandura (1986) has argued that these two factors are often differentially potent, with self-efficacy being the most influential in determining behavior (Lent et al., 1994).

Although few studies have focused on outcome expectations and career related behavior, research has provided significant findings supporting Lent and colleagues' (1994) hypothesized relationship of outcome expectations to formation of interests, intentions, and setting of goals (Diegelman & Subich, 2001). Betz and Voyten (1997) found that career decision-making efficacy and outcome expectations were good predictors of undergraduates' academic and career indecision, and intentions to engage in career exploration. Fouad and Smith (1996) also found results supporting the SCCT model. Their analysis showed a strong association existed between self-efficacy and outcome expectations. Additionally, outcome expectations were found to be strongly associated with career exploration intentions.

Mixed support for the SCCT model was provided by Schaffner and Jepsen's (1999) study of a minority teacher recruitment program. Outcome expectations and interests were both found to have a direct effect on choice behavior; however the negative relationship found in the study contradicted the positive relationship hypothesized by the SCCT.

Goal Mechanisms

Through the process of setting goals, people organize and guide their own behavior in order to increase the likelihood that desirable outcomes can be attained (Lent et al., 1994). Goals function principally through a person's ability to symbolically represent desired future outcomes and to react to their own behavior in a self-evaluative manner based on their own internal standards for performance. The self-motivating qualities of goals are achieved by linking self-satisfaction to goal fulfillment and by enacting those behaviors that are consistent with a person's internally set standards (Lent et al., 1994).

According to Bandura (1986), setting a goal does not automatically activate the self-influence mechanisms that govern an individual's behavior. Certain goal properties exist that affect an individual's performance towards achieving that goal. Bandura (1986) referenced three factors that have the greatest affect on the motivating nature of goals: specificity, challenge, and proximity.

Career goals and aspirations have been given limited attention in the career development literature and are practically devoid in the agricultural education literature. Much of the research conducted in this area has been focused on identifying potential barriers to career goals. Perceptions of barriers to career goals have been shown to differ based on an individual's gender and ethnicitiy. Perrone, Sedlack, and Alexander (2001) examined barriers to and facilitators of career goals among college students within the context of the SCCT. In a sample of 2,743 college freshman, they found that gender and ethnicity differences existed in the perception of barriers to career goals and aspirations. McWhirter's (1997) study of 1,139 high school students demonstrated that females anticipated more barriers to career goals than did males, and that Mexican Americans anticipated more barriers than European American participants.

Self-efficacy mediates the relationship between ability and women's aspirations to advance in their chosen career field (Nauta, Epperson, & Kahn, 1998). These higher-level aspirations may be influenced by role models as well. Role models affect aspirations by increasing self-efficacy and by vicariously demonstrating how they can perform multiple life roles (Nauta et al., 1998). These researchers also conclude that self-efficacy is an important predictor of higher-level career aspirations and they suggest that interventions can be designed to increase students' self-efficacy (Nauta et al., 1998).

Person Inputs

In an effort to further elaborate on the role of the three sociocognitive mechanisms of self-efficacy, outcome expectations, and goal mechanisms, Lent et al. (1994) present a more comprehensive account of the career development process by addressing other important model components, such as person inputs. A vast array of career-relevant person inputs exist that can have an impact on the career-choice process. These inputs include, but are not limited to, gender, ethnicity, socioeconomic status (SES), genetic predispositions, and disability or health status (Lent et al., 1994). Lent et al. (1994) view person inputs as being linked to the learning experiences that shape an individual's beliefs of self-efficacy and outcome expectations. These personal characteristics have been found to have a direct effect on self-efficacy and outcome expectations (Fouad & Smith, 1996) and an indirect effect through their influence on learning experiences (Lopez, Lent, Brown, & Gore, 1997). Gender and cultural factors may further influence career development by their affect on people's view of and attempts to implement their goals (Lent, Hackett, & Brown, 1996).

Gender and ethnicity have been found to relate to self-efficacy, outcome expectations, interests, and career choice in a number of ways. According to SCCT, gender and ethnicity differences arise primarily through differential access to opportunities, supports, and socialization processes (Lent et al., 1994). Differential access influences career development and career choices by mediating a person's learning experiences. The consequences of these learning experiences give rise to one's self-efficacy and outcome expectations (Lent et al. 1994).

Although largely ignored in the career literature, SES has been found to have an influence on an individual's choice of academic endeavors and the amount of education they expect to achieve (Hanson, 1994; McWhirter, Hackett, & Bandalos, 1998; Trusty, 1998). Bandura (1997) concluded that by affecting parental and family efficacy beliefs, SES indirectly influences the support structure for children's educational development and aspirations. Parents and family's sense of efficacy and aspirations raise their children's educational aspirations and in doing so, raise the child's own academic, social, and self-regulatory self-efficacy (Bandura, 1997).

Contextual Influences

In addition to person inputs, environmental influences also influence career-choice behavior. Lent et al. (1994) posited that contextual factors have an impact on self-efficacy and outcome expectations indirectly through their affect on an individual's learning experiences. Contextual factors affect the socio-cognitive mechanisms that drive a person's interests and career choices and comprise the opportunity structure in which an individual forms and implements their career plans (Lent et al., 1994; Swanson & Woitke, 1997). Additionally, certain environmental factors may also have a direct effect on choice formation and implementation.

For conceptual convenience, Lent et al. (1994) divided contextual influences into two subgroups. They base this division on the proximity of influence to career-choice points: (1) more distal, background influences, and (2) proximal influences. Background influences are those that influence the learning experiences through which self-efficacy and outcome expectations are developed, such as exposure to tasks or role models, the nature of support or discouragement one receives for engaging in activities, and cultural and gender socialization. Proximal influences are those that operate during the critical choice junctures. These include support systems, such as personal network contacts, and structural barriers, such as discriminatory hiring practices (Lent et al., 1994). According to the model, a person is less likely to translate their career-related interests into goals and goals into actions, if they perceive environmental barriers will impede their efforts (Lent et al., 2000). Whereas, an individual's perception of ample support and few barriers is predicted to facilitate the process of transforming their interests into goals and ultimately, goals into actions. This relationship has been supported by studies that found parent, peer, and teacher support was predictive of career aspirations (Farmer, 1985), perceptions of career opportunities (Wall, Covell, & MacIntyre, 1999), and differences in self-efficacy (Lapan, Hinkelman, Adams, & Turner, 1999).

Learning Experiences

In the SCCT model, Lent and colleagues (1994) posit that experience contributes directly to an individual's sense of efficacy and outcome expectations. Bandura (1997) identified four types of learning experiences that influence the development of one's self-efficacy and outcome beliefs. These include vicarious learning, personal performance accomplishments, social persuasion, and physiological and affective states and reactions. These four types of learning experiences influence self-efficacy and outcome expectations. Performance accomplishments are considered to be the most influential learning experience (Bandura, 1997). Vicarious learning also influences self-efficacy through observations of similar others' successes and failures. Through studies using encouragement and discouragement, social persuasion has been found to impact efficacy beliefs (Luzzo & Taylor, 1993-1994). Physiological and affective states, such as levels of composure or stress, also affect the way a person perceives their capabilities (Lent et al., 1994).

Conclusions and Recommendations

A limited number of studies have been conducted related to the career decisions of preservice agricultural teachers. These studies were primarily graduate follow-ups and have shown that students who pursue careers in teaching are as academically able or more so, than their peers who chose to not teach. Additional research examining the career decisions of agricultural education graduates is greatly needed in order to address the root causes of the shortage of teachers.

The SCCT appears to be an ideal theory for explaining the development of career interests and decisions of agricultural education graduates because it focuses on specific mechanisms that shape interests and choices related to entry into the profession. Utilizing the SCCT model and its central constructs may provide agricultural education researchers with a guiding framework for studies to better understand the career decisions of preservice agriculture teachers. Research is needed to test the relevance of this model and the influence of its constructs on preservice teachers' decision to enter teaching.

Self-efficacy has been found to have an influence on career decision. Additionally, teacher efficacy had a positive relationship with teacher performance and commitment, as well as the achievement of students. Research investigating the effect of preservice teachers' efficacy on their career decisions is necessary as it may provide a basis for interventions to increase preservice teachers' sense of efficacy. Such interventions may ultimately impact their decision to enter the teaching profession.

The expected outcomes of career decisions have been found to influence an individual's choice actions. Negatively perceived outcomes of a career teaching agriculture may contribute to a student's decision to pursue employment in other fields. Future studies should attempt to identify preservice agriculture students' perceptions of career outcome expectations; so that positive perceptions can be reinforced and negative outcomes can be addressed.

Barriers to career goals are perceived differently by men and women, and by ethnicity. Through their influence on self-efficacy, role models affect an individual's beliefs in their own ability to overcome barriers and achieve their career goals. Further research is needed to identify career barriers for preservice teachers, investigate gender and ethnicity differences in perceptions of career barriers, and examine the influence of role models on career decisions.

Person inputs, such as gender, ethnicity, and socioeconomic status indirectly influence career decisions. Differences in person inputs can cause differential access, opportunity, and support, which affects learning experiences and in turn, give rise to self-efficacy and outcome expectations. Future research should investigate possible relationships between various person inputs and preservice agriculture teachers' perceptions of self-efficacy, outcome expectations, and their decision to teach.

Environmental influences shape learning experiences and moderate the process of transforming career interests into choice actions. Perceptions of barriers, such as gender discrimination, impede career aspirations while support systems facilitate the pursuit of those aspirations. Additional research is warranted to identify potential career barriers and supports for preservice agriculture teachers and to determine the influence of such barriers and supports on an individual's career decisions.

Learning experiences directly impact self-efficacy and outcome expectations. Bandura (1986) identified four types of learning experiences that have been found to influence the development of an individual's beliefs about self-efficacy and outcome expectations. Preservice teachers should be exposed to these types of learning experiences throughout their preparation program. Additionally, these learning experiences should be examined to determine their effect on preservice teachers' perceptions of self-efficacy and outcome expectations. Ultimately, teacher preparation programs may be able to provide more of the experiences that have the greatest influence on preservice teachers' self-efficacy and outcome expectancy beliefs.

This study synthesized the research related to the SCCT (Lent et al., 1994) to determine its usefulness for investigating the career decision process of preservice agriculture teachers. After analyzing the findings of this study, it became apparent that the SCCT has great potential as a guiding framework for future career-choice studies in agricultural education. Based on these findings, several research recommendations were provided. Researchers should use these recommendations as a basis for future studies to assist the profession in achieving a better understanding of the career decisions of preservice agriculture teachers.

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CHALLENGES EXPRESSED BY COOPERATING TEACHERS WHEN WORKING WITH STUDENT TEACHERS IN AGRICULTURAL EDUCATION: A DELPHI STUDY

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Abstract

The purposes of this study were to develop a prioritized list of cooperating teacher challenges when working with student teachers in hope of improving a teacher education program at the University of Tennessee and to determine if there were different challenges between the eastern, middle, and western region cooperating teachers of Tennessee. Results of this study were obtained by utilizing a modified Delphi technique to reach group consensus.

Consensus was reached on eight challenges. Some of those challenges included student teachers' discipline procedures, work ethic, time management skills, lack of knowledge in some curriculum areas, and preparing student teachers to take full responsibility of the classroom.

Regional representation of cooperating teacher challenges was also established. The eastern region primarily reached consensus on student teacher challenges in the area of discipline procedures, work ethic, and taking full responsibility of the classroom. The middle region reached consensus on challenges with student teachers in the area of discipline procedures, work ethic, lack of knowledge of different teaching styles, time management skills, taking full responsibility of the classroom, lack of knowledge in some curriculum areas, and not devoting time to extracurricular activities (e.g., contests, training teams, SAE visits, chapter events). The western region reached consensus on challenges with student teachers in the area of discipline procedures, work ethic, time management skills, trying to be the high school students' "buddy," taking full responsibility of the classroom, exposing student teachers to activities that occurred the prior semester because it is on their student teaching checklist, student teachers thinking they can teach like someone who has taught for years but lack experience and good judgment, getting student teachers to understand diverse learning abilities, working off-campus visits into the student teaching time frame, and ensuring that high school students don't suffer academically from the student teacher.

Introduction/Theoretical Framework

The National Standards for Teaching Education in Agriculture (2001) outlined a clear pathway for agricultural teacher education programs to follow. Clearly, standard one stated the conceptual framework must be in alignment with processes, expected outcomes, and realities of teaching agricultural education. In addition, a clear linkage between the conceptual framework and contemporary issues in the field (problems of practice) need to be analyzed (e.g., needs assessment) and used to revitalize a program. Therefore, needs assessments must be a priority for teacher education programs to conduct and establish the areas of improvement for the future preparation of student teachers in agriculture. However, what supervisory stakeholder has the most influence on the student teacher?

Supervision, founded on the basis of leadership, occurs at all levels. For example, there are teacher educators, superintendents, principals, mentor teachers, and cooperating teachers who supervise teachers in an educational system. Particularly, cooperating teachers serve as one of the most influential individuals to student teachers (Norris, Larke, & Briers, 1990; Roberts & Dyer, 2004). In addition, cooperating teachers serve as mentors, supervisors, friends, and fellow colleagues. Additionally, Schumacher and Johnson (1990) suggested that the influence of the cooperating teacher can be a direct reflection on the student teacher's success. In addition to a cooperating teacher's influence, Martin and Yoder (1985) also identified the importance of a good working relationship with student teachers. Furthermore, Glickman, Gordon, and Ross-Gordon (2001), Glatthorn (1997), and Ralph (1998) recommended tailoring the supervisor-teacher relationship to meet the needs of the teacher.

Cooperating teachers take on several responsibilities while supervising student teachers, and those responsibilities can create many challenges. Recent research has revealed some concerns that cooperating teacher's face. Some major concerns of cooperating teachers regarding student teachers are classroom management and student discipline (DelGesso & Smith, 1993; Sandholtz & Wasserman, 2001). Other areas of concern are communication between the university supervisor and cooperating teacher, time commitment, and insufficient input on student teaching expectations. (Lelle & Kotrlik, 1987; Deeds, Flowers, & Arrington, 1991). Furthermore, cooperating teachers expressed the need for teacher education programs to devote more time to addressing student teaching issues (DelGesso & Smith, 1993; Sandholtz & Wasserman, 2001).

Deeds, Flowers, and Arrington (1991) emphasized that the student teaching experience should be a concern of the profession. Furthermore, Kuehl (1984) accentuated that careful supervision of student teachers and the environment the student teacher is exposed to become imperative to their development. The cooperating teacher, however, is the major component in the development of student teachers, but what challenges do they face while supervising the student teacher? Answering this question may reveal some stepping stones for teacher education programs and future preparation of student teachers.

Purpose and Objectives

The purposes of this study were to develop a prioritized list of cooperating teacher challenges when working with student teachers in hope of improving a teacher education program at the University of Tennessee and to determine if there were different challenges between the eastern, middle, and western region cooperating teachers in Tennessee.

Methods and Procedures

This descriptive study utilized a modified Delphi Technique to identify challenges that cooperating teachers in a Southern state faced while supervising student teachers in agricultural education. Helmer (1983) stated that the object of the Delphi Technique is to "obtain the most reliable consensus of opinion of a group of experts” (p. 135). Moore (1987) defined an expert in a Delphi Technique as a person who is knowledgeable about the area being studied. One purpose of the Delphi technique is to gather information to help improve programs (Moore, 1987); therefore, a group of experts was selected to identify potential problems of supervising student teachers.

The population consisted of all agricultural education teachers that had served as a cooperating teacher for three universities in Tennessee. Cooperating teachers (n=24) were purposefully selected from Tennessee by three university teacher educators (one teacher educator representative from the western, middle, and eastern region) and identified as outstanding cooperating teachers; therefore, 24 cooperating teachers served as experts for the study. The cooperating teachers were selected based on overall feedback obtained from student teachers, commitment to the profession, overall success of their program, and years of experience. Face validity of instruments was determined by teacher educators in agricultural education and graduate students majoring in agriculture at the University of Tennessee. Dalkey (1969) stated that the reliability was greater than .80 when the Delphi group size was larger than 13.

A series of three questionnaires were mailed out. Each mailing consisted of a cover letter, a questionnaire, and a stamped return envelope. The first questionnaire consisted of one open-ended question: “What challenges do cooperating teachers face when working with student teachers?” The open-ended question was used to produce a wide array of responses relating to challenges cooperating teachers faced when working with student teachers. There were a total of 46 responses obtained from 20 panel members, for a response rate of 83.33%. Similar statements were condensed to form one statement; therefore, 31 statements were utilized in the second questionnaire.

The purpose of the second questionnaire was to prioritize statements. Panel members were instructed to circle the number that best represents their level of agreement to the 31 statements obtained from the first questionnaire. The 31 responses were quantified using a Likert-type scale consisting of the following choices: 1=Strongly Disagree, 2=Disagree, 3=Uncertain, 4=Agree, 5=Strongly Agree. The questionnaire was distributed to the 24 cooperating teachers. Twenty returned the second questionnaire for a response rate of 83.33%. Once participants returned the questionnaire, mean and standard deviation were calculated for each response. Responses were arranged in order from highest (strongly agree) to lowest (strongly disagree) and listed on the third questionnaire. In addition, statements with standard deviation scores lower than 1.0 were identified by researchers as consensus statements among the group but were not identified as such on the questionnaire.

The third questionnaire was administered to 20 panel members that returned the second questionnaire for the purpose of establishing consensus. During the third round, panel members were given the group rating and overall rating of each question. Participants were asked to agree or disagree with ranking of the 31 comments. If they agreed, participants returned the questionnaire unmarked. Furthermore, if a participant disagreed with consensus, he/she explained the reason for disagreeing and returned the questionnaire. A total of 13 questionnaires were returned for a response rate of 65%.

At the conclusion of data collection, questionnaires were separated by region. In Tennessee, there are three regions (West, Middle, and East) that offer agricultural education programs. Each program prepares agricultural education teachers differently (e.g. course offerings, supervision differences, and different student teaching requirements); therefore, the data was analyzed by regions to distinguish between regional challenges faced by cooperating teachers when working with student teachers.

Data were analyzed using descriptive statistics. Nominal data were reported using frequencies and interval data were reported as means and standard deviations.

Findings

This study sought to develop a prioritized list of cooperating teacher challenges when working with student teachers in hope of improving a teacher education program at the University of Tennessee. A modified Delphi technique was utilized to help reach group consensus. The first round questionnaire sought responses to the question "What challenges do cooperating teachers face when working with student teachers?" Table 1 outlines specific challenges that were identified and the number of responses for each challenge.

As documented in Table 2, respondents agreed on 13 cooperating teacher challenges; however, only eight challenges faced by cooperating teachers had a strong consensus ($SD \leq 1.0$) among the group. Some of those challenges included student teachers' discipline procedures, work ethic, time management skills, preparing student teachers to take full responsibility of the classroom, and lack of knowledge in some curriculum areas.

Regional representation of cooperating teacher challenges when working with student teachers was also displayed in Table 2. The cooperating teachers from the eastern region primarily reached consensus on challenges related to discipline procedures, work ethic and taking full responsibility of the classroom.

The cooperating teachers from the middle region reached consensus on challenges related to discipline procedures, work ethic, lack of knowledge of different teaching styles, time management skills, taking full responsibility of the classroom, lack of knowledge in some curriculum areas, and not devoting time to extracurricular activities (e.g., contests, training teams, SAE visits, chapter events).

Cooperating teachers from the western region reached consensus on several challenges related to working with student teachers. Some of those challenges were discipline procedures, work ethic, time management skills, trying to be the high school students "buddy," taking full responsibility of the classroom, exposing student teachers to activities that occurred the prior semester because it is on their student teaching checklist, student teachers thinking they can

Table 1
Delphi Study Round One: Challenges Faced by Cooperating Teachers (n=20)

Challenges	Number of Responses
Student teachers not taking the student teaching experience seriously.	4
Student teachers that don't devote time to extracurricular activities (ex: contests, training teams, SAE visits, chapter events).	4
Student teachers trying to be the high school students "buddy."	3
Getting student teachers to prepare lessons.	3
Teaching student teachers about the day-to-day procedures of teaching.	3
Getting student teachers to find a balance in their curriculum (not too easy and not too hard).	3
Preparing student teachers to take full responsibility of the classroom.	3
Student teachers" discipline procedures.	3
Getting student teachers to understand school policy.	3
Having personality conflicts with the student teacher.	2
Student teachers' leadership abilities.	2
Getting comfortable with supervising student teachers.	2
Getting student teachers to understand diverse learning abilities.	2
Student teachers' lack of professionalism.	1
Student teachers' lack of maturity.	1
Exposing student teachers to activities that occurred the prior semester because it is on their student teaching checklist.	2
Student teachers' lack of knowledge of different teaching styles (rely too much on lecture).	2
Attitude of the student teacher.	1
Student teachers thinking they can teach like someone who has taught for years but lack experience and good judgment.	1
Working off-campus visits into the student teaching time frame.	1
Student teachers' time management skills.	1
Developing a good communication system with the student teacher.	1
Aiding the student teacher in curriculum development.	1
Student teachers' work ethic.	1
Providing valuable feedback to the student teacher.	1
Student teachers need more training on the importance of professional organizations.	1
Student teachers' lack of knowledge in some curriculum areas.	1
Getting student teachers to prepare lesson plans.	1
Providing the real-classroom environment to the student teacher that will allow him/her to use the teacher training for its purpose.	1
Ensuring that high school students don't suffer academically from the student teacher.	1
Student teachers' misuse of planning time.	1

Table 2

Delphi Study Round Two: Prioritized List of Challenges Faced by Cooperating Teachers (n=20)

Challenges	East		Middle		West		Overall	
	M	SD	M	SD	M	SD	M	SD
Student teachers' discipline procedures.	4.33	1.00	4.00	1.00	4.25	0.50	4.20	0.89
Student teachers' work ethic.	4.11	0.60	4.00	1.00	4.50	0.58	4.15	0.75
Student teachers' lack of knowledge of different teaching styles (rely too much on lecture).	3.56	1.33	3.71	0.95	4.25	1.50	3.75	1.21
Student teachers' time management skills.	3.44	1.01	3.86	0.38	4.00	0.00	3.70	0.73
Student teachers trying to be the high school students "buddy."	3.89	1.17	3.29	1.11	4.00	0.82	3.70	1.08
Preparing student teachers to take full responsibility of the classroom.	3.33	1.00	3.86	0.90	4.00	0.82	3.65	0.93
Teaching student teachers about the day to day procedures of teaching.	3.78	1.20	3.43	0.98	3.50	1.29	3.60	1.10
Exposing student teachers to activities that occurred the prior semester because it is on their student teaching checklist.	3.56	1.24	3.29	0.49	4.25	0.50	3.60	0.94
Student teachers' lack of knowledge in some curriculum areas.	3.56	1.13	3.71	0.49	3.50	0.58	3.60	0.82
Student teachers thinking they can teach like someone who has taught for years but lack experience and good judgment.	3.22	1.09	3.43	1.27	4.50	0.58	3.55	1.15
Getting student teachers to understand diverse learning abilities.	3.56	1.01	3.29	0.95	4.00	0.82	3.55	0.95
Working off-campus visits into the student teaching time frame.	3.44	1.01	3.29	0.76	4.25	0.50	3.55	0.89
Student teachers that don't devote time to extracurricular activities (e.g., contests, training teams, SAE visits, chapter events).	3.11	1.27	3.86	0.69	3.76	0.50	3.50	1.00
Student teachers need more training on the importance of professional organizations.	3.11	1.45	4.00	1.15	3.25	0.96	3.45	1.28
Ensuring that high school students don't suffer academically from the student teacher.	3.11	1.36	3.29	0.76	4.50	0.58	3.45	0.97
Getting student teachers to find a balance in their curriculum (not too easy and not too hard).	3.22	0.97	3.43	1.13	3.75	0.50	3.40	0.94
Attitude of the student teacher.	2.89	1.05	3.57	0.79	3.50	1.00	3.25	0.97
Developing a good communication system with the student teacher.	3.11	1.05	3.29	1.25	3.50	1.00	3.25	1.07
Student teachers' lack of confidence.	3.22	1.20	3.29	0.95	3.25	0.96	3.25	1.01
Providing valuable feedback to the student teacher.	3.11	1.27	3.29	0.95	3.25	0.96	3.20	1.06

Challenges	East M	East SD	Middle M	Middle SD	West M	West SD	Overall M	Overall SD
Aiding the student teacher in curriculum development.	2.67	1.00	3.14	1.46	4.50	0.58	3.20	1.28
Student teachers' misuse of planning time.	2.67	1.12	4.00	0.58	3.00	1.41	3.20	1.15
Student teachers' lack of professionalism.	3.67	1.12	2.86	1.21	2.75	0.50	3.20	1.10
Student teachers' lack of maturity.	3.00	0.87	3.14	0.90	3.25	1.26	3.10	0.91
Getting student teachers to prepare lesson plans.	3.00	1.12	3.00	1.15	3.25	0.96	3.05	1.05
Student teachers' leadership abilities.	2.78	0.97	3.29	0.95	3.25	0.96	3.05	0.95
Getting student teachers to understand school policy.	2.89	0.93	2.86	1.22	3.50	1.00	3.00	1.03
Providing the real-classroom environment to the student teacher that will allow him/her to use the teacher training for its purpose.	2.22	1.20	3.14	0.90	3.75	0.50	2.85	1.14
Getting comfortable with supervising student teachers.	2.67	1.41	3.29	1.25	2.50	0.58	2.85	1.22
Student teachers not taking the student teaching experience seriously.	2.33	0.87	3.29	1.11	2.50	1.29	2.70	1.08
Having personality conflicts with the student teacher.	2.33	0.87	2.00	0.82	2.25	1.26	2.20	0.89

Note. 1 – 1.49=Strongly Disagree, 1.50–2.49=Disagree, 2.50–3.49=Uncertain, 3.50–4.49=Agree, 4.49–5.0=Strongly Agree

teach like someone who has taught for years but lack experience and good judgment, getting student teachers to understand diverse learning abilities, working off campus visits into the student teaching time frame, and ensuring that high school students don't suffer academically from the student teacher.

In round three, respondents were sent their individual and panel results. They were asked to provide comments if they disagreed with a particular statement. Some cooperating teachers believed that challenges such as not devoting enough time to extracurricular activities (e.g. contests, training teams, SAE visits, chapter events), attitude of the student teacher, developing a good communication system with the student teacher, student teachers' lack of professionalism, and getting comfortable with supervising student teachers should have been ranked higher. However, the major challenge for all cooperating teachers that responded to round three was student teachers not devoting enough time to extracurricular activities. For example, one cooperating teacher wrote, "Student teachers think their day ends at 3:15 p.m. and are not dedicated to staying late, etc."

Conclusions/Implications/Recommendations

The data from this study were utilized to improve the University of Tennessee's teacher education program and to determine if there were different challenges expressed by the eastern, middle, and western region cooperating teachers. These findings can not be generalizable to all cooperating teachers but only to the 20 cooperating teachers that agreed to participate in this study.

There were several challenges expressed by cooperating teachers. Some overarching challenges expressed and agreed upon by cooperating teachers from all three regions were: student teachers' discipline procedures, work ethic, time management skills, preparing student teachers to take full responsibility of the classroom, and lack of knowledge in some curriculum areas. Two of the challenges expressed, taking full responsibility of the classroom and student discipline, were congruent with studies by DelGesso and Smith (1993) and Sandholz and Wasserman (2001).

The eastern, middle, and western regions agreed upon some challenges related to working with student teachers; however, each expressed unique challenges to their own region. The eastern region agreed on challenges related to student teachers' discipline procedures, work ethic, and taking full responsibility of the classroom. However, the middle and western region both expressed challenges regarding student teachers time management skills, lack of knowledge in some curriculum areas, and devoting enough time to extra curricular activities (SAE, FFA, etc.). To differentiate between the middle and western region, the middle region expressed unique challenges related to student teachers' teaching styles and the western region expressed challenges related to student teachers trying to be the high school student's "buddy," teaching like they have taught for years, understanding diverse learning abilities, and making sure high school students don't suffer academically from the student teacher. In addition, the western region expressed administrative challenges such as exposing student teachers to activities that occurred the previous semester and working off-campus visits into the student teaching time frame.

The middle and western regions expressed more challenges than the eastern region. In addition, more administrative concerns were expressed by the western region cooperating teachers. One may conclude that these areas are not being addressed extensively enough in teacher education programs in Tennessee; therefore, cooperating teachers are experiencing significant challenges with the student teaching experience.

DelGesso and Smith (1993) and Sandholtz and Wasserman (2001) stated cooperating teachers expressed the need for teacher education programs to devote more time to addressing student teaching issues. Addressing these student teaching issues, the purpose of this study, became a priority for a teacher education program in Tennessee. One tactic to address these issues was to restructure the nature of the undergraduate agricultural education program at the University of Tennessee. The restructured undergraduate program has incorporated lab based experiences into the program planning and teaching methods courses; therefore, student teachers will conduct an early field based experience (observation of other agricultural education teachers), assist high school agricultural education teachers with the overall planning of their program, teach one or two classes over a semester in a high school classroom, and complete the student teaching experience. This opportunity will provide student teachers more applicable experiences to connect their college coursework to real-world experiences. In addition, student teachers will have the opportunity to be exposed to a high school classroom three times prior to student teaching and address several challenges expressed by cooperating teachers in this study.

Implications from this study are relative to all teacher education programs, particularly the other three universities that prepare agricultural education teachers in Tennessee. Confronting cooperating teachers related to their challenges of working with student teachers could reveal several areas of improvement for the undergraduate agricultural education program. Cooperating teachers are one of the most influential individuals to student teachers (Norris, Larke, & Briers, 1990; Roberts & Dyer, 2004), and Schumacher and Johnson (1990) suggested that the influence of the cooperating teacher can be a direct reflection on the student teacher's success. Overall, cooperating teachers are individuals who have a great deal of responsibility in the development of student teachers; therefore, their input should be critical in the development of the undergraduate agricultural education program. Additionally, the data revealed challenges that could be utilized as professional development topics for cooperating teachers. Providing additional workshops related to mentoring students teachers could be helpful to cooperating teachers because they could address some of these issues and obtain feedback from other colleagues.

Future research is still needed to answer questions that surfaced from this study. Research should strive to answer the following:

1. After infusing more lab-based experiences into the teacher education program at the University of Tennessee, will cooperating teacher challenges decrease or stay the same?

2. What challenges are cooperating teachers faced with in other states that prepare agriculture educators?

3. By increasing the number of lab-based experiences, will teacher educators at the University of Tennessee observe a difference in the overall preparation of agricultural education student teachers?

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CORRELATIONAL AND PREDICTIVE ATTRIBUTES OF DEMOGRAPHIC FACTORS AND THEIR RELATIONSHIP TO HISPANIC PARTICIPATION IN TEXAS EXTENSION PROGRAMS

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Abstract

Predicated on the rapidly changing ethnic demographics in Texas and 69.3% parity levels for Hispanic participants in Extension programs, this causal-comparative study examined relationships between thirteen demographic variables and levels of Hispanic participation in Texas Extension programs. Parity was used as measure of participation and calculated as a 3-year mean percent of Hispanic participation from 2001-2003. Statewide, parity levels ranged from 38.9% - 99.7% for state goals and from 6% to 251% for statewide initiatives. Hispanic participation in county programs varied from 0% to 409% parity.

Variables were collected through a web-based instrument and through data provided by human resource departments. A pilot test resulted in internal validity of .77 using Cronbach's alpha. The two objectives of the study were to determine the nature of correlational and causal relationships between thirteen independent variables and the dependent variable. Confidence levels were set at .05 a priori and data were analyzed through descriptive statistics, bivariate correlations, and a linear regression model. A population of 332 county faculty from TCE (1862) and CEP (1890) were studied.

It was found that six variables were positively correlated, four variables were negatively correlated, and three variables were not correlated to Hispanic participation. Variables with statistically significant predictive characteristics in their B value included ANR (-36.36), 4-H (20.02), non-urban (-23.08), and committee parity (.10).

It was concluded that those variables with positive correlations had the potential to increase Hispanic participation while those with negative correlations could be detrimental to Hispanic participation. It was also concluded that experience, education, and certain titles are not associated with Hispanic participation. Certain demographic variables could be used to predict increases and decreases in Hispanic participation when used in a regression model.

Introduction

In keeping with its mission, Extension education continues to change its programs to meet the needs of a changing society. Once a rural, agrarian state with the bulk of the population concentrated in the eastern portion of the state, Texas has changed significantly in the last century. By 2030, trends suggest a population that is 63% ethnic minority and is poorer, less educated, and less equipped to compete globally. Growth patterns suggest increases in demand for owned housing, health care, personal care costs, and reduced demand for traditional educational services. The future of Texas is one of increased use of welfare and human service programs, lower per capita tax revenues, and increased government costs (Murdock et. al, 1997).

For an agency dedicated to education and, in addition, one that is non-formal in nature, Extension has great potential to position itself to meet the educational needs of Hispanic audiences if it can dedicate itself to reducing institutional barriers, developing relevant competencies among its faculty, and implementing methodologies that will serve the specific needs of Hispanic audiences. Otherwise, Extension may be perceived as a traditional educational service that serves a very narrow audience and not valued as highly by nontraditional audiences or viewed as a contemporary provider of educational programs and services.

Bernard Jones, former chair of ECOP, Dean and Director of Nevada Cooperative Extension, stated that the land grant system, including Cooperative Extension, was not created with a narrow focus on agriculture. He went on to say that the land grant system was created based on societal needs of the people and of the nation and the mission of Extension reflects this strong commitment to the needs of people. Further, he indicates that Extension cannot expect a great future if it remains primarily focused on 2% of the population involved in production agriculture. Jones insisted that only quality programs will receive funding in the future and while Extension has quality programs, it also has a number of outdated programs. Extension must also hire more diverse faculty and must expand the scholarly achievements of faculty to assure that they maintain credibility and respect among peers and the public (Jones, 1992).

As a provider of non-formal education, Extension is in a position to respond to the needs of the fast growing Texas Hispanic community by developing and delivering appropriate educational responses that can be helpful to Hispanic audiences throughout Texas and the nation. An understanding of the specific needs of this audience and the skills to effectively develop, deliver, and evaluate educational programs to these audiences is critical to any successful effort. A three-year average of reporting data (2001–2003) from the Texas Cooperative Extension report database (TCE, 2003) showed an average of 58,049 records per year, 132,176 group methods per year, and 2,908,715 educational contacts per year. Of those contacts, Hispanics accounted for an average of 683,485 per year, or 23.5%. At this level and considering the 33.9% Hispanic share of the Texas population, Extension programs are reaching Hispanics at a 69.3% parity level (Census, 2002).

Parity was used as a performance factor in this study to describe the degree to which Extension agents successfully reached Hispanics in their county at a level that mirrored the demographics of the county. It was also used as a way to compensate for the range of differences in Hispanic populations throughout the 254 counties in Texas. The use of the term parity was in the place of formal legal terms such as disparate treatment or disparate impact because it was the purpose of this study to identify variables that could reasonably lead to higher levels of Hispanic participation in Extension programs and not to identify elements of Texas Extension programs that had discriminatory intent or effect. Nonetheless, the issue of civil rights cannot be separated from studies that explore reasons why certain protected populations are not served or do not benefit from public services in equitable proportions to mainstream populations.

Further analysis of state reporting data by state goal and by selected identifier codes allowed more precise description of data relevant to this study. Table 1 illustrates Hispanic participation in each of four state goals and parity levels for each goal. State Goal 1 is related to the issues of health, safety, and well-being and showed the highest percentage of Hispanic participation at 33.8%. This participation rate is 99.7% of parity. Parity was calculated by dividing percent participation by 33.9%, a fixed factor that represented the percent Hispanic population for Texas.

On the opposite end of the scale, the state goal dedicated to economic competitiveness, goal 3, had a participation rate of 13.2% Hispanics, 38.9% of parity. The other two goals, environmental stewardship and life skills/leadership, showed 21.6% and 21.3% Hispanic participation, respectively. These statistics place Extension programming for one goal at parity with the population and leave the other three goals at significantly lower levels ranging from 38.6% to 63.7% of parity.

Table 1: *% Hispanic participation and parity levels by state goal, 2001-2003*

State Goal	Health (1)	Env. Stew. (2)	Econ. Comp (3)	Life Skills (4)
% Hispanic Part.	33.8	21.6	13.2	21.3
% Hisp. Pop. (2002)	33.9	33.9	33.9	33.9
% Parity	99.7	63.7	38.9	62.8

To further describe current levels of Hispanic participation in Extension programs, monthly report data was retrieved according to a variety of statewide initiatives. A total of 38 statewide initiatives were examined. Only 11 of the 38 initiatives selected met or exceeded parity. Overall, Exension's average for Hispanic participation falls below that of their share of the population. While some programs clearly exceed parity, others fall sufficiently short of it so as to draw the organizational average to its level at 69.3% of parity.

The need to improve Hispanic outreach in TCE has been driven by fast changing demographics in the state, state administrative support for a state diversity plan, including staffing priorities for minority faculty and emphasis on hiring county faculty that reflect the demography of the state and the counties they serve (Gillespie, 2003). Furthermore, Gillespie (1996) provided evidence that Hispanics will participate in Extension programs given the opportunity, relevant programs that meet their needs, and appropriate educational approaches. Gillespie (1996) cited a finding in her five-year project for Texas Cooperative Extension that Hispanics were eager to participate in Extension educational programs. These findings challenge the common assumption that a lack of participation by Hispanics is caused wholly by their lack of interest and has no relationship to organizational variables. Conversely, these findings support the need for more detailed study of variables that affect Hispanic participation in Extension programs and eliminate audience initiative or interest as the lone variable(s).

Theoretical Framework

Knowles' et al. (1998) core principles of adult learning are a critical framework from which to consider strategies that could improve programs and services for Hispanics. While some references to pedagogical theory were cited, adult learning theory is considered most relevant to this study for three reasons. One is that the majority of Extension audiences are adults (TCE, 2003). The second is that the nature of non-formal education employs program development and delivery processes that are consistent with adult learning theory (Harman, 1976). Finally, much of the pedagogical theory is shifting from a teacher-centered focus to learner-centered approaches such as "learning communities" that are also consistent with Knowles' learning theory (Reyes, Scribner, & Scribner, 1999).

Grossman (1984) found that ethnicity was a factor in successful educational approaches for Hispanics. Hispanic learners whose teachers were also Hispanic experienced greater success in school while those with non-Hispanic teachers didn't. Non-Hispanic teachers were also less likely to make accommodations for Hispanics. However, as non-Hispanic educators gained experience working with Hispanic learners, the differences in student performance based on ethnicity declined.

Warrix and Bocanegra (1998) found that efforts to reach Hispanic Day Care Providers in the Cleveland area were more successful when Hispanics were placed on Extension advisory committees and involved in focus groups that. Cano and Bankston (1992) studied minority participation in the 4-H program. They found that a lack of role models among agents, staff, and volunteers affected participation.

Finally, Hispanics are overrepresented in urban areas. According to U.S. Census data, (U.S. Census, 2003), the proportion of Hispanics living in urban areas exceeds that of the population as a whole. While only 58% of the composite state population lives in the six most populous counties in Texas, approximately 67% of Hispanics reside in the largest six urban areas. This suggests that urban areas could be a factor in reaching Hispanics.

Purpose and Objectives

The purpose of this study was to identify demographic variables that affect the levels of Hispanic participation in Texas Extension programs. Given Extension's charge to serve the people of Texas and given that Hispanics are underrepresented in many Extension programs, this study compared the dependent variable "program parity" to a series of demographic variables to determine those factors positively and negatively correlated to the level of Hispanic participation in a given county program. Program parity allowed for the comparison of Hispanic participation in a given county program to be compared to the Hispanic population in that given county rather than to a state average. To assure broad representation of programs, the study included agriculture and natural resources, family and consumer sciences, 4-H and youth development, and community development programs. It also included the full scope of field-based Extension agents from both Texas Cooperative Extension (1862) and the Prairie View A&M Cooperative Extension Program (1890).

The following objectives were identified for this study:

1. What demographic variables are correlated to Hispanic participation in Texas Extension programs?

2. What characteristics do demographic variables possess in predicting Hispanic parity, or participation, in Texas Extension programs?

Procedures

The population of this study included all Extension agents working on behalf of Texas Cooperative Extension (TCE) and Prairie View A&M University's Cooperative Extension Program (CEP). The population for both agencies included approximately 650 faculty members of which 332 met the criteria for the study. Only faculty that were currently employed with TCE or CEP and had three years of data in the same county were included in the census. Any county faculty who had been hired or had moved since January 1, 2001, was excluded from the study to assure each included subject had a full three year report record in a single county. This three year report record provided the basis for the calculation of the dependent variable, program parity. A consolidated list of eligible faculty was established that included both Texas Cooperative Extension and Prairie View Cooperative Extension Program faculty included in the study.

This research design for this study was causal-comparative as recognized by Gall, Borg, and Gall (1996). Percent Hispanic participation in the subject's program, weighted based on potential Hispanic population in the county, was the variable used as a performance factor in this study and was named "program parity." This measured the level of Hispanic participation relative to the potential population in the county. Parity values were calculated by dividing percent program participation by the percent Hispanic population in the county. This "program parity" factor was used as the dependent variable for this study and was calculated for each subject in the population.

Data were collected through a survey instrument and through Human Resource departments at both Texas Cooperative Extension (TCE) and at the Prairie View Cooperative Extension Program (CEP). Other data were collected through publicly available web sources such as the U.S. Census Bureau (2002) and TCE monarch reporting system. For the data collected through the instrument, the Hardin-Brashears Bi-Modal method (Fraze et al. 2002) was employed to improve response rate.

Data were analyzed through the SPSS statistical analysis package, version 11.0. A total of 194 cases were considered. Using SPSS's option for scale measures, these cases were analyzed and yielded an alpha of .79. Reliability was consistent with the pilot test. Confidence levels were set at 95%, a priori. Control for non-response error on the survey was accomplished by a t-test of early and late respondents. No t values were found to be significant when equal variances were assumed and not assumed to be equal.

Data for respondents were categorized based on several characteristics. These categories represented multiple titles within each category. Agriculture and natural resources (ANR) agents included agriculture and natural resource, natural resources, horticulture, marine, and integrated pest management titles. These represented 113, or 53.1%, of all responses. Family and consumer science (FCS) agents represented family and consumer science and expanded nutrition program titles. These represented 73, or 34.3%, of all responses. The final two categories were 4H titles, representing 21 responses, or 9.9%, and other titles, representing 6 responses, or 2.8%.

Responses by ethnicity included White agents, representing 179 responses, or 84%. Hispanic agents responding to the survey numbered 16, or 7.5%, and Other agents numbered 18, or 8.5%. This final category of "other" agents included African-American, Asian, and other ethnic categories. A total of 56 respondents, or 26.3%, had a Bachelor's degree. One hundred fifty, or 70.4%, had a Master's degree. Finally, seven of the respondents, or 3.3%, had a doctoral level degree.

Texas Cooperative Extension (TCE) provided the greatest proportion of respondents with 197, or 92.5%. Respondent county faculty from the Prairie View Cooperative Extension Program (CEP) accounted for the remaining 7.5%. The TCE employees represent the Extension program established by the Morrill Act of 1862 (CSREES, 2004), while the CEP employees represent the Extension program established by the Second Morrill Act (CSREES, 2004), enacted in 1890 to serve through the historically black colleges and universities in the South.

For analysis purposes, respondents from counties with a population over 250,000 were identified as "urban" while the remaining respondents, representing counties with a population less than 250,000, were identified as "non-urban." A total of 169 respondents, or 79.3%, came from non-urban counties while the remaining 44, or 20.7% were from urban areas. While the Hispanic population in Texas, estimated at 33.9% statewide in 2002, continues to grow at a rapid pace, the distribution of Hispanic population ranged from 1.7% in the northeast County of Cass to 97.4% in Starr County along the southern border of Texas (Census, 2002). The mean Hispanic population from respondent counties was 28.4%. It did not include all counties and counties with multiple respondents likely contributed in part to a mean that was 5.5% lower than the state average. Given that each county stood on its own demographics, this lower mean did not play a role in the overall study.

The dependent variable for this study was program parity and was calculated by dividing the percent Hispanics participation by the percent Hispanic population in the county of the responding agent. Table 2 shows a mean parity value of 66.87. The range of values for program parity was 2.85% to 409.39%. This range indicates that some county faculty were reaching 2.85% of the potential Hispanics in their county while others were reaching Hispanics in proportions that were four times higher than their share of their county population. The mean parity level was 66.9%, which was consistent with the 69.3% state average for the 2001-2003 reporting period. A similar parity value was calculated for committee membership. The range of committee parity values ranged from 0% to 500.8%.

Table 2: *Measures of central tendency and dispersion for program parity values*

	n	*M*	*Mdn*	Mode	*SD*	Range	Variance
Parity	213	66.87	60.45	2.85	49.86	406.54	2485.93

Findings

Measures of central tendency and dispersion for each of the demographic variables tested were collected and are shown in Table 3. With the exception of committee parity, total experience in years, and education, all variables were dummy coded to determine the presence or absence of the selected characteristic. Committee parity showed a mean of Hispanic participation that is just above 50% of the potential for the given county. Education showed a mean that approached a Masters Degree, which is represented by a value of "5." Experience was shown to be slightly more than 18 years with a range of more than 31 years of experience.

Correlations were conducted for the thirteen variables in addition to the dependent variable, program parity. The results of these correlations are in Table 3. The agriculture and natural resources (ANR) title category showed the highest correlation to the dependent variable at -.50. Following ANR in the descending strength of correlation to the dependent variable were gender (-.43), ethnic white (-.30), FCS (.29), 4-H (.29), non-urban (-.29), committee parity (.25), ethnic other (.22), ethnic Hispanic (.19), and 1862/1890 (.14). Those variables with a positive correlation with program parity included FCS, 4-H, committee parity, ethnic other, ethnic Hispanic, and employer (1890). Variables with a negative correlation with program parity included ANR, gender (male), ethnic white, and non-urban. Variables found to have no relationship with program parity included education, total experience, and titles other than ANR, FCS, and 4-H. These were mostly community development positions.

To address objective 2, multiple regression was performed. Variables were examined for evidence of multicollinearity. Those variables correlated to each other at a level of 0.60 or higher were assumed to be collinear. Where confidence levels were met, correlations between variables ranged from a low of .15 to a high of .81. There was a very strong correlation (.81) between gender and title categories for agriculture and natural resources (ANR) and family and consumer science (FCS). As a result, gender was dropped as a variable insofar as it was significant only to the extent that it was correlated to those two title categories. In addition there was a very strong correlation (-.77) between FCS and ANR titles. Because the ANR title showed a stronger correlation to the dependent variable, it was retained as a variable and the FCS variable was dropped. Finally, there were strong correlations among ethnic groups. The White variable was correlated to both Hispanics (-.65) and Others (-.70). The was no correlation between Hispanics and Others. Following the same protocol as prior variables, the variable(s) with the strongest correlation to the dependent variable, ethnic White (-.30) was retained and the other two ethnic variables (.22 & .19) were dropped from the model.

A total of six demographic variables were retained from the original thirteen variables tested for correlation. Those demographic variables remaining, in descending order based on the strength of their correlation to parity, were ANR (-.50), ethnic white (-.30), 4-H (.29), non-urban (-.29), committee parity (.25), and employer (.14).

The six demographic variables retained were entered into a regression equation using the forced entry method. Variables were entered in descending order according to the strength of their correlation with the dependent variable. As such, ANR was entered into the model first and followed by ethnic White, 4-H, non-urban, committee parity, and employer (1862/1890) variables. The results of the model are shown in Table 4. This model explained 35% of the variance (R^2=.35) and produced an F value of 18.18. Four of the six predictors in this model met confidence levels set at .05 a priori. They included ANR, 4-H, non-urban, and committee parity variables. The ethnic white variable was slightly over the confidence level at .06 and the

1862/1890 variable showed a p value of .52, considerably higher than confidence limits set. From these p-values, predictions of parity may be made based on those four predictors that showed statistical significance in the model.

Table 3: *Relationship Between Program Parity and Selected Variables (n=213)*

Variables	%	*M*	*SD*	*R*	*p*
Program Parity		66.87	49.86	1.00	
Committee Parity		56.04	62.56	.25[a]	<.01
County Population		0.79	.41	-.29[b]	<.01
Non-Urban	78.8 %				
Urban	21.2 %				
Education		4.77	.49	-.09 [a]	.21
Bachelors	26.3%				
Master	70.4%				
Doctorate	3.3%				
Years Extension Experience		18.11	8.92	-.08 [a]	.28
Gender				-.43 [b]	<.01
Male	56.0%				
Female	44.0%				
Employer				.14 [b]	.04
1862 (TCE)	91.8%				
1890 (CEP)	8.2%				
Ethnic White		.84	.37	-.30 [b]	<.01
Ethnic Hispanic		.08	.26	.19 [b]	.01
Ethnic Other		.08	.28	.22 [b]	<.01
Title – ANR		.53	.50	-.50 [b]	<.01
Title – FCS		.34	.48	.29 [b]	<.01
Title – 4-H		.10	.30	.29 [b]	<.01
Title – Other		.03	.17	.13 [b]	.06

[a]Pearson Product Moment; [b]Point Bi-serial

Table 4: *Regression Coefficients for Demographic Variables (n=213)*

	B	*SE*	*Beta*	*t*	*p*
Constant	110.61	9.89		11.19	.00
ANR	-36.36	6.53	-.37	-5.57	<.01**
Ethnic White	-17.09	8.84	-.13	-1.93	.06
4-H	20.02	10.28	.12	1.95	.05*
Non-urban	-23.08	7.40	-.19	-3.12	<.01**
Committee Parity	.10	.05	.13	2.10	.04*
1862/1890?	7.49	11.49	.04	.65	.52

Note. R^2=.35; F=18.18. Dependent variable: program parity
* significant at .05 level; ** significant at the .01 level

The B value for the constant in the model, 110.61, represents the y-intercept value from which predictors can be used to predict parity values. The value of the constant is calculated based on the inclusion of all variables except for those held independent in this model. When ANR titles are introduced into the model, the predicted effect on parity is a decrease of 36.36 points, reducing parity from 110.36 to 74.25. The next predictor, 4H, predicts an increase of 20.02 points in parity that results in a predicted parity value of 130.62. When non-urban counties are introduced into the model, parity is predicted to decrease by 23.08 points to 87.53. The last predictor that met confidence levels was committee parity and unlike the other demographic variables, was measured at the interval level. As a result, its B value is considerably different from the others at .10. Because the other variables were dichotomously coded, the only predicted effects on parity are based on the inclusion or exclusion from the model. Unlike those variables, committee parity predicts a .10 increase in program parity for every unit increase in committee parity. If an increase of 1 point in program parity were desired, it would require a 10 point increase in committee parity.

Conclusions

The following summary of conclusions was made based on the findings of this study.

1. It was concluded that the level of Hispanic participation in program development committees is a strategy that can lead to higher levels of Hispanic participation in programs.
2. The variables ANR, ethnic White, 4-H, non-urban, committee parity, and employer (1862 vs. 1890) are good predictors of Hispanic participation and account for more than 1/3 of the characteristics that explain the level of Hispanic participation in Texas Extension programs.
3. Gender is correlated to the level of Hispanic participation only to the extent that it is correlated to ANR and FCS titles.
4. Expanding urban programs could lead to higher levels of Hispanic participation. It was also concluded that there are likely characteristics about large, urban county programs that promote higher levels of Hispanic participation and characteristics about smaller, rural counties that lead to lower levels of Hispanic participation.
5. The relationship between TCE and CEP is one that significantly helps TCE improve its levels of Hispanic participation.
6. Ethnic White agents have a negative effect on Hispanic participation levels while minority agents, regardless of ethnicity, have a positive effect on Hispanic participation.

Recommendations

As a result of conclusions drawn from this study, the following recommendations have been made.

1. Increase the number of ethnic minority county faculty, specialists, supervisors, and state administrators (a goal of 25% would be 75% parity at 2002 population estimates)

2. Appoint minority mentors for newly hired minority faculty
3. Preserve and improve the TCE/CEP relationship and develop voluntary and involuntary opportunities for meaningful joint program development, delivery, and evaluation along with meaningful joint training and education.
4. Improve the current program planning system such that it sets goals related to inclusion and diversity in program plans. Plans should include goals, activities, and evaluation strategies for minority participation in program development committees, programs, and activities. It should also include research-based action strategies for which agents assume responsibility. These strategies should address and overcome barriers and lead to improved Hispanic participation in programs and not be limited to the documentation of "all reasonable efforts" as cited in the Civil Rights Act of 1964 (USDOJ, 2004).
5. Given that ANR agents represented the single strongest variable that had a negative relationship with Hispanic parity levels, it is recommended that a group of stakeholders in that program examine it and develop research-based strategies that would lead to increased levels of Hispanic participation. These strategies might include:
    - ❖ a state Hispanic/minority agriculture advisory committee that would provide guidance and support for the development of state programs for minority stakeholders in agriculture including but not limited to minority farmers and ranchers,
    - ❖ develop a structured urban agriculture initiative that develops, pilots, and supports sustained, research-based food and fiber programs that address urban issues.

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FACTORS CONTRIBUTING TO VOLUNTEER ADMINISTRATION LEADERSHIP PROFICIENCY OF SOUTHERN REGION 4-H COUNTY FACULTY

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Abstract

Volunteer administration leadership is an important component of any successful 4-H program. Proficiency in competencies associated with volunteer administration can prove to be one's greatest asset in his/her ability to successfully develop the leadership of youth. With that, leadership style is also an important consideration because it provides a means for working with individuals and reaching programmatic goals.

The purpose of this research was to determine factors, which contribute to volunteer administration leadership proficiency of 4-H county faculty in the southern region. In order to do this demographics were analyzed, as well as, correlations among identified independent variables. The primary intent was to develop a prediction equation for perceived proficiency in VAL competence.

Seven variables correlated with perceived proficiency in VAL competence; however, two were found to have the greatest predictability of VAL proficiency. Organizational culture (importance) and age were responsible for 43% of the variation in the model.

These factors can guide efforts related to volunteer programming, including professional development opportunities for 4-H county faculty in the southern region. A focused curriculum addressing organizational culture and a mentoring program for faculty has the potential to increase VAL proficiency.

Introduction

In 2003, there were 7,090,920 youth enrolled in 4-H programs across the nation (National 4-H Headquarters, 2004). Yet, the NAE4-HA (2004) reported that there were only 3600 youth development professionals as members, even though this is not inclusive of all 4-H faculty, it does provide a basis for comparison. This creates a county faculty to youth ratio of 1:1970, not an effective means for producing outcomes, like "care," "guidance," and "wisdom" (National 4-H Headquarters, 2001). However, the National 4-H Headquarters (2004) reported 449,966 volunteers last year, decreasing the adult:child ratio to 1:16, a ratio more appropriate for increasing programmatic effectiveness.

Today, the 4-H county faculty member wears a number hats, educator, facilitator, leader, and volunteer administrator. Thirty years ago, Boyce (1971) addressed the concerns that 4-H county faculty alone would not be able to serve the growing number of youth in 4-H programs.

When there are nearly 450,000 adults contributing to 4-H programs across the nation, it is essential for 4-H county faculty, regardless of what hat they are currently wearing, to understand the importance of volunteer administration leadership (VAL). The most effective way to ensure the continued contributions of volunteers to the 4-H mission is by providing prepared county faculty members. Boyce (1971) explored the notion of withholding information as power in his application of the ISOTURE model to 4-H adult volunteer leaders. He understood the value of volunteers to the organization and provided a framework for 4-H county faculty to adhere.

Even though the profession is only 20 years old, the contributions of extension personnel to the field are still prominent (Boyce, 1971; Culp, Deppe, Castillo & Wells, 1998; Kwarteng, Smith & Miller, 1987; Penrod, 1991). Researchers have examined extension faculty's perceptions of volunteer administration models across the U.S. (Culp& Deppe, 2001; Culp & Kohlhagen, 2004; Hange, Seevers, & VanLeeuwen, 2002). Key areas of volunteer administration, including needs assessments, use of job descriptions, resource location and recruitment, were determined to be areas of additional education (Culp, 2001). Hange, Seevers, and VanLeeuwen (2002) were able to show that differences between perception and importance in nine competency areas of volunteer administration existed, supporting King (1997).

As the field of VAL continues to develop focused research in the field is essential for continued growth (Culp, 2001), extension faculty, especially those identified as having a high level of interaction with volunteers, like 4-H county faculty, are a population that has direct benefit from research initiatives; including those initiatives pinpointing key characteristics of 4-H county faculty proficient in the discipline of VAL. While these efforts have been primarily focused on importance of and proficiency in competencies related to volunteer administration and the key characteristics of volunteers, there as been a piece missing. One dimension yet explored, is the prediction of VAL proficiency.

Theoretical Framework

Volunteer Administration

For 44 years The Association for Volunteer Administration (AVA) has been the professional organization supporting the needs of volunteer administrators. The AVA has continued to progress the field as a true profession and is recognized internationally for the wide array of services and resources it provides. This includes the establishment of professional competencies for volunteer administrators that has encouraged many professionals to seek new and challenging educational opportunities (Association for Volunteer Administration, 2001). In 2003, the AVA identified five core competencies of VAL which are (a) professional principles, (b) leadership, (c) management, (d) planning, and (e) human resource management. Competency-based criteria are an important step in developing a profession and Boyd (2003) identified the competencies that professionals in VAL would need in the coming decade as: (a) organizational leadership, (b) systems leadership, (c) organizational culture, (d) personal skills, and (e) management skills.

Stedman and Rudd (2004) developed the theoretical dimension of the discipline including seven key competencies. These competencies were the basis for the development of the Volunteer Administration Leadership Competency Instrument (VALCI) Stedman (2004). Their work integrates both the AVA (2001) core competencies and Boyd (2003) study identifying key competencies for the next decade.

The competencies identified by Stedman and Rudd (2004b) were operationalized as: (a) *Organizational Leadership*: leadership taking place in the context of the organization includes planning and operation at the program level, (b) *Systems Leadership*: leadership involving the expressed knowledge of one's discipline, (c) *Accountability*: knowledge and practice of skills addressing the planning, operation, and evaluation of a volunteer program, (d) *Management Skills*: knowledge and skills addressing the day-to-day operations of a volunteer program, (e) *Personal Skills*: knowledge and skills addressing effective communication and relationship building in volunteer programs, (f) *Organizational Culture*: knowledge and skills addressing positions and relationships within a volunteer organization, and (g) *Commitment to the Profession*: knowledge and skills addressing individual commitment to the field of volunteer administration.

These competencies provided the framework for evaluating southern region 4-H county faculty's volunteer administration leadership perceived proficiency. They also were the basis for determining which competencies were perceived to be important in VAL by 4-H county faculty. Within the CES there has been research examining the needs and desires of extension volunteers from identifying their key characteristics (Culp, 1996), motivation and retention needs (Culp, 1997), advisory board representation (Ingram & Nyangara, 1997), and motivation and recognition needs (Fritz, Barbuto, Marx & Etling, 2000). Additionally, researchers have examined extension faculty's perceptions of volunteer administration models across the U.S. (Culp & Deppe, 2001; Culp & Kohlhagen, 2004; Hange, Seevers, & VanLeeuwen, 2002). Key areas of volunteer administration, including needs assessments, use of job descriptions, resource location and recruitment, were determined to be areas of additional education (Culp, 2001). Hange, Seevers, and VanLeeuwen (2002) were able to show that differences between perception and importance in nine competency areas of VAL existed.

Leadership Styles

In an effort to address the leadership styles of 4-H county faculty in the southern region the researchers were guided by the model of Full Range Leadership (Bass & Avolio, 2000b). Full range leadership specifies that a leader has three styles of leadership, which should guide them in their behaviors; transformational, transactional and laissez faire (Bass & Avolio, 2000b). With transformational being the most effective and active of the leadership styles, followed by transactional and laissez-faire. Bass (1985) developed conceptual models of both transactional and transformational leadership, which were originally derived from Burns' (1978) work.

The Multifactor Leadership Questionnaire developed by Bass and Avolio (2000a) measures three leadership styles based on perceived leadership behaviors. Transformational leadership has four defining behaviors: a) idealized influence (attributed and behavior), b) intellectual stimulation, c) inspirational motivation and d) individualized consideration. Likewise, transactional leadership behaviors include a) contingent reward and b) management-by-exception (active and passive). The MLQ measures laissez faire leadership on a single dimension.

Bass and Avolio (2000b) operationalized transformational leadership behaviors as follows: *Idealized Influence*: leaders display conviction; emphasize trust; take stands on difficult issues;

present their most important values; and emphasize the importance of purpose, commitment, and the ethical consequences of decision. Such leaders are admired as role models; they generate pride, loyalty, confidence, and alignment around a shared purpose. *Inspirational Motivation*: leaders articulate an appealing vision of the future, challenge followers with high standards, talk optimistically and with enthusiasm, and provide encouragement and meaning for what needs to be done. *Intellectual Stimulation*: Leaders question old assumptions, traditions, and beliefs; stimulate in others new perspectives and ways of doing things; and encourage the expression of ideas and reasons. *Individualized Consideration*: Leaders deal with others as individuals; consider their individual needs, abilities and aspirations; listen attentively; further their development; advise; and coach.

Transactional leadership was operationalized as: *Contingent Reward*: leaders engage in a constructive path-goal transaction of reward for performance. They clarify expectations, exchange promises and resources, arrange mutually satisfactory agreements, negotiate for resources, exchange assistance for effort, and provide commendations for successful follower performance. *Management-by-Exception*: Active—leaders monitor followers' performance and take corrective action if deviations from standards occur. They enforce rules to avoid mistakes. Passive—leaders fail to intervene until problems become serious. They wait to take action until mistakes are brought to their attention.

Laissez faire leadership was defined as a non-leadership component—leaders avoid accepting their responsibilities, are absent when needed, fail to follow up requests for assistance, and resist expressing their views on important issues.

Within the CES, research aimed at identifying leadership style of county faculty has become of interest due to the changing goals facing extension programs (Woodrum & Safrit, 2003). With that, measurement instruments like the Leadership Practices Inventory (LPI) (Kouzes & Posner, 1997) and the Multifactor Leadership Questionnaire (MLQ) (Bass & Avolio, 2000a) have proved to be valuable tools in county faculty leadership development (Rudd, 2000; Woodrum & Safrit, 2003).

The theoretical framework of leadership (Bass & Avolio, 2000a) combined with the theoretical framework of VAL (Stedman & Rudd, 2004a) provided a basis for measuring and interpreting leadership behaviors and style, as well as volunteer administration proficiency and importance of 4-H county faculty.

Purpose and Objectives

The purpose of this research was to determine contributing factors to volunteer administration leadership proficiency of 4-H county faculty in the southern region.

The objectives of this study were to:

1. Determine selected demographics of southern region 4-H county faculty,
2. Identify the relationship between selected demographics, leadership styles, and perceived volunteer administration importance and proficiency, and

3. Predict volunteer administration leadership proficiency based on demographics, leadership style and perceived volunteer administration leadership competency importance.

Procedures

This study used a survey research methodology with three questionnaires to collect the necessary information to accomplish the objectives. This is a correlational study with the intent of assessing the predictability of the criterion, perceived volunteer administration leadership proficiency, by demographics, leadership styles, and perceived importance of VAL competencies.

This study was part of a larger national 4-H study, which had the target population of all 4-H county faculty in the United States (Stedman & Rudd, 2004). An accessible population was derived from a random sample of states representing each extension region and then a random sample of 4-H county faculty from the selected states. Dillman's (2000) Tailored Design Method was utilized to minimize sources of error, including coverage, non-response, and sampling error. Sixty-five participants were randomly selected from the southern region to participate in the study. Researchers calculated a response rate of 52% based on this figure (n=34).

Early and late respondents were compared in order to determine if any statistical difference existed (Lindner, Murphy, & Briers, 2001). The double-dipping technique was used to determine if nonresponse was a concern. Miller and Smith (1983) reported late respondents are often similar to early and this was the case when the two groups were compared in this study. Analysis confirmed no significant differences existed between early and late respondents.

The questionnaires used in the collection of data were the Volunteer Administration Leadership Competency Instrument (VALCI), the Multifactor Leadership Questionnaire (MLQ) and a short demographic instrument. The VALCI was designed as a web-administered questionnaire and contained 52 independent statements allowing respondents to provide answers on two levels, perceived proficiency and perceived importance. The questionnaire was divided into seven categories, each addressing one of the seven key competencies of volunteer administration, organizational leadership, systems leadership, accountability, management skills, personal skills, organizational culture and commitment to the profession. Perceived proficiency statements were measured using a Likert-type scale of 1 (Poor) to 5 (Excellent), similarly, the perceived importance statements used a scale of 1 (Strongly Disagree) to 5 (Strongly Agree). Southern region 4-H faculty's competence in volunteer administration was measured using the mean difference between perceived proficiency scores and perceived importance scores. In order to determine reliability of the VALCI perceived importance scale with this sample, Cronbach's alphas for each construct were .78, .82, .83, .90, .78, .78, and .91.

The researcher-developed demographic questionnaire was included with the VALCI for ease of data collection. Demographics included were gender, race, age, and tenure. Questions were included at the end of the VALCI.

The MLQ was a 45-statement questionnaire measuring leadership behaviors and styles (Bass & Avolio, 2000b). Using a Likert-type scale, 0 (Not at all) to 4 (Frequently) respondents self-reported leadership style based on a number of behavior, or factor statements. For the purposes of this study the questionnaire was administered on the web, versus the traditional paper-based form. Bass and Avolio (2000b) reported the reliability of leadership behaviors, or factors, ranging from .74 to .91 and leadership styles, or outcomes, ranging from .91 to .94.

Transformational leadership was measured using 20 statements associated with the behaviors of idealized influence (behavior and attributed), intellectual stimulation, individualized consideration and inspirational motivation. Likewise, transactional leadership was measured using 12 statements associated with contingent reward and management-by-exception (active and passive) behaviors. Laissez faire leadership was measured by four statements, which were identified as passive avoidant. Extra effort was measured using three questions, effectiveness by four questions and satisfaction by two.

Findings

Objective 1. Determine selected demographics of southern region 4-H county faculty

Of the faculty responding, 76.5% (n=26) were women, with 23.5% (n=8) reporting male. Race was categorized into dichotomous variables, white and non-white. There were significantly more white respondents than non-white, (82.4% (n=28) white and 8.8% (n=3) non-white).

The highest percentage of southern region 4-H faculty were under age 30 (26.5%, n=9), with the majority of respondents under age 40 (67.7%, n=23), depicted in Table 1. Tenure, categorized by length of time in extension and length of time as a volunteer administrator, ranged from 1-5 years (32.35%, n=11) to 21-25 years (5.88%, n=2).

Objective 2. Identify the relationship between selected demographics, leadership styles, and perceived volunteer administration leadership importance and proficiency

Pearson product-moment correlations were computed to determine the strength of the linear association between variables. Perceived VAL competence proficiency was found to have relationships with seven variables. Relationship strength was determined using the scale: .00-.19 (Negligible), .20-.49 (Low), .50-.69 (Moderate), .70-.85 (High), and .86-1.00 (High) (Ary, Jacobs, Razavieh, 1996).

With an alpha level of .05 set apriori, seven variables had a significant correlation. There were five variables categorized as having low relationships age, r=.46, p<.05, race, r=.44, p<.05, systems leadership (perceived importance), r=.45, p<.05, accountability (perceived importance), r=.43, p<.05, commitment to the profession (perceived importance), r=.47, p<.05. Two variables were categorized as having a moderate relationship perceived VAL importance, r=.58, p<.05 and organizational culture (perceived importance), r=.57, p<.05. These relationships are summarized in Table 2. Variables associated with leadership style were found to have no significant relationships with perceived VAL competency proficiency.

Table 1
Age of Southern Region 4-H County Faculty (N=34)

Age Range	*f*	Percent	Cumulative Percent
26-30	9	26.5	26.5
31-35	7	20.6	47.1
36-40	7	20.6	67.6
41-45	3	8.8	76.5
46-50	5	14.7	91.2
51-55	2	5.9	97.1
56-60	1	2.9	100.0
Total	34	100.0	

Table 2
Pearson Product-Moment Correlations for Perceived Volunteer Administration Leadership Competency Proficiency and Importance, Leadership Style, and Demographics

	Perceived Volunteer Administration Leadership Competency Proficiency	
Variable	*r*	*n*
Accountability (Importance)	.43*	23
Race	.44*	24
Systems Leadership (Importance)	.45*	24
Age	.46*	25
Commitment to the Profession (Importance)	.47*	24
Organizational Culture (Importance)	.57*	25
VALC (Importance)	.58*	20

*$p<.05$

Objective 3. Predict volunteer administration leadership proficiency based on demographics, leadership style and perceived volunteer administration leadership competency importance

The goal of objective three was to predict perceived volunteer administration leadership competency proficiency based on demographics, leadership style and perceived volunteer administration leadership competency importance. The Pearson product-moment correlations from objective three guided the building of a predictive model. With that, there were seven variables analyzed for their predictability of perceived volunteer administration leadership competency proficiency using stepwise regression. However, due to the low number of respondents, only two variables were analyzed at a time. This process was repeated to determine the model with the greatest level of predictability, R^2.

During analysis, two variables were found to have the greatest predictability on the dependent variable of VAL proficiency. Organizational culture (perceived importance), $\beta=.52$, $t=3.37$, $p<.05$ and age, $\beta=.40$, $t=2.58$, $p<.05$. The completed model had an adjusted R^2 of .43, $F=10.04$, $p<.01$. Table 3 summarizes the findings of the regression model.

Table 3
Multiple Regression Explaining Perceived Volunteer Administration Leadership Competency Proficiency in Southern Region 4-H County Faculty (n=21)

	B	*SE* B	β
Constant	9.53	15.73	
Organizational Culture (Importance)	.60	.18	.52*
Age	2.26	.88	.40*

Note. R^2=.43. *p<.05

Conclusions

Objective 1

In the southern region 76.5% of 4-H county faculty were female. This is much higher than the 66% reported nationally (Stedman, 2004). Male county faculty in the southern region are not as well represented, at 23.5%, versus at the national level (33.0%). However, the southern region is considerably lower in percentage of male 4-H county faculty when compared to the national percentage. 4-H county faculty in the southern region have a higher percentage of non-white faculty (8.8%) compared to the national level (4.2%) (Stedman, 2004). The percentage of non-white faculty members at both the national and regional level is not proportional to the number of 4-H youth reported as non-white (31% national and 40% southern region) (National 4-H Headquarters, 2004).

Southern region 4-H county faculty are younger than their national counterparts, with 47% (*n*=16) 35 years of age and younger compared to 29% (*n*=28) at the national level (Stedman, 2004). Another dimension measured was tenure; tenure represented the length of time in extension and length of time as a volunteer administrator. Similar to the age of respondents, 55.9% (*n*=19) of respondents reported tenure 10 years and less. These two variables, when considered together indicated that 4-H is investing time and energy in acquainting and preparing younger and less experienced faculty for their roles as 4-H county faculty.

Objective 2

The purpose of objective two was to determine the strength of the linear association between the variables, perceived proficiency in VAL competence, perceived importance of VAL competencies, leadership styles, and demographics. Taking into consideration objective three, correlations were identified as they related to VAL proficiency.

There were seven out of twenty-one variables identified as having significant relationships with perceived VAL proficiency. Age was a natural fitting relationship, although low, showing older people report themselves more proficient in this area (*r*=.46). However, tenure, which took into consideration length of time in extension and as a volunteer administrator did not correlate significantly. Additionally, race had a low positive correlation indicating non-white respondents reported a higher level of perceived proficiency (*r*=.44). Organizational culture (*r*=.57) had a positive moderate relationship, providing evidence supporting the importance of knowledge and skills addressing positions and relationships within a volunteer organization. VAL competency importance also correlated highly with perceived proficiency (*r*=.58). This indicated if respondents believed VAL was important, they also believed themselves to be proficient. Individual competencies were systems leadership, accountability, management, organizational culture, and commitment to the profession. Since these contributed to the overall score of VAL competency importance it is evident they would also have some level of relationship with VAL proficiency.

Objective 3

In building a predictive model for perceived proficiency in VAL, there were two key variables, which contributed to 43% of the variability in the model. Age (β=.40, p<.05), contributed to the model and provided a means for addressing the notion that the older an individual is the more proficient they are due to various factors, including more varied experience, education, and practice. Organizational culture (β =.52, p<.05) contained items related to encouraging professional development, confidence in volunteers, seeking additional resources, identifying motivational needs, and designated organizational resources for volunteer development, all items identified as also important in volunteer administration leadership (Stedman, 2004).

However, there should be additional research addressing proficiency. First, the number of respondents brings into question the predictability of the model. In multiple regression a small sample size may introduce questions about the generalizability of the model. The adjusted R^2 value was used to compensate and be conservative due to the smaller sample size. Concern was also raised due to the insignificant constant. It was not determined the impact this had on the predictability of the model because the model was still found to be significant (F=10.04, p<.01).

Recommendations

There are some general recommendations that were derived from the findings and conclusions of this study. These are only recommendations that may be applicable to 4-H county faculty serving the southern extension region.

- There needs to be a stronger initiative to recruit and retain faculty that are more representative of the population that is being served.
- Candidates that are qualified and underrepresented, including men and non-white perspectives, should be sought out and encouraged to apply for opened positions.
- There should be a concerted effort to ensure more in-service educational program opportunities, especially to meet identified needs.
- Implementation of a mentoring program that orients and provides a supportive contact for new or younger faculty members can assist in overall job satisfaction and retention (Kutilek, Gunderson & Conklin, 2002; Zimmer & Smith, 1992).
- Research should address the actual competence of 4-H county faculty versus their self-perceptions of their proficiency.
- Professional development opportunities should be tailored around items related to organizational leadership.

Discussions/Implications

It is important to continue discussions related to the volunteer administration leadership competence and leadership styles of 4-H faculty, nationwide. If volunteer administrator educators are to guide programs based on needs prediction models can provide a great source of information about sources of variation among the learners. However, when there is uncertainty in the validity of the model, researchers must be prepared to continue that effort forward.

As we begin to gain a better of understanding of the effects of these independent variables on VAL proficiency, we can also develop strategies, which integrate these principles into planning. The support for this need is apparent in the number of youth seeking services from 4-H county faculty, this fact has not varied over the years, and remains a driving force of extension program offices. Volunteers are in the position to assist in the reaching of organizational objectives and can assist 4-H in meeting the needs of all their clients and staff.

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FUTURE JOB OPENINGS IN THE FIELD OF AGRICULTURAL EDUCATION AND COMMUNICATION

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Abstract

The decision to attend graduate school is often a difficult and life altering decision. Each person uses different reasoning in deciding whether to take on a doctoral program. The decision is often based on the anticipation of future job opportunities. This study was conducted to ascertain the future job market for doctoral students in the Agricultural Education and Communication profession. Research presented in this paper was obtained from a population of department heads and chairs of Agricultural Education and Communication departments (n=49) throughout the United States. The study collected data regarding the continued need for graduate students in doctoral programs as well as specific academic program areas that will promote the continuation of Agricultural Education and Communication instruction at the post-secondary level. The researchers concluded that the job market for future Ph.D. candidates is positive. The research also implies that there are enough graduate students in programs throughout the country to fill current and anticipated faculty-teaching positions upon completion of their degree. Universities and colleges throughout the country may utilize this study in their efforts to recruit graduate students in program areas that constitute Agricultural Education and Communication departments. Graduate students may utilize this study to make their decision to pursue a graduate degree. Further, this study compiled information in regards to what perspective departments or programs are looking for in their new faculty members. This research provides themes as well as individual components that department heads or chairs are looking for in new hires. The information provided here shows a positive outlook for Ph.D. candidates and Agricultural Education and Communication departments for the future of the profession.

Introduction

There is no way to truly know how many Agricultural Education and Communication teacher educators there are altogether in the United States. “Agricultural” and “Education” are two words that serve as an umbrella, used to describe broad and varied aspects of diverse and multi-faceted departments and programs that in many cases had their beginnings in a narrowly-defined discipline of secondary teacher preparation. The very nature of the two words, Agricultural Education, conjures up a variety of professional interpretations. To some, Agricultural Education is synonymous with Agricultural Science or the science, art, or practice of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products. Agricultural Education programs today have come to encompass not only the education of secondary agriculture teachers, but also include Agricultural Communications, Extension Education, Research, and Agricultural Leadership.

It has been suggested that the Agricultural Education and Communication field is becoming inundated with new Ph.D. candidates. PhD holders may have difficulties finding jobs which correspond to their training (Mangematin, 1999). It has been argued that there are too many individuals seeking advanced degrees and the profession will not have enough university positions for the new graduates. As a result, doctoral granting institutions have reason to re-evaluate policies and procedures used to recruit and place future PhD graduates.

In addition, on the premise that there may not be positions for graduates, individuals might choose not to seek an advanced degree. Certainly not every PhD candidate will seek a university faculty position. There are many career opportunities for graduates that some find more attractive than academics. Yet, the question that begs to be answered is, “Will there be university faculty positions for those interested in pursuing them?”

Theoretical/Conceptual Framework

High school Agricultural Education programs nationwide experienced a continuing shortfall in the number of fully qualified teachers prepared to accept available teaching positions (Camp, 2002.) Dykman (1993) found that institutions granting agricultural teacher education certificates was on the decline. The Agricultural Education classrooms in America are faced with a shortage of new teachers. An estimated 1,175 new agriculture teachers were needed in the nations’ schools in fall of 2001. But, there were only about 693 new graduates looking for teaching positions. Over 300 schools were unable to hire fully qualified teachers of Agricultural Education by the beginning of school in September 2001 (Camp. 2002.) School districts are in need of fully qualified, credentialed agriculture teachers. In order to meet the high demand of these teachers of agriculture to be met, institutions must recruit, train, and supply the educational system with more qualified teachers of agriculture. As more potential teachers of agriculture enter into post-secondary education one would assume that there would be an increased need for post-secondary educators to instruct these new potential teachers. Therefore it can be assumed that there will be more need for university and college faculty members.

Purpose and Research Question

The purpose of the study was to determine future employment opportunities for Ph.D. candidates in Agricultural Education and Communication departments at universities across the nation. Other research questions to be answered by the study included:

1. How many, if any, post-secondary Agriculture Education and Communication teaching positions will there be in the next 1-7 years?

2. What are the academic program areas of Agriculture Education and Communication that university programs will be seeking in the next 1-7 years?

3. How many Ph.D. candidates are in the process of completing a doctoral program?

4. What key hiring elements are Agriculture Education and Communication departments and search committees looking for in new faculty members?

Methods and Procedures

For this study data was collected from a target census population of all post-secondary Agricultural Education Department heads or chairs or their equivalent in the United States. A questionnaire developed by the researchers was used to collect the data. According to Dillman (2000), sample surveys are conducted to "estimate the distribution of characteristics in a population.." The population for this study was determined to provide the best, most accurate and reliable information. The researcher identified names of members of the population from the organizations members list of the American Association for Agricultural Education (Dyer, 2003). University directories and department web sites were utilized to verify specific members of the population if the members contact information was initially inaccurate. Forty-nine of the 79 departments identified responded to the questionnaire, for a return rate of 62%.

The instrument used to collect the data for this study was a researcher-developed, electronic web-based questionnaire. Since the questions on the questionnaire involved responses based on information that was (accurate, ready-made) (Dillman, 2000), the questions did not demand considerable time, thought, nor extreme variations, therefore reliability was not considerably jeopardized. The questionnaire was written and developed using web-page-making software, FrontPage™. Web surveys are conducted in a very similar manner as paper surveys, except that web surveys have the ability to use email as the means of contacting the potential participants. Contacts with respondents via email are an acceptable means of communication (Dillman).

The research questionnaire was entitled, "Future Occupational Positions in Post-Secondary Agricultural Education." The questionnaire consisted of items relating to: the responders department and institution demographics; fifteen questions relating to faculty positions, academic programs offered by the department; anticipated full-time tenure and non-tenure track position openings in the next one to three, three to five, and five to seven years; number of undergraduate, masters, and Ph.D. students enrolled in the department programs; expectant specialty areas for anticipated openings; and the priorities as well as personal and professional attributes sought by Agricultural Education and Communication departments for a new faculty member. The questionnaire was reviewed by an expert panel in agricultural education for face and content validity.

After obtaining contact information detailing the department head or chair for those universities and colleges that are members of the American Association of Agricultural Education (Dyer, 2003), the department head or chair was sent an email outlining the procedures for participating in the study. Questionnaires were sent individually to protect the identity of the responder. Departments or institutions that did not respond were sent a reminder two weeks after the initial mailing. A final request was sent out two weeks following the second mailing to the non-responders for a final round of information collection (Dillman, 2000). The procedures for conducting survey research outlined by Dillman were followed in order to reduce non-response error (Dillman, 2000).

The questionnaire was sent via e-mail formatted in plain text. The e-mail began with a short letter of explanation regarding participation in the research, along with an implied consent statement. The letter explained that all information was confidential and would remain anonymous. The letter continued with directions on how to access and complete the questionnaire. Finally, each department or institution was given an access code along with the web link to the questionnaire. The format of the questionnaire utilized pull-down tab options, button tabs and blank form fields for the open-ended questions.

After completing the questionnaire, the responder clicked the "Submit Information" button, which automatically and electronically sent the completed questionnaire to the researcher via e-mail. The questionnaire results were collected and entered into a Microsoft Excel™ spreadsheet. Data for this research was collected from July 21, 2004 through September 3, 2004. The online questionnaire produced a 62% response rate (n=49).

Summary of Data

Institution Type and Size

Using the American Association for Agricultural Education directory along with college and university websites, 79 possible colleges and universities were identified. Of these 79 colleges and universities 49 responded giving a 62% response rate. Table 1 details the different types of colleges and universities that responded. A Land-Grant institution, Land-Grant universities, or Land-Grant colleges are American institutions which have been designated by a state legislature or Congress to receive the benefits of the Morrill Acts of 1862 and 1890—funding by the grant of federally-controlled land to the states. The mission of these institutions, as set forth in the 1862 Act, is to teach agriculture, military tactics, and the mechanic arts as well as classical studies so that members of the working classes can obtain a liberal and practical education (McDowell). A non land-grant university or college is an institution of higher education and of research, which grants academic degrees. Technical institutes have historically been a term used for colleges that provide mostly job-preparation skills for trained labor, such as welding, culinary arts and office management.

Table 1
Institution Type

Institution Type	*Number of Respondents*
Land-Grant	27
Non Land-Grant	19
Technical Institute	3

The institutions responding to the questionnaire ranged in size from 2,600 to 105,000 students. Department or program populations ranged from 30 to 1,430 students. Students that took courses in the department or programs ranged from 20 to 5,060 per semester.

Department or Program Demographics

The number of faculty positions in Agricultural Education Programs responding was 338.2. The fewest number of positions at an institution was one with the most number of faculty positions being 39. Total number of female faculty positions was 92.3.

Table 2 shows the academic programs offered at the institutions. A teacher preparation program is defined as a program that works to produce and certify competent and qualified teachers. Extension education advances knowledge for agriculture, the environment, human health and well-being, and communities through national program leadership and federal assistance (USDA). Communication programs are designed for educational communicators that emphasize agriculture, the food industry, and natural resources (Journal of Applied Communications). Leadership Education programs are ones that develop critical thinking, communication, global perspectives, responsibility, leadership, and cooperation. (Kellogg Commission on the Future of State and Land-Grant Universities (1997). A research oriented program focuses on the introduction of new knowledge into a field or profession (McDowell).

Table 2
Number of Institutions offering Academic Program

Academic Program	Institutions Offering Program	% of Respondents
Teacher Preparation	48	97.96
Extension Education	20	40.81
Communication	18	36.73
Leadership Education	13	26.30
Research	10	20.41

Note. Other Academic programs that were listed included: Agricultural Technology Management, Agricultural Systems Technology Management, Agricultural Business, Animal Science, General Agriculture, Horticulture, Agriculture Science, Business and Marketing, Family & Consumer Science, Agriculture Science & Technology, Trade & Technical Education, Agronomy, Crop Science, Soil Science, Agriculture Education, Ph.D. Emphasis, Agriculture Science, Agriculture Studies, Technology Ed. in Teacher Education, Ag. Ed.-Agriculture Industry Management and Communication option, Youth and Family Education, Rural Sociology, Health Careers, Adult Education, International Agriculture, Ag. Mechanics & Bio-Systems Engineering, Youth & Family Education, International Agriculture Development, Family & Consumer Sciences Education, Biological Sciences Engineering, Ag.Ed. – Agribusiness option – non-teaching.

Teaching Assignments

Teaching assignments for faculty at the various institutions ranged from strictly teacher preparation to other departments that are solely charged with administrative duties. Several institutions reported that faculty members were assigned to more than one academic program area. Table 3 lists the Full-Time Equivalent hours in each academic program. Full-Time Equivalent (FTE) is a numerical value expressing a percentage of time in hours to a particular position (2001 Human Resources Directory).

Tenure Track Positions

Tenure track positions are positions are college or university positions that have the potential for permanent status pending review after 5-7 years by the Tenure and Promotion committee. It is an avenue of establishing job security for a member of the department as well as proving one's professional integrity as well as commitment to the profession. A tenure track position is one that could result in permanent employability without periodic contract renewals (Merriam-Webster).

Table 3

Full-Time Equivalent (FTE) Faculty

Academic Program	FTE
Teacher Preparation	134.0
Extension Education	67.0
Research	51.4
Leadership Education	32.0
Communication	28.5
Administrative Duties	22.3
FTE Total	335.2

Note. 3 FTE were attributed to a Family and Consumer Sciences Program

Table 4

Anticipated Openings for Tenure track positions in the next 1-7 years

Years	*Number of Openings*
1-3	50
3-5	56
5-7	58
Total	164

Due to circumstances out of the control of the department head or chair, openings in departments fluctuate from year to year. Openings sometimes go unfilled due to budget cuts, lack of qualified applicants or other unforeseen challenges. Table 5 shows the anticipated openings within the next 7 years by academic program area.

Non-Tenure Positions

Fluctuating budgets and varying student enrollment has caused many universities and colleges to become hesitant in offering tenure (permanent) track positions. In virtually all articles examined for this review and related to this research…the decline of federal and state financial support was often sited as a major reason for the downsizing or elimination of vocational teacher education (The Quality of Vocational Education, 1998.) For this reason non-tenure track positions or lecturer positions are common in many institutions nationwide (Hunt, 2003). Table 6 and Table 7 show anticipated openings for non-tenure positions and the program areas for these positions.

Master Students

Table 8 shows the number of students currently enrolled in a masters program. Graduates with a Masters degree may enter into the teaching profession, work for industry, or possibly continue their education in a Ph.D. program.

Ph.D. Students

Ph.D. students choose an academic program option when entering into their doctoral studies. Table 9 depicts the academic program along with the number of doctoral candidates in each program area. A Doctor of Philosophy degree, abbreviated Ph.D., is the highest academic degree one can earn. A Ph.D. requires extended studies. To complete a Ph.D. one must master a subject area as well as extend the body of knowledge about that subject (Wikipedia, 2004).

Table 5
Anticipated Tenure Track Positions in the next 1-7 years by Academic Program Area

Academic Program	Institutions Anticipating Opening	% of Respondents
Teacher Preparation	30	61.22
Communication	15	30.61
Extension Education	15	30.61
Leadership Education	13	26.53
Research	9	18.36
Administrative Duties	4	8.16
Department Head or Chair	13	26.53
* Other	13	26.53

Table 6
Anticipated Openings for Non-Tenure track positions in the next 1-7 years

Years	Number of Openings
1-3	28
3-5	28
5-7	22
Total	78

Table 7
Anticipated Openings for Non-Tenure track positions by academic program area in the next 1-7 years

Academic Program Area	Number of Openings
Teacher Preparation	11
Communication	6
Leadership Education	5
Research	5
Extension Education	4
Department Head or Chair	2
Total	33

Note. Openings were also listed in the following areas: Agricultural Technology Management, Sustainable Agriculture Education and Environment, Agriculture Economics, International Agriculture Development, Curriculum Specialist, FFA Executive Secretary, Lab Technician, Project of various types coordinator.

Priorities for a New Faculty Member

When asked as a department head or chair what they believed to be the priorities for a new faculty member a priority list was generated. The responder ranked the items from the most important to the least important.

Priorities for a new faculty member:

1. Teaching
2. Advising Students
3. Research/Publishing
4. Grant Writing

5. College and University Service
6. Advising Clubs
7. Interdepartmental Cooperation
8. Extension Service
9. Service to State and National Organizations

Table 8
Number of Master students enrolled in each academic program

Academic Program Area	Number Enrolled
Teacher Preparation	558
Extension Education	266
Leadership Education	97
Communication	37
Research	4
* Other	353
Total	1,315

Note. Program areas also listed included: Agricultural Systems Technology Management, Masters of Agriculture, Technology Education, Teacher Education, Rural Sociology, Agriculture Education, Agriculture and Extension Education, Curriculum, Agriculture Science, Education, Agriculture, Family and Consumer Sciences.

Table 9
Number of doctoral students enrolled in each academic program

Academic Program Area	Number Enrolled
Extension Education	83
Teacher Preparation	56
Leadership Education	35
Research	17
Communication	4
* Other	119
Total	314

Note. Additional Ph.D. and Ed.D. programs included: Sustainable Agriculture Education, Agronomy, Horticulture, Curriculum and Instruction, Adult Education, Rural Sociology, Student Development, Agriculture and Extension Education, Bio-technology, Human and Community Development.

Other priorities that were listed by the respondents included:

- International work
- Service to Ag.Ed. family/outreach
- Service learning
- Recruitment
- Focus on unique position description and departmental priorities
- Community service
- Intellectual Growth/Development
- Fill out survey forms on the internet

Key Components Listed as well as Desired in a Job Description for a New Faculty Member

The responder was given the opportunity in an open-ended question to list the five key components they would include in a job description for a new faculty member as well as key items they seek in a newly hired person. Themes that emerged from the questionnaire included:

1. A need for a high level of interpersonal and communication skills. This would include the ability to recruit, counsel, advise and supervise undergraduate as well as graduate students. A new faculty member must have the ability to work as a team player with other members of the department and institution. A new faculty member needs to be able to cooperate and work as a team player. The new faculty member needs to be personable and one who enjoys students.

2. A new faculty member would have previous teaching experience. Teaching experience at the secondary or post-secondary level would be preferred. Teaching of undergraduate and graduate courses in a creative and knowledgeable manner is desired. The new faculty member would be able to use up to date information and technology in their instruction.

3. The ability to conduct research and effectively utilize this research in the profession was a common theme throughout the respondents. The need for current, useful information to augment the instruction at the institutions was continually mentioned. The ability to write grants in order to secure external funding was also seen as a high priority and desirable trait of a candidate or newly hired staff member.

4. Departmental responsibilities were listed as key components of a job description. Telling a perspective new faculty member the expectations of them as a newly hired member of the department was seen as an instrumental hiring practice. A new faculty member must be aware of the responsibilities that they are going to be expected to fulfill upon acceptance of the position.

5. The desire and ability to have continual involvement in the profession was the last theme mentioned throughout this question. Department heads and chairs expressed the desire for new faculty members to continue their personal and professional development. This included being a member of local, state, and national organizations as well as service oriented organizations. Department heads and chairs expressed the desire of their new faculty members to be involved in local, state, and national FFA and 4-H programs and programming.

Conclusions

The findings of this research conclude that there are going to be a significant number of post-secondary openings in the next 7 years in the Agricultural Education and Communication profession. These openings will range from teacher preparation to biological technology, to include positions in Family Youth and Community Services. The anticipated openings in the next 1-7 years for Agricultural Education and Communication Ph.D. graduates will not only include tenure track positions but non-tenure positions.

Secondly, it was found that teacher preparation is an academic program area where a supply of qualified teachers will continue to be needed. In the Agricultural Communications program area it appears that there are not enough doctoral candidates to fill the anticipated need.

Answering the third research question showed that the academic program area needs of universities and colleges can be met by future Ph.D. graduates.

Finally, the key hiring elements desired by department head or chairs of a new faculty member include the ability to work with colleagues, conduct research, write grants, as well as be able to be a successful teacher. The ability to communicate to both students and fellow instructors was deemed an important attribute of a new faculty member.

Implications and Recommendations

The reader is cautioned to apply the findings of this study to the institutions that chose to respond to the questionnaire. Although the data begins to paint a picture of the current status of graduate enrollment and future faculty needs in the Agricultural Education and Communication field it only reflects data from the departments and institutions that responded.

More research in this area is needed. A detailed account of how many Ph.D. candidates in the particular academic program area is needed. Colleges and universities will be able to use the information from this research to develop recruitment plans for their departments. Departments need current estimates of the number of openings for their graduates as well as an accurate needs assessment. It would not serve students to recruit them into a graduate program if there are no career opportunities upon graduation. A question that needs to be asked in future research is, "Where are current Ph.D. graduates getting jobs." This question will assist in determining future need of doctoral students. If all doctoral students are not seeking faculty-teaching positions, where are they being employed? The study found that teaching experience was an important factor for departments when they hire new faculty members. How does age and experience impact the doctoral candidate? What are the recruitment efforts of colleges and universities for their doctoral programs?

Findings of this study imply that currently there is an adequate supply of doctoral students to fill the upcoming need of the Agricultural Education among the institutions that responded to this study. An unknown with serious implications to the profession, is how many of the current doctoral students will seek faculty positions and how many will seek positions in the private sector outside of Agricultural Education? In addition, it is fair to assume that institutions not responding will need to fill faculty positions in the next seven years. Will there be enough graduates to meet the needs as a profession and meet the needs of the private sector?

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CHARACTERISTICS OF CREATIVE COUNTY EXTENSION PROGRAMS IN TEXAS: COMPARISON OF ADMINISTRATIVE PERCEPTIONS TO OBSERVATIONS IN IDENTIFIED CREATIVE PROGRAMS

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Abstract

Interest in creativity has increased in academia and industry. Texas Cooperative Extension now includes creative requisites in county agent performance and promotion measures. A study was conducted in Spring of 2004 to determine characteristics of creative county extension programs. State and mid-level administrators provided their perceptions of creative program attributes via questionnaires. Seventeen creative programs identified by mid-level administrators were examined through informal interviews. Creative attributes perceived by administrators were then qualitatively compared to characteristics revealed through county agent program descriptions. Characteristics identified by administrators varied. The most commonly identified characteristics of creative programs by administrators were reaching new audiences, having a target audience, addressing relevant issues, and using new, non-traditional. Technology, marketing, outside funding, and teamwork were identified at lower levels. Program examination revealed the same characteristics. Examination of agent responses revealed that creative programs typically used a variety of delivery methods, an activity-based component, and multiple teaching experiences in the form of a series or an intensive workshop. Collaboration, targeted marketing, audience convenience factors, and teamwork were also found at higher levels in program examination than in administrative perspectives. Closer inspection of creative programs revealed that sufficient time to plan and implement programs was critical to developing creative programs. Many of the identified programs were outcome programs or interdisciplinary programs which are planned and evaluated at a higher level of scrutiny. The creative programs examined also relied heavily on components of accepted program development models including issue identification, target audience identification, grassroots planning, and evaluation as a framework for success.

Introduction

In the latter part of the twentieth century, interest in creativity has increased in research and in applications of creative thinking in academia and industry (Baker, Rudd, & Pomeroy, 2001; Kvashny, 1982). Creativity is based on divergent thinking, looking at a multitude of ideas, and is sometimes confused with critical thinking which contrastingly centers on convergent thinking or eliminating unreasonable or seemingly impractical possibilities (Beyer, 1987). Creativity is often focused by using Creative Problem Solving (CPS) models that stretch the imagination by alternating between divergent thinking and convergent thinking in each step (Parnes, 1992). In this manner, the CPS process is used to “increase the probability of the generation and implementation of more or deeper relevant interrelationships of the wealth of data our brains contains and continually absorbs” (Parnes, 1992, p. 134). CPS is a way to harness and maximize the creative energies of employees and volunteers and focus efforts to a desired outcome.

Theoretical Framework

Torrance's (1966) classic definition described creativity as a natural human process of sensing incompleteness and/or disharmonies and then engaging in conscious or unconscious activities to resolve the tensions created by this incompleteness. Amabile (1983/1999) took a slightly different approach, explaining that creativity is most often seen in the form of an end product which must be viewed and evaluated contextually.

> A product or response is creative to the extent that appropriate observers independently agree it is creative. Appropriate observers are those familiar with the domain in which the product was created or the response articulated. Thus, creativity can be regarded as the quality of products or responses judged to be creative by appropriate observers, and it can also be regarded as the process by which something so judged is produced. (p. 206)

Creative value according to this definition requires worth not just by the creator, but also by peers, supervisors, team members, or field experts in the case of workplace applications. When creativity is defined as a product, the creative process results in an invention, a scientific theory, an improved product, a literary work, or a new design, etc (Torrance & Goff, 1989/1992).

"Creativity can be considered a function of knowledge, imagination, and behavior" (Parnes, 1992, p. 137). All must be present to maximize creativity. Parnes compared rearranging current knowledge into new patterns to a kaleidoscope. Individuals who achieve new ideas simply from information obtained from one's senses mimic a teleidoscope which uses colors and images from outside to form new patterns. The human brain, however, uses both internal (knowledge) and external (sensory) data in creative problem solving to generate new patterns or ideas like a "kaleido-teleido-scope" (Parnes, 1992, p. 137).

Creativity has been recognized as an important attribute within the Cooperative Extension System (CES) since the mid 1980s with Warnock (1985) calling creativity "Extension's Future" and noting that practically every major innovative extension program was preceded by creative thinking on the part of the researcher or the extension agent. The Futures Task Force to Extension's Committee on Organization and Policy reported that Extension professionals needed a sense of vision, innovation, and/or creativity (Smith, 1988).

Business leaders and managers currently face the challenge of not just releasing and nurturing creative talents, but also focusing them to achieve desired effects or results (Groth & Peters, 1999) which Plesk (1997) termed "directed creativity." Similarly, extension administrators are challenged to focus the creative talents of extension agents to develop innovative and effective programs.

Texas Cooperative Extension (TCE) did not ignore the call to promote creativity. Document analysis revealed that creativity has been added as a performance measure noted in county agent performance appraisal instruments, career ladder promotion criteria, competency models, and the TCE competency model (Womack, 2004). County extension agents are therefore required to be creative and/or innovative in order to excel within the organization.

Adding such terminology to performance standards also necessitates defining criteria of creative programs or creative work. Extension administrators' perceptions and expectations of creative programs need to be examined since they are the "appropriate observers" (Amabile, 1983/1999, p. 206) that judge the creative worth of an extension agents' programs through annual performance appraisals.

Purpose and Objectives

This research focused on the research question, "What constitutes a creative county level program?" It was designed to examine extension administrators' perceptions of characteristics of creative county-level programs. These perceptions were compared then compared the researchers' observations of common characteristics of programs previously identified as creative by mid-level administrators. Discrepancy between administrative perceptions and common characteristics can then be identified and discussed and lead to development of standards for creative programming so that county agents can meet the performance expectations of their supervisors. This research was part of a larger study that also examined perceptions of the value of creativity to Extension along with promoters and inhibitors of creativity (Womack, 2004).

Methods

A census of mid-level and state administrators was conducted using a written questionnaire to determine administrative perspectives of creative programming since administrators evaluate individual performance of agents including creative requisites. State and mid-level administrators were asked to provide written answers to open-ended questions including "what makes a program creative?" Mid-level administrators were also asked to identify two programs which they considered to be both creative and successful, explain what makes them creative, and identify the lead agent(s). These identified programs provided a snowball sample to examine programs that met mid-level administrators' creative expectations. Responses from state and mid-level administrators were randomly assigned an audit trail number beginning with the letters "S" and "M," respectively. Questionnaires were sent electronically using prenotification and follow-up procedures described by Dillman (2000) and responses were returned via email, fax, traditional mail, and phone transcription of answers resulting in 100% response rate.

Seventeen programs identified as creative were examined using informal interviews conducted via telephone or Internet conferencing with the lead agents for those programs to determine common characteristics. Agents were simply asked to describe the identified programs. The interviewer asked for elaboration or used branching questions when alerted to certain cues such as pauses or tone fluctuations in the respondent's voice. Such probing continued until the interviewer had an accurate understanding of the respondent's thoughts or feelings. Interviews were transcribed and subjected to member check procedures for accuracy. Responses from county agents were randomly assigned an audit trail number beginning with the letter "A."

Data from administrative questionnaires and county agent interview transcripts were unitized, sorted into emergent themes, and analyzed using accepted qualitative means (Lincoln &

Guba, 1985; Berg, 1998). Data from administrators and county agents were compared to each other. Triangulation was used to ensure trustworthiness of data sources. Each piece of data was confirmed using an alternate source including literature, organizational reports, and other documents.

Findings

A wide range of adjectives were used to describe programs by both administrators and county agents. Although administrators were directly asked "what makes a program creative," responses from county extension agents were derived from descriptions of their respective program and how creativity related to the planning process. Descriptors of creative programs and/or their components were "new," "unusual," "original," "innovative," and "out of the box." Although not specifically asked to define creativity, county agents also used "out of the box" to describe creative programs.

The most common description reported by administrators was the belief that an idea or subject did not have to necessarily be new, but could be presented with a different method that departs from routine. Typical quotes within this theme described creative programs as "any program that departs from traditional approaches, yet adheres to sound research-based methodology and subject matter" (M8), or using a "non-traditional approach to teaching a traditional audience" (M20), by "putting new/fresh approaches on old, familiar programs" (M21). Similarly, more than one-half of the agents agreed with administrators that creative programming did not have to be a new program, but strictly a new twist on materials.

Some of the programs initially submitted did not provide much insight into what made the program creative by the mid-level administrators' descriptions. A peer reviewer with experience in extension program development and evaluation noted that eleven of the forty-two programs that were nominated by the initial response deadline appeared to be very effective or successful, but not necessarily creative based on his interpretation of the administrators' explanations. This confusion was supported by use of descriptors like "effective," "productive," and "quality" by 22% of administrators when describing what makes a program effective.

The descriptors above served as a precursor with administrators continuing to identify specific criteria they commonly associated with creative programs. The descriptions by county agents that were responsible for creative programs identified by administrators were also examined to compare characteristics. Table 1 compares the administrative expectations to the observed characteristics of creative programs identified through county agent interviews. Characteristics fell within broad themes relating to the audience factors, program development and planning process, delivery methods, and other considerations. Analysis of the data revealed

Table 1.
Perceptions of Common Characteristics of Creative Programs

Common Characteristics	Administrators (%)	Agents (%)
Audience Factors:		
Target Audience	40.5	94.1
New Audiences/Broad Appeal	81.1	66.7
Audience Convenience Factor	2.7	58.8
Program Planning:		
Relevant Issue	43.2	76.5
"Grassroots" Planning Group	32.4	58.8
Evaluation / Planning Model	21.6	47.1
Time to Plan & Implement	32.4	76.5
Outcome Program	---	23.5
Interdisciplinary Program	---	35.3
Delivery Methods:		
New, Non-traditional Method (s)	43.2	76.5
Multiple Delivery Methods	16.2	88.2
Activity Based Component	2.7	82.4
Technology Component	13.5	29.4
Multi-generational Component	---	29.4
Bilingual Component	---	17.1
Educational Program Series	---	64.7
Workshop or Conference	---	17.7
Collaboration	10.8	94.1
Catchy Name or Logo	2.7	58.8
Marketing Component	24.3	47.1
Outside Funding / Grants	35.1	52.9
Teamwork (staff/volunteers)	32.4	41.2

that creative programs effectively used components of the program planning process including target audience identification, needs assessment, grassroots planning, and evaluation.

Audience-related characteristics including audience identification and attracting new audiences were common responses in descriptions of creative programs for both administrators and county agents. Identification of a target audience was a characteristic described in 94% of the creative programs examined; however, only 19% of administrators specifically used the words "target audience" when explaining attributes of creative programs. Other administrators described creative programs as satisfying the specific needs of an audience which was interpreted as the concept of a target audience within explanations about the value of creative programs. A similar characteristic specifically identified by 67% of administrators as an element of creative programs was attracting new audiences or having broad appeal. Audience convenience factors like special locations, weekend and evening times, and Internet access to information were noted in 59% of the programs, and surprisingly only one administrator even acknowledged the importance of this factor by suggesting that creative programs be "user-friendly" (M31).

Program planning characteristics identified by both administrators and seen in program examinations included addressing relevant issues, grassroots planning, evaluation and program evolution, and adequate time to plan and implement creative programs. Issue-based programming was a criterion for effective creative programs according to 43% of administrators; it was also observed in 77% of the programs examined.

Grassroots involvement is one of the cornerstones of accepted program development models in Extension. Grassroots planning was specifically mentioned as a characteristic or as a promoter of creative programs by 32% of administrators. “I think most creative and successful programs are identified and developed through local committees that are very familiar with the issue to be addressed, but have very little knowledge of how traditionally Extension or other groups addressed similar issues...committees should have a variety of personality types to stimulate new ideas and creative solutions” (M23). Similarly, 53% of county agent responses also revealed the importance of grassroots committee planning. According to county agents, committees provided a plethora of viewpoints during the program planning process. Agents related that effective committees can bring in “new blood and new ideas, new thoughts of how to do things or what to do” (A6). If an agent can “take some of those ideas and merge them, [they] can really produce some outstanding creativity” (A3). Simply having a committee did not appear to be sufficient, but having the right members on that committee was identified as equally important. Committees were also recognized as an inhibitor when they are steeped in tradition and resist change. “If you have committees that have been around for twenty or thirty years, ...unless they themselves are very...active and open to new ideas, then I think that’s going to make it hard for you to do your work or maybe to identify areas where you can maybe branch out” (A9).

Another similar way to increase the divergent thinking and to keep programs relevant is by “making sure you’re in contact with the people who need it” (A5) which may include “going out and mingling with people in the industry” (A15). A creative agent stays relevant by “paying attention to trends...[and] what people are seeking and looking for...a whole lot of that we’ve got to get from asking people. They’ll tell you ...what they want...it’s just a matter of figuring out a way of adapting what they are telling you into a program” (A10). One agent explained part of his needs assessment process. “I polled a bunch of [target audience] and asked them, ‘What do you need from Extension? What are your greatest needs and how can we help?’ which is always a dangerous thing to do, but they were very responsive” (A16).

Program evolution and adaptability often occurs through effective use of evaluation. Evaluation allows for improvement in ongoing or repeated programs, a characteristic of 84% of the programs examined. Planning and implementing such improvements requires additional time. Similarly, agents reported that additional planning was devoted to interdisciplinary and outcome programs.

Incorporating innovative, unique, or non-traditional methods was mentioned by 43% of administrators. “Usually it is not that the information is particularly new, but that a new way of presenting it is utilized” (M17). However, administrators did not define terms like “unique” or “non-traditional” nor did they give examples.

A common characteristic seen in the 88% of the creative programs examined was use of multiple delivery methods within a program. A plethora of learning experiences was identified including use of lecture, demonstration, field trips and tours, hands-on experimentation, self-directed projects, case studies and investigation, medical tests and results interpretation, newsletters, websites, mentoring, public speaking, and community service. A common thread in delivery methodology, however, was active-learning or hands-on experiences which were identified as a critical component in 82% of the programs. Technology was mentioned as a common element in creative programs by only 14% of administrators and only 24% of examined programs identified a technology component. Other methodology characteristics that were seen at much lower levels included a multi-generational facet and a bilingual component.

Another common theme found in most of the identified programs was the use of multiple learning experiences and not strictly single presentations. An educational program series was used in 65% of the creative programs studied. Intensive study with multiple presentations and experiences through a conference, retreat, or short-term camp were used in an additional 18% of the programs.

Collaboration was markedly present in 94% of the programs examined but not identified as a characteristic by administrators specifically. Other characteristics were less common. A marketing component was identified by administrators, including such things as a catchy logo or name in 59% and special marketing/promotional efforts used by 42% of the programs examined. Grant support of outside funding was noted by 35% of administrators and in 53% of the programs. Teamwork including support by co-workers and/or volunteers was identified by 32% of administrators and in 41% of the programs.

Conclusions

The researchers observed from written responses that state administrators generally provided more complete explanations of what makes a program creative. Few mid-level administrators were able to provide clear, concise answers to “what makes a program creative.” The variety within answers suggested that creative expectations are poorly defined for county agents and vary depending on the supervisor.

Lack of effective description of specific creative programs and use of terminology such as “effective,” “productive,” or “quality” by 22% of administrators suggests that some mid-level administrators might have difficulty deciphering between creative and successful programs.

The terms “new,” “unusual,” “original,” or “different” were used to describe an overall program, approach, or method. However, most administrators and agents explained that a creative program may not have new subject matter but simply deliver material using a new method that departs from routine or tradition. Administrative perceptions of creative methods may be more easily defined by listing traditional methods such as lecture or visual demonstration. Extension literature supports the use of innovative program delivery methods (Taylor-Powell & Richardson, 1990) and new approaches and tools to improve Extension’s effectiveness (Warner, 1993).

A creative program incorporates innovative, unique, or non-traditional methods according to 43% of administrators. One mid-level administrator explained, "Most often when we think of creative programming it is the delivery methods that are creative" (M17). That statement aligns with performance appraisal measures requiring "creative and innovative methods" (Texas Agricultural Extension Service, 2000, p. 20). However, since less than one-half of administrators identified delivery methods as a characteristic of creative programs, one might wonder if the administrators consciously recognize that using creative and innovative program delivery methods is one of the evaluation standards for county agents.

A variety of delivery methods were used in the seventeen programs examined with most using multiple methods. The use of active learning seen in 65% of creative programs might suggest that traditional methods may be more passive delivery methods including lectures and distribution of printed publications and newsletters.

Although technology is specifically mentioned in performance appraisal standards, technology use was not prevalent in program descriptions. However, concerns were voiced by both administrators and agents that Extension may be behind the technology adoption levels of clientele. It was also noted that providing clientele with more on-line learning experiences might help Extension appear technologically savvy and relevant. Technology was also suggested as a venue to provide information to computer-literate clientele who seek assistance after traditional work hours. Concerns were voiced about potential clientele going elsewhere for information if they could not find it on-line on demand. Therefore, it might be beneficial to incorporate technology as one of the multiple methods in programs to assist Extension in meeting its mission to provide quality, relevant outreach and continuing education programs and service to the people of Texas. Extension should therefore carefully examine the best applications of technology to meet the needs of clientele.

Collaboration is another performance standard, but was surprisingly missing in the descriptions of creative program criteria by administrators. One or more major collaborators were identified in 94% of the creative programs examined. Collaborators provided facilities, financial support, personnel support, or significant assistance in planning. The lack of administrative acknowledgment may stem from collaboration being a performance standard and thus assumed to be part of programs; however, its appearance in the vast majority of programs studied warranted its inclusion in creative programming criteria.

Marketing and promotion was identified as a component or promoter of creative programs by 22% of mid-level administrators and was seen in 47% of the programs. Targeted marketing and specific promotional components may be considered creative due to deviation from traditional Extension program promotion. Creativity and divergent thinking may help to expand the marketing efforts of all extension programs. This conclusion was supported by the report of the TAEX Urban Task Force Subcommittee on Expansion which recommended finding readily identifiable banner programs along with an internal and external marketing plan (Texas Agricultural Extension Service, 2001).

The researchers also noted that program development models provided a framework for creating a successful, relative educational program with measurable impacts in the creative programs examined. Administrators' descriptions of creative program criteria mirrored elements commonly found in widely accepted extension program development models. One or more of the common program development elements (issue identification, target audience identification, grassroots planning, and evaluation) were apparent in the creative programs examined.

Use of committees and grassroots efforts in program planning was one of the key components discussed by both administrators and agents for an influx of ideas. When used effectively, committees and task forces provide the source for divergent thinking during program planning and allow Extension to bring in the ideas and resources of collaborators. These findings are supported by Parnes' (1992) "kaleido-teleido-scope" effect where new patterns and combinations are made from both internal and/or external elements.

Recommendations and Implications

The linkage between creative programming and successful or effective programming is a natural association for administrators and managers who are looking at productivity as one of the measures of the organization. Extension administrators face the same challenges as industry leaders and managers of not just releasing and nurturing creative talents, but also focusing them to achieve desired effects or results (Groth and Peters, 1999). However, guidelines that distinguish creative programs from simply traditional, successful programs need to be further clarified since agent performance and promotion measures are specifically linked to creative programs.

Diverse delivery methodologies were reported to be a key element of creative programs. In an effort to identify creative methodologies, providing a list of specific creative techniques might actually limit creativity; a better approach would be to create a list of methods that are typically considered traditional. Recognizing creative programs and having agents share their creative successes would provide examples for other agents and promote creativity within the organization.

Creativity should be promoted within the organization since creative products are required of employees according to performance and promotion measures. Furthermore, creativity appears to be linked to organizational and professional excellence according to responses by administrators, agents, and literature.

As agents pointed out during interviews, many creative programs already exist in counties, but concerns are still apparent that agents may be stretched too thin. The ability to produce exceptional extension programs will not come from expecting miracle performance in increasingly demanding situations, but when agents are provided the time and resources to adequately develop programs and reach their creative potential.

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CHALLENGES OF SERVICE-LEARNING IN TENNESSEE 4-H YOUTH DEVELOPMENT: A DELPHI STUDY

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Abstract

Service-learning is growing in popularity as a methodology for teaching youth life skills and 4-H project knowledge. Through a modified Delphi technique, a panel comprised of 4-H'ers, volunteers, and agents in Tennessee identified challenges of utilizing service-learning to fulfill the mission of the state's 4-H Youth Development program. The subpanels of 4-H youth, volunteers, and Extension agents found that primary challenges of conducting service-learning projects through 4-H Youth Development include coordination; working around everyone's schedule; and funding. There were some differences among the subpanels' lists and prioritization of the challenges. The study has implications for 4-H leaders, both youth and adult, who employ service-learning as a teaching tool.

Introduction/Theoretical Framework

Since its inception in 1902, the 4-H Youth Development program has outlined community service as one of its primary objectives. In October 2000, Tennessee 4-H Youth Development expanded that service commitment to include service-learning, a form of experiential education where youth apply knowledge, skills, critical thinking, and wise judgment to address genuine community needs (Toole & Toole, 1994). Service-learning is a growing methodology for fulfilling the 4-H mission of helping youth develop skills and attitudes they need to become successful adults. After receiving a 3-year grant from the Tennessee Commission on National and Community Service and Learn and Serve America, the Extension Service began a statewide initiative to infuse service-learning throughout the 4-H Youth Development program (Mantooth & Hamilton, 2004). The program provided training and resources for youth and adults, as well as opportunities for funding and recognition for projects. From October 2000 until December 2003, more than 182,000 4-H'ers partnered with 14,800 adults to conduct 5,300 service-learning projects, benefiting more than 901,000 people through 585,000 hours of service (Mantooth & Hamilton, 2004).

Nationally, service-learning can trace its theoretical roots to John Dewey, Alexis de Tocqueville, William James, and Thomas Jefferson, as well as historical movements such as the push for civil rights in the 1960s (Waterman, 1997a). Dewey is credited with conceptualizing ideas of experiential education and reflective thinking, both vital components of service-learning. Dewey's work also provided the foundation for key elements of service-learning, such as student involvement in developing learning objectives, working cooperatively on learning tasks, linking what is learned to personal experience, placing importance on social and not just intellectual development, and valuing actions for the welfare of others (Kraft, 1996).

In 1910, American philosopher William James called for a program of national service for youth that would serve as the moral equivalent of war, something that would speak to men's souls as universally as war did and yet be compatible with their spiritual selves (Waterman, 1997a). The Twentieth Century saw many large-scale efforts to engage youth in service, including the Civilian Conservation Corps, the Peace Corps, Volunteers in Service to America , the Youth Conservation Corps, and other organizations that sought to benefit the volunteers who were serving their communities (Corporation for National and Community Service, n.d.; Kraft, 1996; Pritchard, 2002; Waterman, 1997b). Additionally, service-learning gained national attention with the passage of the National and Community Service Trust Acts of 1990 and 1993.

This legislation established the Corporation for National and Community Service (CNCS), a federal agency that provides grants for both school-based and community-based service programs. School-based service-learning is organized as part of the academic curriculum of an elementary or secondary school or an institution of higher education, whereas community-based service-learning is organized through a community agency or youth-serving organization (National and Community Service Trust Act of 1993). While much attention has been given to school-based service-learning, community-based efforts have also grown over the past 10 years. The CNCS has awarded more than $37 million to community-based organizations and state service commissions, and a substantial amount of community-based service-learning is occurring beyond what is funded through the CNCS (Bailis & Lewis, 2003).

The number of youth engaged in service is increasing. Skinner & Chapman (1999) revealed that 64% of all public schools had students involved in service activities recognized and/or arranged through the school, and 32% of all public schools organized service-learning as part of their curriculum. Shumer and Cook (1999) reported that 6.1 million high school students were involved in service-related programs in 1997, and Safrit and Auck (2003) found that 98% of Ohio 4-H'ers had voluntarily helped others within the previous year.

The increasing number of youth involved in service-learning has sparked a growing field of research on the impact of service-learning. Because the youth engaged in service-learning are often outside the classroom, interacting with community members and organizations, impacts of service learning are not limited to youth. Indeed, researchers (Billig, 2000; Scales & Leffert, 1999; Melchior, 1999) have found an impact on youth, schools and community organizations through which they work, and communities they serve.

Youth participating in service-learning programs, both school-based and community-based, show increased self-esteem and problem-solving skills, more positive attitudes toward adults, and increased concern for others' welfare (Scales & Leffert, 1999). Service-learning also has a positive impact on students' civic attitudes and participation, particularly if students remain active in organized service activities (Melchior, 1999). Other benefits of service-learning include more positive perceptions of youth by community members, increased school cohesiveness, and improved services to clients of community agencies (Billig, 2000b; Melchior, 1999).

Despite the benefits researchers have found, challenges can often hinder the effectiveness of service-learning. Shumer (1997), Wade (1997), and Ogden (2002) observed challenges with implementing service-learning in both school-based and community-based programs. Service learning required more planning time, more coordination with community organizations and partners, and more administrative support (Shumer, 1997; Wade, 1997). Other challenges included lack of leverage on the part of youth, lack of time, and lack of sustainable funds (Ogden, 2002).

Despite the number of community-based organizations that are engaging in service-learning and the increasing amount of research in the field, "community-based service-learning is the least understood and least studied of the streams of service-learning" (Bailis & Lewis, 2003, p. 17). Therefore, understanding the challenges of service-learning in community-based organizations, particularly 4-H Youth Development, is a problem due to the lack of research on community-based service-learning.

Purpose and Objectives

The purpose of this study was to identify challenges of service-learning in Tennessee 4-H Youth Development. Furthermore, the researchers sought to describe perceived differences among three subgroups: 4-H members, volunteers, and Extension agents.

Procedures

Researchers used the modified Delphi technique with a panel of experts to generate data for the study. The Delphi technique is a method of group communication that is effective in allowing a group of experts, as a whole, to deal with a complex problem (Linstone & Turoff, 1975). The technique uses sequential questionnaires developed through summarized information and feedback of opinions from earlier responses (Delbeq, Van de Ven, & Gustafson, 1975).

Panel members (n = 30) were purposefully selected from individuals who served as youth coordinators, adult volunteer coordinators, or Extension contacts for 10 service-learning projects funded by 4-H Seeds of Service mini-grants between April 2001 and October 2003. The panel consisted of 10 4-H members, 10 adult volunteer leaders, and 10 4-H agents. The members represented the four districts of the University of Tennessee Agricultural Extension Service, providing statewide scope to the study. Youth, volunteers, and Extension agents comprised separate subpanels due to the groups' varying developmental level, focus, needs, and experience with service-learning.

The researchers administered a series of three questionnaires to participants. The first questionnaire consisted of an open-ended question—"*The challenges of conducting service-learning projects through 4-H Youth Development are . . .*"—that generated a list of benefits of service-learning implemented through the 4-H Youth Development program. The researchers summarized responses from the first questionnaire and eliminated any duplicate responses. Three, second-round questionnaires, one for each subpanel, were developed from the responses provided in round one. The second-round questionnaires asked participants to rate responses on a Likert-type scale of 1 (most important) to 9 (least important). The third round questionnaires ranked the responses to each question from most important to least important by arithmetic mean. Panel members were provided with the subgroup's mean and their own rating for each item. In addition, they were asked to explain why they disagreed with the rankings, if they did. A panel of experts, consisting of three faculty members and two 4-H Youth Development specialists, determined face and content validity for each instrument. Dalkey (1969) stated that the reliability was greater than .80 when the Delphi group was larger than 13.

First round questionnaires were mailed to study participants. Participants had the option of responding through a paper copy or Web-based questionnaire. Subsequent questionnaires were distributed to panel members either through the mail or e-mail, based on respondents' preferred method of receiving correspondence as indicated through the first Web-based questionnaire.

In round one, 18 panel members responded through the on-line questionnaire and 7 mailed or faxed their questionnaires, providing an 83% (n = 25) response rate. The 4-H youth subpanel had a 60% (n = 6) response rate; the volunteer subpanel had a 90% (n = 9) response rate; and the Extension agent subpanel had a 100% (n = 10) response rate. Responses from the three subgroups were maintained separately. Data generated by youth panel members were not considered until signed informed consent statements were on file with the researchers.

The 4-H youth subpanel (n = 6) generated 51 statements, which were summarized to 21 challenges. The volunteer subpanel (n = 9) generated 64 statements, which were summarized to 25 challenges. The Extension agent subpanel (n = 10) generated 75 statements, which were summarized to 21 challenges.

In round two, 20 panel members responded on-line, and 4 mailed or faxed their surveys, providing an 80% response rate. The 4-H youth subpanel had a 70% (n = 7) response rate; the volunteer subpanel had an 80% (n = 8) response rate; and the Extension agent subpanel had a 90% (n = 9) response rate. As with the first questionnaire, responses from the subgroups were maintained separately.

The researchers calculated the arithmetic mean and standard deviation for each response. Mean scores of the round two questionnaires were used to determine importance of each statement. Responses were categorized as "important" (1 – 2.49), "slightly important" (2.5 – 4.99), "uncertain" (5 – 5.99), "slightly unimportant" (6 – 7.49) or "unimportant" (≥ 7.5). Standard deviation of ≤ 1.5 indicated that consensus was reached within the subpanel. These data were used to develop the third and final round of questionnaires.

Twenty-two panel members responded on-line, and three mailed their surveys, providing an 83% response rate to the third questionnaire. The 4-H youth subpanel had a 70% (n = 7) response rate; the volunteer subpanel had an 80% (n = 8) response rate; and the Extension agent subpanel had a 100% (n = 10) response rate. Responses from the subgroups were maintained separately.

Findings

In this study, a purposefully selected panel of 4-H youth, volunteers, and Extension agents was utilized to generate and prioritize challenges of conducting service-learning projects in Tennessee 4-H Youth Development.

Challenges Identified by 4-H Youth Subpanel

The 4-H youth subpanel rated the importance of 21 challenges of conducting service-learning projects through 4-H Youth Development. The mean and standard deviation for each statement are recorded in Table 1. The statements are prioritized in order of most important to least important by average arithmetic mean scores. The 4-H youth subpanel reached consensus on four of the six challenges ranked as "important." Some of these statements include *working around everyone's schedule* (M = 1.85, SD = 0.89); *not having enough time* (M = 2.14, SD = 0.90); and *maintaining good communication among all parties* (M = 1.86, SD = 1.07).

Table 1
Delphi Study Round Two: Prioritized List of Challenges Identified by 4-H Youth Subpanel (n = 7)

	Challenge	M	SD
1.	Working around everyone's schedule.	1.85	0.89[a]
2.	Maintaining good communication among all parties.	1.86	1.07[a]
3.	Not having enough time.	2.14	0.90[a]
4.	Getting others involved and keeping them motivated and dedicated.	2.29	1.50[a]
5.	Lack of funding.	2.43	1.62
6.	Planning and budgeting.	2.43	1.72
7.	Logistics – planning and making sure everything is going as planned.	2.57	0.98[a]
8.	Organizing the group and keeping everyone on schedule.	2.57	1.27[a]
9.	Finding enough volunteer leaders.	2.57	1.72
10.	Disagreements within the group; getting everyone heard without feelings getting involved.	3.00	1.60
11.	Selecting a quality (truly meaningful) project that everyone wants to do.	3.00	1.73
12.	Equipment – getting, storing, setting up for project.	3.29	1.11[a]
13.	People not reporting to work.	3.29	2.43
14.	Organizational difficulties.	3.43	1.27[a]
15.	Being able to find other organizations to help.	3.43	1.71
16.	Having one person responsible for keeping records and scheduling projects.	3.57	0.98[a]
17.	Paperwork; keeping records.	4.00	1.63
18.	Having people who do not appreciate what you're doing.	4.43	2.57
19.	Publicity.	4.57	2.30
20.	Having someone talk bad about you and the project.	4,89	2.73
21.	Missing other activities and time with family and friends.	5.14	2.27

Note. Likert scale: 1 – 2.49 = Important; 2.5 – 4.99 = Slightly Important; 5 – 5.99 = Uncertain; 6 – 7.49 = Slightly Unimportant; ≥ 7.5 = Unimportant.
[a] Consensus of Group.

In round three, five 4-H youth subpanel members indicated disagreement with the ranking of six statements. Panel members responded in favor of higher importance for the challenge of *getting others involved and keeping them motivated and dedicated*. Panel members thought three statements should be ranked less important: *people not reporting to work, being able to find other organizations,* and *publicity*. Two statements, *having people who do not appreciate what you're doing* and *having someone talk bad about you and the project*, received opposing comments. All respondents' comments were based on their personal experiences with service-learning.

Challenges Identified by Volunteer Subpanel

The volunteer subpanel rated the importance of 25 challenges of conducting service-learning projects through 4-H Youth Development. The mean and standard deviation for each statement are described in Table 2. The statements are prioritized in order of most important to least important by average arithmetic mean scores. The volunteer subpanel reached consensus on five of the six challenges ranked as "important." Some of these statements include *coordination, working around everyone's schedule* (M = 1.57, SD = 0.53); *keeping up motivation, interest, participation, and commitment* (M = 1.71, SD = 0.95); and *filling out paperwork for the project* (M = 2.00, SD = 1.15).

Table 2
Delphi Study Round Two: Prioritized List of Challenges Identified by Volunteer Subpanel (n = 8)

	Challenge	M	SD
1.	Coordination; working around everyone's schedule.	1.57	0.53[a]
2.	Keeping up motivation, interest, participation, and commitment.	1.71	0.95[a]
3.	Filling out paperwork for the project.	2.00	1.15[a]
4.	Funding; having difficulty getting supplies/equipment.	2.29	1.25[a]
5.	People not showing up to work.	2.29	1.60
6.	Learning how much is too much to undertake within a project.	2.38	1.19[a]
7.	Getting enough adults involved.	2.38	2.00
8.	Knowing the difference in a need and what would just be a fun time.	2.50	1.69
9.	Knowing how to measure the success of the project/program.	2.71	1.38[a]
10.	Missing other activities; spending time away from family and friends; falling behind in other tasks.	3.00	2.16
11.	Getting enough teens involved.	3.00	2.31
12.	Time limits; having time to complete the project; meeting deadlines.	3.14	2.41
13.	Picking a project with an impact on a large number of people.	3.57	1.13[a]
14.	Transportation.	3.57	1.27[a]
15.	Getting group to "buy in" and understand project goals and objectives.	3.57	1.98
16.	4-H'ers not getting along.	4.42	2.14
17.	Volunteers not having a good connection with the instructor.	4.50	2.39
18.	Volunteers thinking they do not get enough help on their project.	5.38	2.45
19.	Having a place to meet.	5.71	1.97
20.	Volunteers thinking the project is different than they expected.	5.75	1.91
21.	Volunteers finding out they are not "cut out" for this.	6.38	2.00
22.	The weather.	6.43	1.90
23.	Volunteers becoming bored because the project takes too long.	6.43	2.30
24.	Volunteers thinking they have "been there, done that!"	7.25	1.75
25.	That the project doesn't challenge volunteers enough.	7.50	1.85

Note. Likert scale: 1 – 2.49 = Important; 2.5 – 4.99 = Slightly Important; 5 – 5.99 = Uncertain; 6 – 7.49 = Slightly Unimportant; ≥ 7.5 = Unimportant.
[a] Consensus of Group.

In round three, four volunteer subpanel members indicated disagreement with the ranking of 13 statements. Panel members responded in favor of higher importance for the challenges of *getting enough adults involved* and *getting enough teens involved.* Panel members responded that 11 statements should be ranked less important: *getting group to "buy in" and understand project goals and objectives, 4-H'ers not getting along, volunteers not having a good connection with the instructor, volunteers thinking they do not get enough help on their project, having a place to meet, volunteers thinking the project is different than they expected, volunteers finding out they are not "cut out" for this, volunteers becoming bored because the project takes too long, volunteers thinking they have "been there, done that!,"* and *that the project doesn't challenge volunteers enough*. All respondents' comments were based on their personal experiences with service-learning.

Challenges Identified by Extension Agent Subpanel

The Extension agent subpanel rated the importance of 21 challenges of conducting service-learning projects through 4-H Youth Development. The mean and standard deviation for each statement are described in Table 3. The statements are prioritized in order of most important to least important by average arithmetic mean scores. The Extension agent subpanel reached consensus on the three challenges ranked as "important." These statements were *working around everyone's schedule* (M = 1.89, SD = 0.78); *funding* (M = 1.80, SD = 1.03); and *time* (M = 1.80, SD = 1.03).

In round three, three Extension agent subpanel members indicated disagreement with the ranking of two statements. Panel members responded in favor of higher importance for the challenges of *funding* and *doing follow-up projects*. All respondents' comments were based on their personal experiences with service-learning.

Conclusions

The three subpanels generated several statements with similar content. These challenges included *working around everyone's schedule, lack of funding, not having enough time*, and *missing other activities and time away from family and friends*. Also, the subpanels generated several statements related to the challenge of planning or logistics and selecting the best project.

Although the subpanels generated many of the same challenges, there were differences among the subpanels' lists and prioritization of challenges. For instance, the 4-H youth and Extension agent subpanels had similar views on the challenge of *not having enough time*; however, the volunteer subpanel did not reach consensus on this challenge. In addition, the youth and volunteer subpanels expressed similar views on the challenge of *getting participants and keeping them motivated and dedicate*d, whereas the Extension agent subpanel did not reach consensus on this challenge. Furthermore, the volunteer and Extension agent subpanels, but not the 4-H youth subpanel, reached consensus on the challenge of *funding*.

The 4-H youth subpanel generated one challenge that the other subpanels did not. This statement was *equipment—getting, storing, setting up for project*. The volunteer subpanel had nine statements that were unique from the challenges generated by the other subpanels. These statements included *knowing how to measure the success of the project/program, getting the group to "buy in" and understand the project goals and objectives,* and *volunteers thinking they* *do not get enough help on their project*. The Extension agent subpanel had eight statements that were not generated by the other subpanels. Some of these statements were *doing follow-up projects, helping others without embarrassing them or hurting their feelings, that service-learning takes too long and/or is too difficult,* and *peer pressure*.

Table 3
Delphi Study Round Two: Prioritized List of Challenges Identified by Extension Agent Subpanel (n = 10)

	Challenge	M	SD
1.	Funding.	1.80	1.03[a]
2.	Time.	1.80	1.03[a]
3.	Working around everyone's schedule.	1.89	0.78[a]
4.	Time away from family and other responsibilities.	2.70	1.64
5.	Getting participants and keeping youth involved/motivated until the end of the project.	2.70	1.94
6.	Organizing project logistics (location, bad weather alternative, liability, etc.)	3.00	2.26
7.	Youth not following through with their responsibilities.	3.30	1.42[a]
8.	Getting support/commitment from adults and the community.	3.50	2.68
9.	Working in a youth/adult partnership; letting youth take leadership for the project.	3.70	2.30
10.	Doing reflection and getting youth to understand the importance of reflection.	3.80	2.26
11.	Getting them to report their accomplishments.	3.80	2.94
12.	Working in a team with different people.	4.00	2.78
13.	Doing follow-up projects.	4.70	2.63
14.	Thinking our small part would not make a difference.	4.80	2.78
15.	Selecting the best project.	5.00	2.62
16.	Lack of recognition, media coverage.	5.50	2.51
17.	Helping others without embarrassing them or hurting their feelings.	5.67	2.92
18.	Not knowing what to do.	5.70	2.67
19.	Getting too emotionally involved with the agency or individual being helped.	5.80	3.01
20.	That service-learning takes too long and/or is too difficult.	6.10	2.88
21.	Peer pressure.	6.11	2.57

Note. Likert scale: 1 – 2.49 = Important; 2.5 – 4.99 = Slightly Important; 5 – 5.99 = Uncertain; 6 – 7.49 = Slightly Unimportant; ≥ 7.5 = Unimportant.
[a] Consensus of Group.

The field of service-learning lacks research on challenges of service-learning, particularly as it relates to community-based efforts. This study added to the body of research knowledge by discovering different challenges. Many of the challenges identified in this study–particularly those related to planning time, coordination with the community, lack of leverage on the part of the youth, time, and funding–are congruent with those revealed in studies by Shumer (1997), Wade (1997), and Ogden (2002). However, this study discovered several diverse challenges of community-based service-learning as it relates to 4-H Youth Development. These challenges included *finding enough volunteer leaders*, *being able to find other organizations to help*, *working around everyone's schedule*, and *transportation.* One may conclude that these challenges were identified because of the organization through which the service-learning occurred. As a statewide organization, 4-H engages youth in rural, urban, and suburban areas. Many of the study participants lived in rural parts of the state and, thus, had different challenges than would 4-H members and leaders living in more urban areas. In addition, 4-H is a community-based organization that relies heavily on volunteer leaders to facilitate programming with youth during the after-school hours. Although some challenges of service-learning may be similar in both school-based and community-based efforts, participants in a community-based organization such as 4-H may place more importance on certain challenges than do school-based participants.

Recommendations

Based on the results of this study, recommendations can be made for the statewide 4-H Youth Development program in Tennessee. As 4-H Youth Development sustains and expands the existing service-learning initiative, efforts should be made to plan for challenges that could hinder the effectiveness of service-learning projects. State 4-H Youth Development staff should provide training, resources, and technical assistance for regional and county Extension staff, volunteers, and 4-H youth who are facing challenges such as coordinating schedules, recruiting volunteers, keeping up participants' motivation and dedication, funding projects, and filling out paperwork for the projects. Resources should include printed and Web-based manuals for planning effective service-learning projects. Resources should also include a compilation of "best practices" from 4-H groups that have overcome service-learning challenges. In addition, the state 4-H staff should provide 4-H groups with information on available service-learning grants from external sources and also seek funding to continue the 4-H Seeds of Service mini-grants. These grants should enhance the service-learning efforts at the local and regional level and require the minimal amount of paperwork.

Questions for Further Study

Several questions have surfaced as a result of this study. Researchers should examine the effect that certain factors may have on the challenges of service-learning:

1. What impact does location (i.e., rural, urban, limited resource) have on the challenges of service-learning?
2. How does the availability of grant funding, including grant requirements, affect the challenges of service-learning?
3. To what extent does the degree of youth leadership in a project affect the challenges of service-learning?

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THE IMPACT OF SOCIOECONOMIC STATUS ON LEADERSHIP POTENTIAL IN AN AGRICULTURAL LEADERSHIP PROGRAM

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Abstract

Rural leadership programs are designed to teach citizens how to become leaders for the purpose of community improvement. Research has shown that socioeconomic status has a significant impact on an individual's level of participation. Using factor analysis the study tested the impact of socioeconomic status on the leadership and participation of agricultural leadership program graduates at a major land-grant university in the Midwest. Levels of education and income were still significantly related to community commitment. Program directors need to address the effects of tuition and travel expenses to recruit participants from various socioeconomic groups.

Introduction

Agricultural leadership programs have a 70-year history in the United States (Heasley, 1986). There is a need for leadership programs that teach citizens how to cope with a barrage of change in the rural environment (Flora, Flora, & Fey, 2004). Citizens must be educated and prepared with essential knowledge, skills, and abilities in order to engage in leadership positions that concentrate on the many obstacles faced by rural America (Winter, Sloggett, Doekson, & Sanders, 1989).

The current array of agricultural leadership programs demonstrates a significant societal investment towards the important goal of fostering community and public affairs participation of rural citizens (Rossing & Heasley, 1987). Rural community development (RCD) is especially critical in the Midwest where the region is faced with a variety of problems symptomatic of a declining economy and a lack of leadership capacity due to outmigration. Effective RCD depends on the knowledge, skills, and willingness of local leaders to assume key roles in the development process (Mulkey, 1989).

To train more citizens to assume leadership positions, a major land-grant university in the Midwest founded an agricultural leadership program in 1982. The target audience was adults (ages 25-45) involved in agriculture production or agribusiness. The program was designed to provide the training and experience necessary for participants to assume leadership roles within the community and state. Ten classes of approximately 30 participants per class had completed the program at the time of this study. The program objectives included 1) increasing participants' awareness of the agricultural industry, 2) expanding participants' understanding of U.S. economic, political, cultural, and social systems, 3) increasing participants' ability to analyze and react to complex problems affecting rural communities, 5) increasing participants' leadership involvement, and 6) helping participants increase and use their knowledge and skills to solve community problems. Each participant contributed a $1,500.00 fee plus travel expenses. This fee only covered 15% of the actual expenses of the program. A partial fee waiver was only available to full-time agriculture producers who participated in the program.

The program for the most recent cohort consisted of 13 seminars, including a seven-day trip to Washington, D.C., and a two-week trip to New Zealand. The weekend seminars (Friday afternoon to Sunday evening) focused on personal development issues, tours of agricultural research facilities, tours of specialty agricultural enterprises, tours of the state capital and discussions with state leaders, visits with agricultural association leaders, visits with media personalities, and visits to farm shows. Participants also learned about future trends in rural America, including economic and demographic trends in the state.

Theoretical Framework

Rural community development literature emphasizes the importance of citizen participation as a means of strengthening communities (Flora, Flora, & Fey, 2004; Martin & Wilkinson, 1985). A central objective of the agricultural leadership program was to increase the involvement of participants at the local, state, and national levels. Advocates and practitioners of RCD also believe that citizens should be meaningfully involved in community decision-making (Coe, 1990). RCD programs have four basic components: public policy, economic development, community service, and of necessity, leadership (Seevers, Graham, Gamon, & Conklin, 1997). Thus, leadership development is a complex process focusing on changes in knowledge, skills, and abilities of participants.

The current trend of conditions in rural communities suggests that development of local leaders is an essential part of community survival (Kirk & Shutte, 2004; Robinson, 1994). Kirk and Shutte's (2004, p. 234) framework for leadership development include "leading change through dialogue, collective empowerment, and connective leadership". Leadership development programs that ensure an adequate supply of effective leaders are an important aspect of RCD.

Leaders provide the basis for improving the quality of life in communities (Fear, Vandenburg, Thullen, & Williams, 1985). Because effective local leadership does not exist in many rural communities, RCD efforts should include identifying and training potential leaders from diverse backgrounds (Winter, Sloggett, Doekson, & Sanders, 1989). Leadership training may be incorporated as in integral part of RCD programs, or alternately, a leadership training program may serve as the vehicle to allow the identification of community problems, an assessment of alternative approaches to solving problems, and the design of action programs to address community problems.

Socioeconomic status is an indicator derived from income, level of education, and occupation (Link & Phelan, 1995). As residents with lower socioeconomic status tend to participate less in public affairs activities than those with higher socioeconomic status, RCD efforts need to address this participation gap (Martin & Wilkinson, 1985). In some cases, the socioeconomic status of people often limits their access to the decision-making process, excluding them from community affairs. As public policy issues are debated, it is important to remain sensitive to the fact that not all voices are being heard. Leaders must make every effort to recruit and involve people of both racial and ethnic diversity and with lower socioeconomic status as their interests and concerns should not be ignored (Beaulieu & Smith, 2000). By striving to involve new people in the leadership structure of a community, one may introduce new ideas and reach a broader segment of the community (Williams, 1989).

Martin and Wilkinson (1985) stated that leadership programs could effectively close the participation gap between individuals of higher and lower socioeconomic status. Leadership development can enhance the ability of all individuals to participate by developing skills for RCD. Closing the participation gap, therefore, would be a means of promoting RCD by consciously attempting to broaden leadership skills and participation among groups not usually involved in community leadership roles.

The need for effective leadership at the local level has never been greater. Actions at the state and federal levels of government have shifted the responsibility for many programs and services to the local level. As a result local leaders are making more decisions with significant political, social, and economic impacts (Rinehart & Smith, 1995). Those interested in leadership programs aimed at RCD processes should understand the role that socioeconomic status plays in asking citizens to get involved improving the quality of life within communities.

Purpose and Objectives

The purpose of the study was to test the assumption that participants of an agricultural leadership program with higher socioeconomic status tend to participate at higher levels in RCD processes than those with lower socioeconomic status. Specific objectives included 1) describing participants demographically, 2) identifying factors associated with rural community development processes, and 3) determining the relationship between socioeconomic status and participation in RCD processes.

Methods

The population for the study was all graduates of the program (Class I to Class X, 1982 to 2001) (*N*=290). A census was used based on the database kept by the program director. Three individuals were excluded from the study due to death (*n*=1) or incorrect address (*n*=2). The response rate was 43% (*n*=125).

An original survey instrument was developed modeled after Pigg's (2001) *EXCEL: Experience in Community Enterprise and Leadership*. The questions from the survey were grounded in the literature on community development, leadership theory and development, and past evaluation studies of leadership programs. The instrument was a then-post design with Likert-type scales. The ratings included strongly agree, agree, disagree, and strongly disagree and were scored 1-4, respectively. Not sure/not applicable was coded 0 and excluded from the analysis. The Cronbach coefficient alpha for internal consistency for the instrument was calculated at 0.96.

The then-post design was chosen to control for several threats to validity and reliability, including *overestimation of changes in knowledge* and *response-shift bias* among participants. When pretest-posttest information has been collected, actual changes in knowledge and behaviors may be altered if the participants overestimate their knowledge and skills on the pretest. Similarly, pretest overestimation is likely if participants lack a clear understanding of the attitude, behavior, or skill the program is attempting to affect (Pratt, McGuigan, & Katsev, 2000).

Changes in participants' frame of reference due to program training is called *response-shift bias* (Rohs, 1999). To avoid this source of contamination for self-report surveys, a then-post method was used to collect retrospective data at the conclusion of the program as participants rated themselves with a single frame of reference and at a single point in time.

A panel of experts consisting of four faculty members with expertise in leadership education or RCD processes confirmed content and face validity of the survey. A pilot test was conducted with 30 randomly selected participants. The Dillman (2000) four-phase mailing approach was used for both the pilot survey and the final survey, which resulted in a 43% response rate. The surveys were qualitatively analyzed after the pilot test and minor revisions were made. Because only minor revisions were required, the pilot data were pooled with the final survey data, yielding a 57% total response rate.

Double-dipping was used to determine differences between the respondents and non-respondents (Lindner, Murphy, & Briers, 2001). Along with an early-to-late respondent comparison, a random sample of 10% (n=20) of the non-respondents was administered portions of the survey via telephone. The two groups were compared on gender, employment status, level of educational attainment, and marital status with a Pearson Chi-Square. There were significant differences between non-respondents and respondents in gender, employment status, and marital status. There were no significant differences between the early-to-late respondents on any variable. Therefore, generalizing the results of this study must be made with caution.

Survey data were analyzed using SPSS® v. 8.0. An alpha level of .05 was set *a priori* to determine statistical differences among variables. The statistical tests used were descriptive, t-tests, Cohen's d effect size, and ANOVA. Likert-type data is ordinal in nature; thus, it is acceptable and practical to treat it as interval data and subject it to statistical analyses as long as care has been taken in the interpretation of the results (Kerlinger, 1986). Inferential statistics were used as a guide to understanding the relationships between variables.

A factor analysis on Likert-type survey items was used as a data reduction tool and to study the correlations among interrelated variables. The analysis involved varimax rotation and Kaiser normalization, which helped determine the factors impacting community development. With the varimax rotation, the factors were orthogonal (uncorrelated) and independent from one another even if some variables loaded on more than one factor (Kim & Mueller, 1982). Factor scores were then compared with the independent variables of the participants' gender and martial status using an independent t-test to determine significance. A Levene's test determined equality of variances, a prerequisite to the parametric tests. The independent variables of education level and income were compared with the factors in an ANOVA with a Tukey's post hoc test. To the “extent that a test measures a factor, it is said to be loaded on the factor” (Kerlinger, 1973, p. 661). With a sample size greater than 100, loadings of at least 0.40 were considered important and were used to determine which variables were included in a factor (Hair et al., 1998). This factor analysis has required a combination of complex statistical computation and a thoughtful study of the factor structure. Statistics determines which survey items cluster together, but only an observer can determine what each factor may be assessing. In some ways factor analysis is both science and art form.

Findings and Conclusions

One-hundred and thirteen men (90%) and 12 women (10%), all graduates of the agricultural leadership program, responded to the survey. The mean age was 43 years, they had lived in their communities for an average of 24 years, and the average community size was 30,000 people. Respondents were married (90%), well-educated, middle-class working adults who were civically engaged. The majority (54%) graduated from college and 32% had earned graduate credit. Twenty-three percent earned $30-$50,000/year, 54% earned $51-$100,000/year, and 27% earned more than $100,000/year. One-hundred percent of the respondents voted in the last presidential election, while over 93% voted in the last state and local elections. Sixty percent volunteered 5 to 10 hours per month in social service activities. The remaining 40% volunteered between 10 and 20 hours per week. Sixty-nine percent were involved in 5 to 10 hours of economic development activities per month. The remaining 31% gave over 10 hours per week to economic development activities.

The factor analysis produced five conceptual factors that indicate the relationship among the variables.

- Factor 1: Community commitment and future directions
- Factor 2: Expanding participation and community improvement
- Factor 3: Civic engagement
- Factor 4: Community knowledge and personal development
- Factor 5: Community dedication

The factor scores were compared with the independent variables of the participants' gender and marital status using an independent t-test to determine significance. A Levene's test for equality of variances showed equality for all factors for gender.

The factor scores were compared, with the independent variables of the participants' level of education and income using an ANOVA with a Tukey's post hoc test. Factor 1, *community commitment and future directions*, differed with college graduates having a higher factor 1 score than those with only some college ($p < 0.005$).

Factor four, *community knowledge and personal development*, differed for males and females with females being significantly more positive on this dimension ($p < 0.032$). This finding supported Giebink's (1975) finding that women indicated an increase in personal development after participating in a leadership program. Gittell, Ortega-Bustamante, and Steffy (2000) also found that women leaders use the discourse of personal development for community development work and that women in community development organizations assessed community needs more than men did.

When income levels were compared a significant difference was found in factor 5, *community dedication*. In general, the higher the income category, the higher the factor 5 score. Put simply, the higher the income the higher the *community dedication*.

Based upon the response to the survey it is concluded that participants' socioeconomic status (levels of education and income) did impact their participation in rural community development processes in regard to factors 1 and 5. Citizens with higher levels of education tended to participate more in *community commitment and future directions* issues than those with lower socioeconomic status even after participation in the agricultural education leadership program. Those with higher incomes reported higher scores for *community dedication* than those with less income in each of the 4 income categories. Women scored more positively in *community knowledge and personal development* than men.

Discussion and Recommendations

As women in this study were found to be more inclined than men to engage in community knowledge and personal development issues, the program directors should encourage more women to participate in the program. Also, the content of the program should be modified to allow for training in the issues and concerns that women face as rural community leaders. Kirk and Shutte's (2004) framework for community leadership development embraces dialogue and collective empowerment, both feminine strengths, and could serve as a model for enhancing the agricultural leadership program under current study. Since the program is partially self-funded, tuition necessarily excludes certain socioeconomic status groups.

The finding that participants with higher educational and income levels were more committed to the future direction of their communities than those with less education and income confirms previous findings (Link & Phelan, 1995). However, recruiting only those individuals at the higher echelons of society promotes elitism and maintains the current parochial system in rural America. To encourage democracy within the program, the program director should engage individuals from a range of socioeconomic status levels, thus, disseminating RCD process throughout the community. This recommendation is supported by Mulkey's (1989) observation that by consciously attempting to broaden the leadership skills and participation among groups not usually involved in community leadership roles, leadership training programs can increasingly overcome the participation gap between individuals of higher and lower socioeconomic status. When leadership trainees are representative of the community in terms of race, gender, and socioeconomic status, interactions within the group can begin the process of fostering mutual understanding to bridge community groups.

Recommendations for future research include further testing for intervening variables between income and community dedication and for developing strategies to increase participation among lower socioeconomic status groups in agricultural leadership programs, especially those who receive partial fee waivers.

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SELECTED TEXAS AGRICULTURAL ORGANIZATION BOARD MEMBERS' PERCEPTIONS OF COMMUNICATION METHODS AND THE 2002 FARM BILL

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Abstract

The purpose of this study was to identify organizational communication methods and their possible relationship to Texas commodity-specific, general agricultural, and natural resource organization board members' perceptions of FSRI Act of 2002. The seventy participants, from the accessible population (N = 160), were predominantly board members from commodity-specific organizations, ranging in age from 46 to 55 years. The majority of respondents were raised and currently lived on a rural farm or ranch. Respondents had attended college or completed an undergraduate degree.

Selected Texas organizations' board members strongly agreed that their respective organizations wanted to meet their primary objectives regarding the FSRI Act of 2002 and that information about important events or situations were shared within their organizations. Those same respondents strongly agreed that their respective organizations influenced the outcome of the 2002 Farm Bill. Perceptions of organizational communication methods and factors influencing the outcome of the 2002 Farm Bill were summated and correlated. Correlational analyses revealed a significant positive (moderate) relationship between perceived organizational communication methods and perceived levels of factors influencing the outcome of the 2002 Farm Bill. Positive perceptions of farm policy can be increased when specific organizational communication methods are used.

Introduction

In the initial stages of farm policy development, congressional committee members provide time to selected organizational board members to communicate the provisions they want in the farm bill. Many of these messages address concerns about provisions that need to be modified, and innovations needed for issues and programs already implemented.

During farm bill development, messages are communicated about the provisions, issues or programs that will be in new farm bill legislation. National organizational board members and congressional leaders disseminate these messages to other national organizational leaders, lobbyists, and state-level organizational board members who later promulgate the provisions, issues, or programs. After the farm bill has been circulated and enacted, state-level organizational board members adhere to the advice from national and congressional leaders and lobbyists. State-level board members may allow this advice to shape their perceptions of farm policy (Catchings & Wingenbach, 2004).

Organizations have been studied to show how effective leaders and members in an organizational setting can communicate messages, much like the provisions in the farm bill (Conrad, 2000). Members and leaders also have been studied to determine how, as an organizational unit, these groups perceive topics such as the farm bill provisions, issues, or programs, which may affect their entire organization. Organizations can add a dimension to their communication by creating an environment that requires people within the organization to communicate due to a shared purpose (Conrad, 1994). People/members will communicate with colleagues/other members at work either because they partial to them or because they have a shared purpose or task to complete.

Bennis and Nanus (1985) believed communication fosters creative processes and effective communication separates managers from leaders. Leaders may provide the spark for effective organizational communication. Organizations can use organizational communication to show how effectively its leaders and members are communicating knowledge using a variety of communication channels or methods (Conrad, 2000). Organizational communication methods help us understand an organization's functions, behaviors, or perceptions present in the leaders and members of that organization. Pace and Faules (1989) stated if an organization wants to improve, it must improve its organizational communication.

Organizational communication improves the process for establishing policies and norms. Leaders' or board members' behavior and decision-making procedures can influence the behaviors of other members in the organization (Franklin, 1975). Franklin (1975) illustrated a model (Figure 1) that suggested the existence of four major social-psychological factors – organizational climate, managerial leadership, peer leadership, and group process—that serve to describe critical group and organizational conditions and practices influencing communication

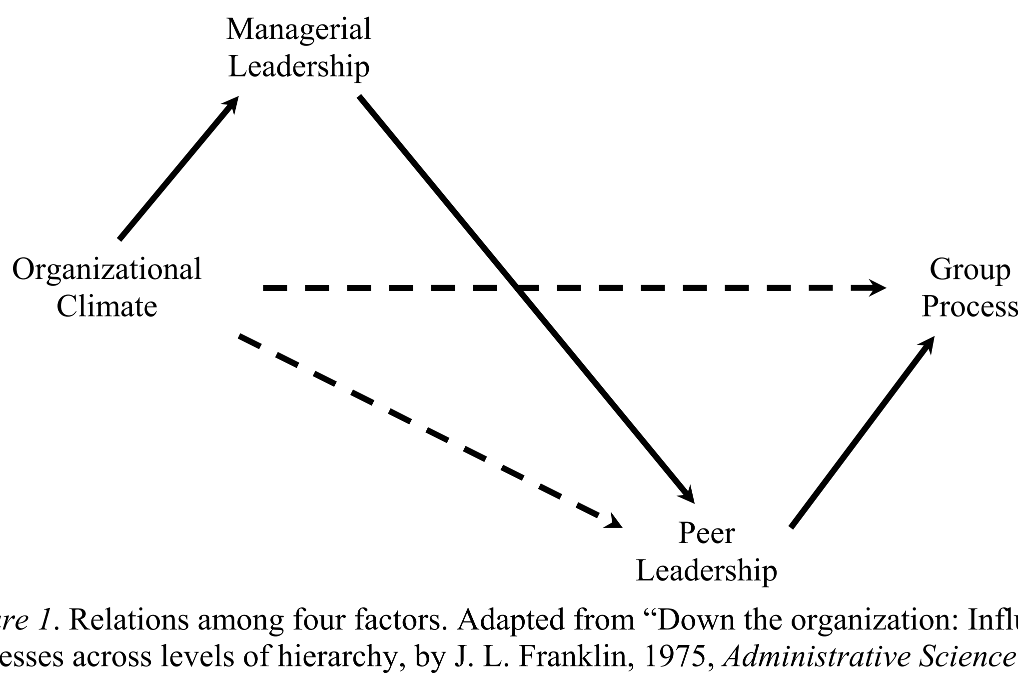

Figure 1. Relations among four factors. Adapted from "Down the organization: Influence processes across levels of hierarchy, by J. L. Franklin, 1975, *Administrative Science Quarterly, 20*, p. 154.

methods (Bowers, 1975 ; Likert, 1961, 1967; Likert & Bowers, 1969, 1973). The model demonstrated that "the major causal pattern for these factors is from organizational climate to managerial leadership to peer leadership, finally resulting in group process” (Franklin, 1975, p. 154). Such a model, organizational climate, managerial leadership, and peer leadership as combined methods, may be useful in determining selected Texas agricultural organization board members’ perceptions of the 2002 Farm Bill.

Based on her study results, Sulak (2000) recommended further research to understand organizations leaders and members’ needs of farm bill policy. Perceptions in this study belong to individuals, but communication processes define how individuals share perceptions to enlighten others (members). Organizational communication methods may influence members’ perceptions. For an organization to realize the effectiveness of communication depends upon the understanding, perceptions, and behaviors of individuals involved within an organization (Wilson, 1964). Scant literature exists to reference how communication relates to perceptions.

Purpose and Objectives

The purpose of this study was to identify organizational communication methods and their possible relationship to Texas commodity-specific, general agricultural, and natural resource organization board members’ perceptions of 2002 Farm Bill. Three objectives guided this study.

1. Determine perceptions of organizational communication methods used by commodity-specific, general agricultural, and natural resources organizations.
2. Determine board members’ perceptions of factors influencing the 2002 Farm Bill outcome.
3. Determine if organizational communication methods were related to board members’ perceptions of factors influencing the outcome of the 2002 Farm Bill.

Methods

The purpose, objectives, and selected methods used to report the results of this study were part of a larger research project entitled, Relationship of Organizational Communication Methods and Leaders’ Perceptions of the 2002 Farm Bill: A Study of Selected Commodity-Specific, General Agricultural, and Natural Resources Organizations (Catchings, 2004).

This study used an ex-post facto, correlational design because the 2002 Farm Bill had been enacted and implemented prior to this study; potential respondents would have established their perceptions of the farm bill prior to data collection. The target population ($N = 300$) included all Texas commodity-specific, general agricultural, and natural resource organization leaders and board members who were deemed to have a stake in the 2002 Farm Bill. The sample was purposefully selected from membership in the Texas Farm Bureau, selected agricultural commodity (cotton, wheat, corn, or grain sorghum) organizations, and the Texas Wildlife Association. The accessible population ($n = 160$), which was considerably less than the target population because of organizations’ confidentially issues, produced 70 respondents for a response rate of 44%.

The conceptual schema for this study was based on research performed by Sulak (2000), which focused on National Commodity board members perceptions of the 1996 Farm Bill and Catchings and Wingenbach (2004) who focused on selected Texas commodity board members’ perceptions of the 2002 Farm Bill. Data were collected from the sample using a modification of Sulak's, Catchings' and Wingenbach's, and Franklin's (1975) surveys. All three surveys used and modified were based on descriptive and causal-comparative designs. Minor editing and word changes were made to the final version of the research instrument used in this study. Researchers employed a cross-sectional and uniform questionnaire, which illustrated similarities and differences of perceptions and communication processes between commodity-specific, general agricultural, and natural resources organizations.

The questions selected for this study used three parts of the research instrument. Part one contained Likert-type (1 = Strongly Disagree …4 = Strongly Agree, or 0 = No Opinion) questions to measure respondents agreement levels with 10 statements regarding factors influencing the outcome of the 2002 Farm Bill. An example of these factors included "Farm organizations strongly influenced the 2002 Farm Bill," and "Non-farm organizations influenced the 2002 Farm Bill more than farm organizations." Cronbach's coefficient alpha for the scale measuring perceptions of factors influencing the outcome of the 2002 Farm Bill was .58.

Part two contained 17 organizational communication questions, which allowed the participants to answer questions about their organization as a whole. Questions ranged from organizational climate, managerial leadership, and peer leadership, to decision-making practices, human resource primacy, motivational conditions, and communication. Responses were recorded using a Likert-type scale (1 = Strongly Disagree…4 = Strongly Agree, 0 = No Opinion). Questions like "My organization wants to meet its primary objective" and "Information is widely shared in my organization" are questions out of the peer leadership items and the index of peer interaction facilitation. Cronbach's coefficient alpha for the scale measuring perceptions of organizational communication methods was .93.

The final section collected demographic information, including age, education, residence, family ownership of farm or ranch, and organization affiliation. This section was used to identify different commodity-specific, general agricultural, and nature resources organization leaders. Reliability and content validity were established by Sulak (2000), Catchings and Wingenbach (2004), and Franklin (1975).

A pilot test with Texas Farm Bureau Association participants, who were not part of sample, was administered in February 2004. The survey length was changed and one question was modified. A *t*-test determined significant differences between pilot test and sample group respondents. Two questions were dropped from further analyses because they did not coincide with the study objectives. This information can only be generalized to the accessible population because of a lower than expected response rate (44%).

A customized mixed-mode method was used to collect information from selected respondents by e-mail first, followed by paper surveys (Schaefer & Dillman, 1998). Organization leaders or directors were given instructions to distribute, and collect the paper-formatted surveys, or distribute the Internet address of the online survey to their members. Correct follow-up procedures were used for this study. Phone calls and e-mail messages were sent to organization leaders who had not responded. Online survey data were coded and kept in a password-secured database. This research study was reviewed, and approval was granted (IRB #2004-0028) on February 9, 2004.

Results

Respondents were mostly board members from commodity-specific organizations (57%) and were 46 to 55 years old (40%). They had attended college or had completed an undergraduate degree (56%), were raised on a rural farm or ranch (67%), and currently lived on rural farm or ranch (60%) (Table 1).

Table 1
Demographic Frequencies of Respondents (N = 70)

Variables		f^a	%
Organization:	Commodity-specific	40	57
	General Agriculture	21	30
	Conservation or Natural Resources	7	10
Age:	46-55	28	40
	36-45	13	19
	26-35	10	14
	>56	17	24
	<25	1	1
Education:	Undergraduate degree	39	56
	Attended college	15	21
	High School diploma	9	13
	Masters degree	5	7
	Doctoral Degree	1	1
Location where raised:	Rural farm/ranch	47	67
	Rural community (Less than 5,000)	13	19
	Small city (50,001 to 200,000)	3	4
	Metropolis (Over 1 million)	3	4
	Town (5,000 to 50,000)	2	3
	City (200,001 to 1 million)	1	1
Currently Live:	Rural farm/ranch	42	60
	Rural community (Less than 5,000)	12	17
	Town (5,000 to 50,000)	4	6
	Small city (50,001 to 200,000)	4	6
	City (200,001 to 1 million)	4	6
	Metropolis (Over 1 million)	3	4

[a]Frequencies may not total 70 because of missing data.

To complete the first objective, selected Texas agricultural organization respondents (*n* = 70) rated their levels of agreement to certain organizational communication methods. A Likert-type scale (1 = Strongly Disagree … 4 = Strongly Agree, or 0 = No Opinion) was used to measure board members' perceptions of their organizational communication methods; agreement levels ranged from 3.02 to 3.61 for each item (Table 2).

Table 2
Descriptive Statistics for Selected Texas Organization Respondents' Perceptions of Organizational Communication Methods Used in Their Organizations (N = 70)

	CS (n = 40)		GA (n = 21)		C/NR (n = 7)		Total (N = 70)	
Organizational Communication Methods	M^a	*SD*	M^a	*SD*	M^a	*SD*	M^a	*SD*
My organization wants to meet its primary objectives.	3.63	.49	3.60	.50	3.50	.55	3.61	.49
Information about important events or situations is shared within my organization.	3.49	.60	3.65	.59	3.17	.41	3.51	.59
I encourage members to exchange opinions and ideas.	3.47	.56	3.55	.61	3.20	.45	3.48	.56
Information is shared in my organization.	3.53	.51	3.37	.83	3.00	.89	3.43	.67
Organizational objectives are announced with no opportunity to raise questions or give comments.	3.43	.73	3.35	.75	3.40	.55	3.40	.71
Decision makers have access to all available information in my organization.	3.47	.51	3.30	.66	3.17	.41	3.39	.55
My informational needs, as a director, are adequately met within my organization.	3.54	.51	3.20	.52	3.00	.71	3.39	.55
My organization makes decisions and solves problems well.	3.43	.50	3.26	.45	3.50	.55	3.39	.49
Organizational members have knowledge that is communicated to decision makers.	3.42	.50	3.30	.57	3.20	.45	3.37	.52
My organization plans and coordinates its efforts collaboratively.	3.49	.51	3.15	.49	3.33	.52	3.37	.52
Organizational objectives are announced and explained with opportunities to ask questions.	3.34	.75	3.25	.79	3.00	.71	3.29	.75
Organizational members are receptive to my ideas and suggestions.	3.35	.54	3.16	.50	3.25	.50	3.28	.52
Members in my organization listen to me.	3.26	.55	3.32	.48	3.25	.50	3.28	.52
Decisions are made at levels with the most adequate and accurate information available.	3.26	.55	3.25	.55	3.20	.45	3.25	.54
Organizational objectives are created and are discussed, and sometimes modified by members before being issued throughout the entire organization.	3.24	.60	3.30	.66	2.83	.41	3.22	.61
Specific alternative objectives are crafted by leaders, then members are asked to discuss them, indicating the objective they think is best for the organization.	3.32	.53	2.70	.92	2.83	.41	3.08	.73
After decisions are made, people affected by those decisions are asked for their ideas.	3.11	.79	2.90	.91	2.75	.96	3.02	.83

Note. Key: CS = Commodity-specific; GA = General Agriculture; C/NR = Conservation/Natural Resources. [a]Likert-type scale: (1 = Strongly Disagree …4 = Strongly Agree, or 0 = No Opinion).

Respondents strongly agreed (M = 3.61) that their organizations wanted to meet their primary objectives regarding the 2002 Farm Bill. They strongly agreed (M = 3.51) that information about important events or situations were shared within their organizations. Overall, respondents agreed with 16 organizational communication methods. There was no disagreement with any of the organizational communication methods (Table 2).

To complete the second objective, members of all selected Texas agricultural organizations were asked to rate their level of agreement with 10 statements measuring factors that may have influenced the outcome of the 2002 Farm Bill. A Likert-type scale (1 = Strongly Disagree …4 = Strongly Agree, or 0 = No Opinion) was used to measure board members' perceptions of factors influencing the outcome of the 2002 Farm Bill. Agreement levels of factors influencing the outcome of the 2002 Farm Bill ranged from 2.51 to 3.74 for each item (Table 3).

Table 3

Descriptive Statistics for Selected Texas Organization Respondents' Perceptions of Factors Influencing the Outcome of the 2002 Farm Bill (N = 70)

	CS (n = 40)		GA (n = 21)		C/NR (n = 7)		Total (N = 70)	
Statements	M^a	*SD*	M^a	*SD*	M^a	*SD*	M^a	*SD*
Farm organization coalitions were essential for enacting the 2002 Farm Bill	3.93	.27	3.45	.76	3.40	.55	3.74	.54
Farm organizations strongly influenced the 2002 Farm Bill	3.88	.34	3.57	.60	3.00	.71	3.71	.52
Farm organizations influenced the 2002 Farm Bill more than non-farm organizations	3.63	.59	3.48	.75	3.20	.45	3.55	.64
My organizations strongly influenced the 2002 Farm Bill	3.62	.54	3.45	.51	2.75	.50	3.51	.56
The 2002 Farm Bill impacts conservation programs more than previous farm bills	3.03	.66	3.05	.62	3.20	.45	3.05	.63
Non-farm organizations influenced the 2002 Farm Bill more than farm organizations	2.95	.70	3.19	.75	3.00	.00	3.03	.70
The 2002 Farm Bill impacts natural resources issues more than previous farm bills	2.97	.63	2.86	.73	3.25	.50	2.95	.65
Interests of the environmentalists were opposites of farmers for the 2002 Farm Bill	2.82	.69	2.95	.78	2.40	.89	2.82	.74
Non-farm organizations strongly influenced the 2002 Farm Bill	2.66	.75	2.45	.89	2.75	.50	2.60	.78
The 2002 Farm Bill impacts farm production more than previous farm bills	2.36	.72	2.62	.74	3.25	.50	2.51	.74

Note. Key: CS = Commodity-specific; GA = General Agriculture; C/NR = Conservation/Natural Resources. [a]Likert-type scale: (1 = Strongly Disagree …4 = Strongly Agree, or 0 = No Opinion).

Respondents strongly agreed, "Farm organization coalitions were essential for enacting the 2002 Farm Bill" (M = 3.74), and "Farm organizations strongly influenced the 2002 Farm Bill" (M = 3.71). Respondents also strongly agreed with the statements, "Farm organizations influenced the 2002 Farm Bill more than non-farm organizations" (M = 3.55), and "their respective organizations strongly influenced the 2002 Farm Bill" (M = 3.51). As a group, they agreed, "The 2002 Farm Bill impacts farm production more than previous farm bills" (M = 2.51). There was no disagreement with any of the factors influencing the outcome of the 2002 Farm Bill (Table 3).

To accomplish the third objective, respondents' perceptions of organizational communication methods and the influencing factors affecting the outcome of the 2002 Farm Bill were summated and correlated to determine if a significant relationship existed (Table 4). The relationships between variables with continuous scores were analyzed using Pearson's Product-moment correlations (Borg & Gall, 1989). A significant positive (moderate) relationship (r = .33) existed between respondents' perceived organizational communication methods and perceived levels of factors influencing the outcome of the 2002 Farm Bill.

Table 4
Significant Correlations among Selected Variables (N = 70)

Variables	1[a]	2[b]
1. Perceptions of factors influencing the outcome of the 2002 Farm Bill	—	.33**
2. Perceptions of organizational communication methods used by selected Texas agricultural organizations		—

Note. Four-point scales (1 = Strongly Disagree …4 = Strongly Agree, or 0 = No Opinion) were summated to determine respondents' overall perceptions of factors influencing the outcome of the 2002 Farm Bill and perceptions of organizational communication methods.
[a]Perceptions of factors influencing the farm bill ranged from 5-37 (*M* = 29.85, *SD* =5.48). [b]Perceptions of organizational communication methods ranged from 38-146 (*M* = 58.82, *SD* = 13.00).
**$p < .01$.

Conclusions, Recommendations, and Implications

Respondents want their respective organizations to meet their primary objectives and to receive information about events or situations shared within those organizations. These organizational communication methods coincide with Franklin's (1975) peer leadership factor. An implication exists that there are ways for organizations to set objectives; organizations can add a dimension to their communication by creating an environment that requires people within the organization to communicate due to a shared purpose (Conrad, 1994). Shared purposes are comparative to objectives set by organizational board members.

Successful organizations result when members of the organization, including leaders, share the same vision (purpose) or agenda (Bennis & Nanus, 1985). It is recommended that more research involving Texas farm, non-farm, and other organizations is needed to gather perceptions of and use of organizational communication methods. As indicated in this research, the respondents strongly agreed their respective organizations wanted to meet their primary objectives; with more research, organizations and the public can determine what these objectives are and compare them to other organizations. Researchers also need to develop an understanding of how organizations can resolve political predicaments (Bennis & Nanus) with the use of communication methods (Conrad, 1994) and perceptions (Mark, Daniel, & Parcell, 2002; Catchings & Wingenbach, 2004).

Commodity-specific respondents' strong agreement levels were congruent with the overall organizational factors influencing the outcome of the 2002 Farm Bill. Overall, this study showed that respondents strongly agreed their respective organizations (farm organizations) influenced the outcome of the 2002 Farm Bill, which mirrors the findings in Catchings' and Wingenbach's (2004) study. Catchings and Wingenbach indicated there was a shift between national (Sulak, 2000) and state-level commodity board members' (Catchings & Wingenbach) perceptions of these organizational influencers. Respondents in this study were analogous to respondents from a previous study (Catchings and Wingenbach, 2004) in terms of their perceptions of factors influencing the outcome of the 2002 Farm Bill.

The shift between national commodity organizational board members, state-level commodity board members, and other selected Texas organizations could be related to the multitude of House Committee on Agriculture hearings that allowed commodity groups to present specific recommendations for the new farm bill (Mark, Daniel, & Parcell, 2002; Catchings & Wingenbach) study. This study illustrated such inferences could be the result of a heterogeneous, rather than homogeneous (Catchings & Wingenbach) respondent group's collective perception of their organizations' input in forming the 2002 Farm Bill. The findings concur with Mark, Daniel and Parcell in that the needs and perceptions of both groups (farm and non-farm) would be useful to policy makers in the development of future farm bills.

More research is needed to show if non-farm organizations have the same influence as farm organizations on agricultural policy at the national level. This study showed farm organizations viewed themselves as affecting the outcome of the 2002 Farm Bill, but respondents from non-farm organizations such as conservation or natural resource organizations, also viewed farm organizations as having affected the outcome of the 2002 Farm Bill. An implication, concurrent with previous studies (Catchings & Wingenbach, 2004; Mark, Daniel & Parcell, 2002), is that more research is needed to gather organizational board members input. This input will be beneficial to policy makers as new farm bills are developed, written, passed, and executed.

There was a significant positive (moderate) relationship (r = .33) between perceived organizational communication methods and perceived levels of factors influencing the outcome of the 2002 Farm Bill. An implication exists that as perceptions of organizational communication methods ratings are increased, then perceptions of organizational factors influencing the outcome of the 2002 Farm Bill increase. Alternatively, if perceptions of organizational factors influencing the outcome of the 2002 Farm Bill increased, then perceptions of organizational communication methods will increase.

Mark, Daniel, and Parcell's (2002) study found perceptions could change over time. This study did not measure perceptions over time, but it did show that different organizational board members' perceptions could or would change considering their respective affiliations. However, as those perceptions change, positive perceptions of farm policy can be increased when specific organizational communication methods are used. Based on Franklin's (1975) study, that certain organizational communication methods used were itemized and indexed, this study showed that the peer leadership items and peer interaction facilitation index were perceived highly among respondents. These perceptions are useful for increasing our understanding of the phenomena under study.

Even the small population present in this study helps us understand "information regarding farm policy can be useful to policy makers evaluating differences in policy impacts for farming operations of various sizes or geographic locations" (Mark, Daniel, & Parcell, 2002). The implication in this finding is that organizational board members need to identify those influencers and organizational communication methods that could strongly influence the framing of future farm policies. More research is recommended to identify which organizational communication methods increase perceptions of organizational influencers and vice versa. Researchers should conduct studies within organizations, not just as outsiders, but also as members of a respective organization. Such research could assess different variables correlating to organizational influence on farm policy and organizational communication methods that are being used to determine if they concur or differ with this study.

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BENEFITS OF SERVICE-LEARNING IN TENNESSEE 4-H YOUTH DEVELOPMENT: A DELPHI STUDY

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Abstract

Service-learning is growing in popularity as a methodology for teaching youth life skills and 4-H project knowledge. Through a modified Delphi technique, a panel comprised of Tennessee 4-H'ers, volunteers, and agents identified and prioritized benefits of utilizing service-learning to fulfill the mission of the state's 4-H Youth Development program. The study found that primary benefits of conducting service-learning projects through 4-H Youth Development are getting kids involved in community service; teaching youth dependability, responsibility, and commitment; and developing citizenship skills/civic responsibility. There were some differences among the subpanels' lists and prioritization of the benefits. The study has implications for 4-H leaders, both youth and adult, who employ service-learning as a teaching tool.

Introduction/Theoretical Framework

Since its inception in 1902, the 4-H Youth Development program has outlined community service as one of its primary objectives. In October 2000, Tennessee 4-H Youth Development expanded that service commitment to include service-learning, a form of experiential education where youth apply knowledge, skills, critical thinking, and wise judgment to address genuine community needs (Toole & Toole, 1994). Service-learning is a growing methodology for fulfilling the 4-H mission of helping youth develop skills and attitudes they need to become successful adults. After receiving a 3-year grant from the Tennessee Commission on National and Community Service and Learn and Serve America, the Extension Service began a statewide initiative to infuse service-learning throughout the 4-H Youth Development program (Mantooth & Hamilton, 2004). The program provided training and resources for youth and adults, as well as opportunities for funding and recognition for projects. From October 2000 until December 2003, more than 182,000 4-H'ers partnered with 14,800 adults to conduct 5,300 service-learning projects, benefiting more than 901,000 people through 585,000 hours of service (Mantooth & Hamilton, 2004).

Nationally, service-learning can trace its theoretical roots to John Dewey, Alexis de Tocqueville, William James, and Thomas Jefferson, as well as historical movements such as the push for civil rights in the 1960s (Waterman, 1997a). Dewey is credited with conceptualizing ideas of experiential education and reflective thinking, both vital components of service-learning. Dewey's work also provided the foundation for key elements of service-learning, such as student involvement in developing learning objectives, working cooperatively on learning tasks, linking what is learned to personal experience, placing importance on social and not just intellectual development, and valuing actions for the welfare of others (Kraft, 1996).

In 1910, American philosopher William James called for a program of national service for youth that would serve as the moral equivalent of war, something that would speak to men's souls as universally as war did and yet be compatible with their spiritual selves (Waterman, 1997a). The Twentieth Century saw many large-scale efforts to engage youth in service, including the Civilian Conservation Corps, the Peace Corps, Volunteers in Service to America, the Youth Conservation Corps, and other organizations that sought to benefit the volunteers who were serving their communities (Corporation for National and Community Service, n.d.; Kraft, 1996; Pritchard, 2002; Waterman, 1997b). Additionally, service-learning gained national attention with the passage of the National and Community Service Trust Acts of 1990 and 1993.

This legislation established the Corporation for National and Community Service (CNCS), a federal agency that provides grants for both school-based and community-based service programs. School-based service-learning is organized as part of the academic curriculum of an elementary or secondary school or an institution of higher education, whereas community-based service-learning is organized through a community agency or youth-serving organization (National and Community Service Trust Act of 1993). While much attention has been given to school-based service-learning, community-based efforts also have grown over the past 10 years. The CNCS has awarded more than $37 million to community-based organizations and state service commissions, and a substantial amount of community-based service-learning is occurring beyond what is funded through the CNCS (Bailis & Lewis, 2003).

The number of youth engaged in service is increasing. Skinner & Chapman (1999) revealed that 64% of all public schools had students involved in service activities recognized and/or arranged through the school, and 32% of all public schools organized service-learning as part of their curriculum. Shumer and Cook (1999) reported that 6.1 million high school students were involved in service-related programs in 1997, and Safrit and Auck (2003) found that 98% of Ohio 4-H'ers had voluntarily helped others within the previous year.

The increasing number of youth involved in service-learning has sparked a growing field of research on the impact of service-learning. Because the youth engaged in service-learning are often outside the classroom, interacting with community members and organizations, impacts of service learning are not limited to youth. Indeed, researchers (Billig, 2000; Blyth, Saito, & Berkas, 1997; Eyler & Giles, 1999; Scales & Leffert, 1999; Melchior, 1999) have found an impact on youth, schools and community organizations through which they work, and communities they serve.

Youth participating in service-learning programs, both school-based and community-based, show increased self-esteem and problem-solving skills, more positive attitudes toward adults, and increased concern for others' welfare (Scales & Leffert, 1999). Service-learning also has a positive impact on students' civic attitudes and participation, particularly if students remain active in organized service activities (Melchior, 1999). Student outcomes are influenced by the level of youth leadership, hours spent in service, quality of service placement, structured reflection opportunities, the intensity of the service experience, program design, and implementation (Blyth, Saito, & Berkas, 1997; Eyler & Giles, 1999).

Communities, schools, and organizations also experience benefits from service-learning programs. Community members have more positive perceptions of schools and youth. Furthermore, schools report greater mutual respect between teachers and students, improvements in the overall school climate, and increased school cohesiveness (Billig, 2000b). Melchior (1999) reported that organizations utilizing service-learning improved services to clients and the community, increased capacity to take on new projects, and formed new relationships with public schools.

Despite the number of community-based organizations that are engaging in service-learning and the increasing amount of research in the field, "community-based service-learning is the least understood and least studied of the streams of service-learning" (Bailis & Lewis, 2003, p. 17). Therefore, understanding the benefits of service-learning in community-based organizations, particularly 4-H Youth Development, is a problem due to the lack of research on community-based service-learning.

Purpose and Objectives

The purpose of this study was to identify benefits of service-learning in Tennessee 4-H Youth Development. Furthermore, the researchers sought to describe perceived differences among three subgroups: 4-H members, volunteers, and Extension agents.

Procedures

Researchers used the modified Delphi technique with a panel of experts to generate data for the study. The Delphi technique is a method of group communication that is effective in allowing a group of experts, as a whole, to deal with a complex problem (Linstone & Turoff, 1975). The technique uses sequential questionnaires developed through summarized information and feedback of opinions from earlier responses (Delbeq, Van de Ven, & Gustafson, 1975).

Panel members (n = 30) were purposefully selected from individuals who served as youth coordinators, adult volunteer coordinators, or Extension contacts for 10 service-learning projects funded by 4-H Seeds of Service mini-grants between April 2001 and October 2003. The panel consisted of 10 4-H members, 10 adult volunteer leaders, and 10 4-H agents. The members represented the four districts of the University of Tennessee Agricultural Extension Service, providing statewide scope to the study. Youth, volunteers, and Extension agents comprised separate subpanels due to the groups' varying developmental level, focus, needs, and experience with service-learning.

The researchers administered a series of three questionnaires to participants. The first questionnaire consisted of an open-ended question—"*The benefits of conducting service-learning projects through 4-H Youth Development are . . .*"—that generated a list of benefits of service-learning implemented through the 4-H Youth Development program. The researchers summarized responses from the first questionnaire and eliminated any duplicate responses. Three, second-round questionnaires, one for each subpanel, were developed from the responses provided in round one. The second-round questionnaires asked participants to rate responses on a Likert-type scale of 1 (most important) to 9 (least important). The third round questionnaires ranked the responses to each question from most important to least important by arithmetic mean. Panel members were provided with the subgroup's mean and their own rating for each item. In addition, they were asked to explain why they disagreed with the rankings, if they did. A panel of experts, consisting of three faculty members and two 4-H Youth Development specialists, determined face and content validity for each instrument. Dalkey (1969) stated that the reliability was greater than .80 when the Delphi group was larger than 13.

First round questionnaires were mailed to participants. Participants had the option of responding through a paper copy or Web-based questionnaire. Subsequent questionnaires were distributed to panel members either through the mail or e-mail, based on respondents' preferred method of receiving correspondence as indicated through the first Web-based questionnaire.

In round one, 18 panel members responded through the on-line questionnaire and 7 mailed or faxed their questionnaires, providing an 83% ($n = 25$) response rate. The 4-H youth subpanel had a 60% ($n = 6$) response rate; the volunteer subpanel had a 90% ($n = 9$) response rate; and the Extension agent subpanel had a 100% ($n = 10$) response rate. Responses from the three subgroups were maintained separately. Data generated by youth panel members were not considered until signed informed consent statements were on file with the researchers.

In the first round, the 4-H youth subpanel ($n = 6$) generated 59 statements, which were summarized to 26 benefits. The volunteer subpanel ($n = 9$) generated 73 statements, which were summarized to 34 benefits. The Extension agent subpanel ($n = 10$) generated 95 statements, which were summarized to 30 benefits.

In round two, 21 panel members responded on-line, and 4 mailed or faxed their surveys, providing an 83% response rate. The 4-H youth subpanel had a 70% ($n = 7$) response rate; the volunteer subpanel had an 80% ($n = 8$) response rate; and the Extension agent subpanel had a 100% ($n = 10$) response rate. As with the first questionnaire, responses from the subgroups were maintained separately.

The researchers calculated the arithmetic mean and standard deviation for each response. Mean scores of the round two questionnaires were used to determine importance of each statement. Responses were categorized as "important" (1 – 2.49), "slightly important" (2.5 – 4.99), "uncertain" (5 – 5.99), "slightly unimportant" (6 – 7.49) or "unimportant" (≥ 7.5). Standard deviation of ≤ 1.5 indicated that consensus was reached within the subpanel. These data were used to develop the third and final round of questionnaires.

Twenty-two panel members responded on-line, and three mailed the surveys, providing an 83% response rate to the third questionnaire. The 4-H youth subpanel had a 70% ($n = 7$) response rate; the volunteer subpanel had an 80% ($n = 8$) response rate; and the Extension agent subpanel had a 100% ($n = 10$) response rate. Responses from the subgroups were maintained separately.

Findings

In this study, a purposefully selected panel of 4-H youth, volunteers, and Extension agents was utilized to generate and prioritize benefits of conducting service-learning projects in Tennessee 4-H Youth Development.

Benefits Identified by 4-H Youth Subpanel

The 4-H youth subpanel rated the importance of 26 benefits of conducting service-learning projects through 4-H Youth Development (Table 1). The mean and standard deviation for each statement are described in Table 1. The statements are prioritized in order of most important to least important by average arithmetic mean scores. The 4-H youth subpanel reached consensus on 13 of the 18 benefits ranked as "important." Some of these benefits include *getting kids involved in community service* (M = 1.00, SD = 0.00)*; helping others, making a difference, meeting community needs* (M = 1.28, SD = 0.49)*; learning organization and responsibility* (M = 1.57, SD = 0.53)*;* and *having fun* (M = 2.14, SD = 0.69).

Table 1
Delphi Study Round Two: Prioritized List of Benefits Identified by 4-H Youth Subpanel (n = 7)

	Benefit	*M*	*SD*
1.	Getting kids involved in community service.	1.00	0.00[a]
2.	Helping others, making a difference, meeting community needs.	1.28	0.49[a]
3.	Giving youth the power to change something about their community.	1.43	0.79[a]
4.	Learning organization and responsibility.	1.57	0.53[a]
5.	Teamwork; collaborating with others.	1.57	0.79[a]
6.	Helping youth develop people skills.	1.57	0.79[a]
7.	Learning leadership skills.	1.57	0.79[a]
8.	Teaching solid values.	1.85	1.57
9.	Giving youth a chance to understand management of a group.	2.00	1.15[a]
10.	Understanding and being a part of your community; building a sense of community.	2.00	1.15[a]
11.	Having fun.	2.14	0.69[a]
12.	Breaking down social barriers to unite and achieve a common goal.	2.14	1.57
13.	Learning from the people you're helping and from other volunteers.	2.14	1.86
14.	Raising awareness of the problems in your community.	2.14	2.19
15.	That it benefits the organization being helped.	2.29	1.89
16.	Personal rewards from helping others (feeling good, sense of worth).	2.43	1.13[a]
17.	Meeting others; making friends.	2.43	1.27[a]
18.	Having enough money to buy equipment needed to perform service projects.	2.43	1.40[a]
19.	Publicity for 4-H (as a service organization, not just for agriculture).	2.71	1.60
20.	Learning to work with other organizations within your community.	3.00	1.63
21.	Using skills and creating a learning environment while having fun and helping others.	3.14	2.79
22.	Working in a youth/adult partnership.	3.57	2.37
23.	Having other opportunities arise.	3.86	1.68
24.	Possible scholarship opportunities.	3.86	1.86
25.	Recognition for service.	5.57	2.76
26.	Getting out of school.	8.14	1.57

Note. Likert scale: 1 – 2.49 = Important; 2.5 – 4.99 = Slightly Important; 5 – 5.99 = Uncertain; 6 – 7.49 = Slightly Unimportant; ≥ 7.5 = Unimportant.
[a] Consensus of Group.

In round three, five 4-H youth subpanel members indicated disagreement with the ranking of eight statements. Panel members responded in favor of higher importance for six benefits, including *getting out of school, learning leadership skills,* and *meeting others and making friends*. Panel members thought the ranking should be less important on the benefits of *breaking down social barriers to unite and achieve a common goal* and *recognition for service*. One benefit, *publicity for 4-H (as a service organization, not just agriculture)*, received one response that it should be more important and two that it should be less important. The panel members' explanations for their responses were based on their personal experiences with service-learning in their counties.

Benefits Identified by Volunteer Subpanel

The volunteer subpanel rated the importance of 34 benefits of conducting service-learning projects through 4-H Youth Development. The mean and standard deviation for each statement are described in Table 2. The statements are prioritized in order of most important to least important by average arithmetic mean scores. The volunteer subpanel reached consensus on 20 of the 21 benefits ranked as "important." Some of these statements include *teaching youth dependability, responsibility, and commitment* (M = 1.00, SD = 0.00); *developing leadership skills* (M = 1.14, SD = 0.38); *helping youth see themselves as valuable and responsible community members* (M = 1.14, SD = 0.38); and *children/teens learning self-esteem by making a difference in the community* (M = 1.28, SD = 0.49).

In round three, four volunteer subpanel members indicated disagreement with the ranking of 12 statements. Panel members responded in favor of higher importance on the following statements: *children/teens learning self-esteem by making a difference in the community, teaching life skills and useful knowledge/experience, teaching youth that you have to work for what you want, developing record keeping and documentation skills, that it's a hands-on learning time,* and *recognition*. Respondents thought these statements should be less important: *keeping children/teens involved, keeping youth busy and out of trouble, seeing how supportive everyone was of the project,* and *youth getting to travel abroad*. Two statements received mixed comments. For the benefit of *learning to use new equipment, such as a sewing machine*, one respondent commented that it should be more important, while another respondent had the opposite view. Similarly, the benefit of *giving youth community service involvement that they can put on college scholarship applications* received opposing comments from two panel members. The reasons given for disagreeing with each of these statements were based on panel members' personal experiences with service-learning.

Benefits Identified by Extension Agent Subpanel

The Extension agent subpanel rated the importance of 30 benefits of conducting service-learning projects through 4-H Youth Development. The mean and standard deviation for each statement are described in Table 3. The statements are prioritized in order of most important to least important by average arithmetic mean scores. The Extension agent subpanel reached consensus on 18 of the 21 benefits ranked as "important." Some of these statements include *developing citizenship skills/civic responsibility* (M = 1.11, SD = 0.33); *teaching youth about helping others and the importance of service* (M = 1.22, SD = 0.44); *developing leadership skills* (M = 1.33, SD = 0.50); and *promoting youth in a positive way* (M = 1.33, SD = 0.50).

Table 2
Delphi Study Round Two: Prioritized List of Benefits Identified by Volunteer Subpanel (n = 8)

	Benefit	*M*	*SD*
1.	Teaching youth dependability, responsibility, and commitment.	1.00	0.00[a]
2.	Developing leadership skills.	1.14	0.38[a]
3.	Helping youth see themselves as valuable and responsible community members.	1.14	0.38[a]
4.	Children/teens learning self-esteem by making a difference in the community.	1.28	0.49[a]
5.	Developing teamwork skills.	1.29	0.49[a]
6.	Teaching life skills and useful knowledge/experience.	1.29	0.49[a]
7.	Helping others; improving the community; meeting community needs.	1.29	0.76[a]
8.	Developing a lifetime habit of service; teaching youth compassion and to give back to the community.	1.43	0.79[a]
9.	Learning to see a specific need and plan a project to help (conceive, plan, and accomplish a mission).	1.43	0.79[a]
10.	Helping youth see what their talents are.	1.50	0.76[a]
11.	Youth becoming more interested in the community and more aware of community needs.	1.57	0.79[a]
12.	Teaching youth that you have to work for what you want.	1.57	1.13[a]
13.	Having fun while learning and meeting a community need.	1.71	0.95[a]
14.	Working in youth/adult partnerships.	1.71	1.11[a]
15.	Keeping children/teens involved with adults, which creates a bond for a lifetime.	1.86	0.90[a]
16.	Developing listening skills (how to follow instructions).	2.00	1.41[a]
17.	Developing record keeping and documentation skills.	2.14	0.90[a]
18.	4-H promotion; community seeing 4-H as a service-oriented organization.	2.29	1.50[a]
19.	Motivating the people in the community.	2.43	0.98[a]
20.	Meeting others; forming bonds with youth and adults.	2.43	1.27[a]
21.	Building relationships/networks in the community.	2.43	1.51
22.	Acquiring a better knowledge of the . . .	2.5	1.31[a]
23.	Learning to use new equipment, such as a sewing machine.	2.5	2.07
24.	Personal/emotional rewards.	2.71	1.50[a]
25.	Having access to expertise of 4-H/University staff where my knowledge is limited/lacking.	2.86	1.07[a]
26.	Having funding for a needed project.	2.86	1.86
27.	Keeping children/teens involved.	2.86	2.41
28.	That it's a hands-on learning time.	2.88	2.10
29.	Giving youth community service involvement that they can put on college scholarship applications.	3.00	2.20
30.	Keeping youth busy and out of trouble.	3.25	2.31
31.	Seeing how supportive everyone was of the project.	3.86	1.07[a]
32.	Recognition.	4.43	2.51

	Benefit	M	SD
33.	Youth getting to travel abroad.	5.38	2.67
34.	That prizes are offered.	6.25	2.05

Note. Likert scale: 1 – 2.49 = Important; 2.5 – 4.99 = Slightly Important; 5 – 5.99 = Uncertain; 6 – 7.49 = Slightly Unimportant; ≥ 7.5 = Unimportant.
[a] Consensus of Group.

In round three, three Extension agent subpanel members indicated disagreement with the ranking of seven statements. Panel members responded in favor of higher importance for the following benefits: *promoting youth in a positive way, teaching youth life skills, developing decision making skills, recognition/community awareness of service activities, good publicity for 4-H, that 4-H has a lot of good resources,* and *securing new funding sources to acquire new educational materials and resources in the county*. The panel did not recommend that any statements be ranked less important.

Conclusions

The three subpanels generated many statements with similar content. These benefits included *getting kids involved in community service and developing a habit of service*, *helping others and meeting community needs*, *learning/teaching responsibility, developing leadership skills,* and *teamwork and networking in the community*. The three subpanels generated several statements related to youth becoming more aware of community problems, developing civic responsibility, and feeling connected to the community. The three subpanels also generated several statements related to teaching skills such as record keeping, communication, and people skills.

Although the subpanels generated many of the same benefits of service-learning in 4-H, there were differences among the subpanels' lists and prioritization of benefits. For instance, the 4-H youth and volunteer subpanels agreed on the benefit of *having fun.* And the volunteer and Extension agent subpanels had similar views on the benefits of *developing and working in youth-adult partnerships* and *publicity for 4-H as a service organization*.

The 4-H youth subpanel generated one benefit—*getting out of school*—that the other subpanels did not. The volunteer subpanel had six statements that were unique from the benefits generated by the other subpanels. These included *keeping youth busy and out of trouble, youth getting to travel abroad,* and *keeping children/teens involved.* The Extension agent subpanel had two statements that were not also generated by the other subpanels. These benefits were *that 4-H has a lot of good resources* and *that a little money given here can make a big difference in other countries*.

Table 3
Delphi Study Round Two: Prioritized List of Benefits Identified by Extension Agent Subpanel (n = 9)

Benefit		M	SD
1.	Developing citizenship skills/civic responsibility.	1.11	0.33[a]
2.	Teaching youth about helping others and the importance of service.	1.22	0.44[a]
3.	Developing leadership skills.	1.33	0.50[a]
4.	Promoting youth in a positive way.	1.33	0.50[a]
5.	Helping others.	1.33	0.71[a]
6.	Teaching youth life skills.	1.33	0.71[a]
7.	Developing youth/adult partnerships.	1.44	0.53[a]
8.	Youth learning the value of their service.	1.44	0.53[a]
9.	Developing decision making skills.	1.44	0.73[a]
10.	Teaching responsibility.	1.44	0.88[a]
11.	Developing communication skills.	1.78	0.83[a]
12.	Giving youth a feeling of competency.	1.78	0.83[a]
13.	Developing organizational/planning skills.	1.89	0.99[a]
14.	Allowing youth to work with other agencies; networking.	1.89	1.05[a]
15.	Youth building self-esteem.	1.89	1.83
16.	Learning about and feeling connected to the community.	2.00	0.87[a]
17.	Incorporating many volunteers in community and networking capacity.	2.11	0.60[a]
18.	Youth using school and 4-H knowledge to help others.	2.11	0.60[a]
19.	Good publicity for 4-H.	2.44	1.33[a]
20.	Creating new friendships among youth.	2.67	1.32[a]
21.	Recognition/community awareness of service activities.	2.78	1.86
22.	Having fun.	2.78	1.86
23.	Personal/emotional rewards.	3.11	1.69
24.	Teaching youth about evaluation and how it benefitted the community.	3.22	2.33
25.	Learning how to help the environment and why it is important.	3.25	1.49[a]
26.	Youth learning trade skills: painting, building, etc. (depending on project).	3.78	1.48[a]
27.	Allowing senior 4-H'ers volunteer hours they need for scholarships and job applications.	4.00	2.24
28.	That 4-H has a lot of good resources.	4.13	1.81
29.	Securing new funding sources to acquire new educational materials and resources in the county.	4.56	2.83
30.	That a little money given here can make a big difference in other countries.	4.56	2.92

Note. Likert scale: 1 – 2.49 = Important; 2.5 – 4.99 = Slightly Important; 5 – 5.99 = Uncertain; 6 – 7.49 = Slightly Unimportant; ≥ 7.5 = Unimportant.
[a] Consensus of Group.

Many of the benefits identified in this study, particularly those related to civic attitudes and skills, correspond to those revealed by Melchoir (1999) and Scales and Leffert (1999). However, this study also discovered several new benefits of community-based service-learning as it relates to 4-H Youth Development. These benefits included *learning leadership skills*, *teaching solid values*, *developing organizational/planning skills*, and *working in youth/adult partnerships*. One may conclude that many of these benefits were identified because of the organization through which the service-learning occurred. As a community-based organization, 4-H engages youth in a variety of activities. Service-learning projects in 4-H can focus on developing life skills instead of enhancing academic material. In addition, the statewide 4-H program in Tennessee places strong emphasis on youth leadership and youth/adult partnerships that may not be part of a school atmosphere. Although the benefits of service-learning may be similar in both school-based and community-based efforts, participants in a community-based organization such as 4-H may place more importance on certain benefits than do school-based participants.

Recommendations

Based on the results of this study, recommendations can be made for the statewide 4-H Youth Development program in Tennessee. 4-H Youth Development should sustain and expand the existing service-learning initiative in order to help youth and adults develop a habit of service, meet community needs, learn skills, take an active role in their communities, and garner other benefits of service-learning. State 4-H Youth Development staff should provide training, resources, and technical assistance to regional and county Extension staff, volunteers, and 4-H youth to assist them in planning and implementing effective service-learning projects. Resources should include printed and Web-based manuals on the basics of service-learning, tools for service-learning reflection, evaluation instruments to aid in program improvement, and a compilation of "best practices" from effective 4-H service-learning projects.

Questions for Further Study

Several questions have surfaced as a result of this study. Researchers should study the outcomes of service-learning in 4-H Youth Development. In addition, researchers should examine the effect that the certain factors may have on the benefits of service-learning for the youth, the community, and the 4-H Youth Development program.

1. What impact does location (i.e., rural, urban, limited resource community) have on the benefits of service-learning?
2. How does the length of a project affect the benefits of service-learning?
3. How do reflection activities included as integral part of projects impact the benefits of service-learning?
4. To what extent does the degree of youth leadership in a project affect the benefits of service-learning?

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READING STRATEGIES AND TEXTBOOK USE IN AGRICULTURAL EDUCATION

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Abstract

Agriscience teachers are increasingly being called upon to demonstrate their contributions to student achievement in math, science, and reading. This national survey of 216 agriscience teachers investigated the current attitudes and practices related to reading in agriscience. Agriscience teachers generally appreciated reading for personal development and learning, but were in less agreement about allocation of time for reading. Further, teachers agreed that reading was important in agriscience, but were in less agreement about their role in teaching content area reading strategies. Reading is a fundamental part of instruction in agriscience, with nearly 20% of class time being devoted to reading. Teachers exhibited limited knowledge of, confidence in, and frequency of reading strategy use. Teachers understood how to select textbooks and how to assess student comprehension. Indications suggested that teachers helped students monitor comprehension and activate background knowledge prior to reading.

Introduction

Students need literacy skills for succcessful careers, households, citizenship, and personal lives (D'Arcangelo, 2002; Meltzer, 2001; National Reading Panel, 2000; Vacca, 2002). Good readers internalize information, make critical decisions, form opinions, and respond intelligently (D'Arcangelo), which are necessary skills for analyzing and comprehending the plethora of knowledge and facts available today (Moore, Bean, Birdyshaw, & Rycik, 1999; Vacca). Yet, American students compare poorly with their foreign counterparts, especially where content knowledge and literacy is central to the curriculum (Snow, 2002).

Reinforcing reading is a shared responsibility among all teachers (Readence, Bean, & Baldwin, 1998; Vacca, 2002). As a student moves from middle to high school, students must become more adept at meeting the challenges of more sophisticated content area reading and information (Meltzer, 2001; Musthafa, 1996; Snow, 2002; Tomlinson, 1995). Even though building literacy skills enhances learning, few content area teachers employ reading strategies (Barry, 2002; Durkin, 1978).

Content area teachers, including agriscience teachers are being called upon to enhance student achievement in math, science, and reading (Belcher, McCaslin, & Headley, 1996; Conroy & Walker, 2000). Thus, how do agriscience teachers perceive their role in developing students' reading comprehension skills? What are teacher's interest in and effectiveness of implementing content area reading strategies in agriscience? What are agriscience teachers' personal values of reading? How do agriscience teachers use texts in the classroom?

Theoretical and Conceptual Framework

The RAND Reading Study Group (RRSG) (Snow, 2002) developed a research agenda for research on comprehension, which provided the theoretical framework for this study. The RRSG defined reading comprehension as "the process of simultaneously extracting and constructing meaning through interaction and involvement with written language" (p. xiii), which comprised three elements: reader, text, and activity or purpose for reading, all occurring in a larger sociocultural context, including the teacher (see Figure 1). The reader brings cognitive capabilities, motivation, knowledge, and experiences to the reading processes. Texts can include many forms. Reading activity involves the purposes, operations, and outcomes of reading, including problem solving, knowledge gain, or engagement. Context comprises the student's sociocultural environment which encompasses the classroom, teacher, community, and world.

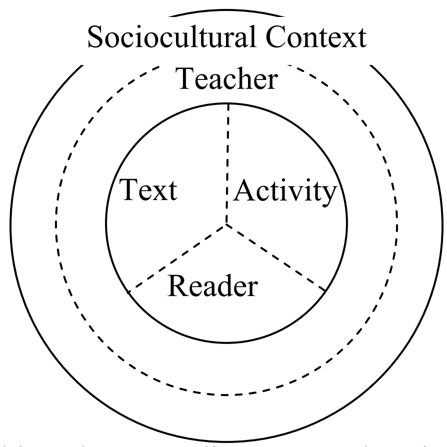

Figure 1. A Heuristic for Thinking about Reading Comprehension (Snow, 2002).

Teachers are often reluctant to implement reading strategies in the content areas, because they 1) feel inadequate to handle reading problems in their classrooms, 2) feel that reading instruction infringes on content area time, and 3) deny the importance of reading techniques (Barry, 2002; Bean, 1997; Bintz, 1997; Durkin, 1978; Ivey, 2002; Moore et al., 1999; Snow, 2002; Stewart, 1990; Stewart & O'Brien, 1989). Because content area teachers expect students to possess adequate reading skills, they perceive their role in education to be content area experts (D'Arcangelo, 2002; Forget & Bottoms, 2000; Moore et al.; Snow; Vacca, 2002; Vaughn, Klinger, & Bryant, 2001). O'Brien and Stewart (1990) found that 85% of preservice agriscience teachers rejected content area reading. Choosing to ignore reading as a tool (p. 118), agriscience teachers felt they reinforced content area reading and needed little instruction in strategies.

A teacher's attitude toward reading affects student reading performance (Bintz, 1997; Jorgensen, 2001; Morawski, 1995; Readence et al., 1998). Digisi (1993) found that 215 biology teachers viewed reading as essential to learning biology, yet lacked knowledge of strategies and how to incorporate them. Surveying 61 mixed-experience teachers, Menke and Davey (1994) found that experienced teachers provided more class time for reading, used text less often to supplement instruction, and exhibited less reading strategy instruction.

Purpose and Objectives

The purpose of this national study was to describe practices and attitudes associated with reading in agriscience. Specifically, the study pursued the following objectives:

1. To ascertain the emphasis on and importance of reading in the secondary agriscience,
2. To identify how teachers select and use textbooks, and
3. To identify content area reading intervention strategies employed by teachers.

Procedures

This study used a sample of the population of active and life members of the National Association of Agricultural Educators (NAAE) as listed in the 2003-04 database of membership provided by the NAAE ($N = 6586$). From the accessible population a random sample of 367 members was selected to estimate the distribution of characteristics within the population (Dillman, 2000).

The researcher-developed questionnaire consisted questions related to the objectives of the study and was reviewed by two content area reading experts to establish face and content validity. To ensure construct validity and reliability, the survey instrument was administered to 14 agriscience teachers. Reliability for attitudinal and behavioral items ranged from 0.77 to 0.88. Because other items involved questions for which respondents had "an accurate, ready-made answer" (Dillman, 2000, p. 37), items did not elicit demands for considerable time, thought, nor variation, and thus posed no considerable reliability risk.

Data was collected from February 26, 2004, through May 4, 2004. The study was administered via the suggested survey design with a mailed questionnaire as outlined by Dillman (2000). Teachers were mailed a cover letter from the investigators, a letter from National FFA Advisor Dr. Larry Case, the questionnaire, and a two-dollar incentive to enhance response, resulting in 216 returned usable questionnaires for a 58.9% response rate.

To control for non-response error, researchers compared early to late responders (Ary, Jacobs, & Razavieh, 2002; Linder, Murphy, & Briers, 2001). Research has shown that late responders are often similar to early responders (Goldhor, 1974; Krushat & Molnar, 1993). Early responders were those participants who returned their survey prior to mailing the reminder postcard, while late responders were those who responded after the second questionnaire was mailed. Researchers compared respondents based on gender, years of teaching experience, education level, college reading course completion, and the summated means of personal attitude toward reading, attitude toward reading in agriscience, and general approach to reading. No significant differences existed between early and late responders.

Findings

Respondents represented 44 states and consisted of 84.6% males who held standard or permanent teaching licenses (96.7%). Years of teaching experience ranged from one to 39 years and averaged 17.4 years. High school teachers represented 80.1% of the sample. On average teachers taught 6.03 agricultural education courses and 0.25 non-agricultural education courses. Over one-third of the sample held bachelor's degrees (35.7%), 62.9% held master's degrees, and 1.4% held degrees above the master's level. A college content area reading course was completed by 38.8% of teachers.

Related to objective 1, teachers were asked about their attitudes toward reading (see Table 1). Internal consistency for the construct was α = 0.88. Agreement on the nine construct

Table 1
Teachers' Personal Reading Attitudes and Attitudes Toward Reading in Agriscience (n = 211)

Attitude Statements	Agree[b]	Undecided	Disagree[b]	*M*[c]	*SD*
Personal reading attitude					
Reading is a good use of time.[a]	96.7%	0.5%	2.9%	4.78	0.69
A person learns a lot from reading.[a]	96.2	1.0	2.9	4.78	0.71
Reading has been useful for my personal development.	90.1	5.2	4.8	4.42	0.88
Reading is almost never boring.[a]	84.1	10.6	5.2	4.35	0.92
Books help us understand other people and ideas.	86.6	6.7	6.7	4.24	0.98
I enjoy reading.	81.5	11.9	6.7	4.17	0.92
Reading for pleasure is one of my hobbies.	52.7	21.1	26.3	3.41	1.25
I make time for reading every day.	40.5	21.9	37.7	3.08	1.26
I do not have enough time to read books.	23.3	27.6	49.1	2.66	1.16
Attitude toward reading in agriscience					
Reading is important in agriscience.	93.4	4.3	2.4	4.44	0.69
Reading textbooks, magazines, and other publications is necessary for success in agriscience.	94.3	2.8	2.8	4.41	0.69
Reading is important for success in agriscience.[a]	90.5	1.9	7.5	4.41	1.01
Agriscience teachers should reinforce effective reading strategies.	91.4	6.2	2.3	4.35	0.76
Agriscience teachers are responsible for developing students' reading skills.[a]	81.5	10.0	8.5	4.09	0.98
Good instruction in agriscience involves teaching reading strategies.	60.7	29.9	9.4	3.71	0.92
Agriscience teachers are responsible for teaching reading skills.	47.8	27.5	24.6	3.32	1.09

[a]Presented as a negatively stated items, but positively stated and reverse-coded data analysis.
[b]Strongly agree and agree were collapsed into agree column. Strongly disagree and disagree were collapsed into the disagree column. [c]1 = Strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, 5 = strongly agree.

items ranged from 96.7% to 23.3% with means ranging from 4.78 to 2.66. Teachers generally agreed with the value of reading (over 80% agreement), but were in less agreement as to their personal engagement with reading as a hobby or on a daily basis (less than 60% agreement). Teachers were also asked about their attitudes related to reading in agriscience. Internal consistency for the construct was α = 0.77. Teachers generally agreed that reinforcing reading was part of the responsibility of agriscience teachers (over 80% agreement), but were in less agreement for actually teaching reading skills (less than 80%).

Objective 2 sought to determine how teachers select and use texts. Related to this objective, 91.1% of teachers said that their agriscience program used textbooks. A classroom set of texts was available in 90.1% of classrooms, while students were assigned individual texts in 38.0% of classrooms. Trade books were used by 49.5% of teachers. Teachers selected textbooks 90.6% of the time, while the agricultural advisory committee and school boards were also involved (19.3% and 11.3%, respectively). Texts were generally replaced every five to seven years (58.9%) and as needed (24.4%).

Also related objective 2, teachers were asked to rate the frequency (fraction of class meetings per week) and intensity (minutes per use) of textbook use in their agriscience courses (see Table 2). Teachers used textbooks most frequently in animal science, introductory level, middle school, natural resource management, horticulture, and plant science courses (greater than 20% used texts on a daily basis). Teachers used textbooks most intensively in animal science, introductory level, agricultural mechanics, plant science, and middle school courses (greater than 30% of teachers used texts for 25 minutes per use).

Table 2
Percent Frequency and Intensity of Textbook Use in Agriscience Courses (n = 216)

		Frequency					Intensity				
Course	*n*	0	¼	½	¾	daily	5	10	15	20	25
Animal science	149	1.3	17.4	33.6	18.8	28.9	2.7	3.4	28.6	29.3	36.1
Introductory level	108	4.6	22.2	27.8	20.4	25.0	2.8	15.9	21.5	25.2	34.6
Middle school	33	15.2	33.3	12.1	15.2	24.2	24.2	18.2	9.1	18.2	30.3
Natural resource mgt.	89	4.5	23.6	32.6	15.7	23.6	5.7	9.1	36.4	22.7	26.1
Horticulture	122	4.1	23.0	34.4	18.0	20.5	3.4	12.6	25.2	31.1	27.7
Plant science	119	2.5	25.2	32.8	19.3	20.2	2.6	8.6	28.4	29.3	31.0
Floriculture	70	1.4	31.4	37.1	11.4	18.6	4.4	7.4	27.9	32.4	27.9
Agribusiness mgt.	92	2.2	39.1	23.9	17.4	17.4	3.3	15.2	27.2	30.4	23.9
Ag mechanics	128	4.7	47.7	16.4	14.1	17.2	8.1	22.0	19.5	17.1	33.3
Farm mgt.	65	0.0	41.5	24.6	18.5	15.4	6.5	22.6	21.0	24.2	25.8
Ag communications	48	8.3	41.7	22.9	12.5	14.6	6.4	21.3	36.2	17.0	19.1
Landscape mgt.	88	8.0	30.7	31.8	15.9	13.6	6.0	16.7	25.0	28.6	23.8
Ag leadership	112	6.3	34.8	38.4	8.9	11.6	6.5	20.6	30.8	23.4	18.7
Food science	35	8.6	51.4	17.1	11.4	11.4	5.9	29.4	17.6	23.5	23.5
Soil science	84	3.6	35.7	32.1	19.0	9.5	6.0	12.0	34.9	27.7	19.3
Biotechnology	54	9.3	44.4	24.1	13.0	9.3	9.4	22.6	26.4	22.6	18.9
SAE	118	18.6	40.7	22.9	11.9	5.9	17.7	25.7	30.1	11.5	15.0

Using the mean frequency and intensity of textbook use, the researchers computed the total amount and percent of class time per week spent using textbooks based on 250 minutes of instruction per week (see table 3). The weighted means were 51.8% of class periods per week, 17.7 minutes per use, 45.7 total minutes per week, and 18.3% of total class time. Teachers spent more than 50 minutes per week using textbooks in animal science, introductory level, plant science, horticulture, and natural resource management courses. They spent less than 40 minutes per week using textbooks in middle school, agricultural leadership, agricultural communication, food science, biotechnology, and Supervised Agricultural Experience (SAE) courses.

Objective 2 also regarded teachers' selection of textbooks. Teachers were asked about criteria for textbook selection (see Table 4). Mean agreement ranged between 4.68 and 2.50. Means over 4.50 were found for current and relevant information, readability, and overall interestability to students. Items with the lowest agreement (less than 3.50) were for recommendations from the university, statewide textbook adoption, and the publishing company.

Table 3
Use of Textbooks in Agriscience Courses

		M			
Course	*n*	Frequency (percent)	Intensity (minutes)	Time/week (minutes)	Class time (percent)
Animal science	149	64.2	19.7	63.0	25.2
Introductory level	108	59.8	18.6	55.7	22.3
Plant science	119	57.4	18.9	54.1	21.6
Horticulture	122	57.0	18.4	52.3	20.9
Natural resource mgt.	89	57.6	17.7	51.0	20.4
Floriculture	70	53.6	18.6	49.8	19.9
Agribusiness management	92	52.2	17.8	46.5	18.6
Farm management	65	52.0	17.0	44.2	17.7
Landscape management	88	49.1	17.4	42.7	17.1
Soil science	84	48.7	17.1	41.7	16.7
Agricultural mechanics	128	47.9	17.3	41.4	16.5
Middle school	33	50.0	15.6	39.0	15.6
Agricultural leadership	112	46.2	16.4	37.8	15.1
Agricultural communication	48	45.9	16.1	36.8	14.7
Food science	35	41.4	16.5	34.0	13.6
Biotechnology	54	42.2	15.9	33.6	13.4
SAE	118	36.5	14.0	25.6	10.2
Weighted mean	---	51.8	17.7	45.7	18.3

Objective 3 sought to determine how teachers used content area reading strategies and which reading strategies were implemented in agriscience. Reliability for this construct was $\alpha = 0.87$. Researchers asked teachers 13 questions related to the application of general approaches to reading (see Table 5). Means for the general approaches to reading ranged from 3.85 to 2.24. Percent *often* and *always* ranged from 73.4% to 15.3% for the approaches to reading.

Summarizing was taught by 73.4% of teachers, followed by determining important ideas (60.8%), generating questions (58.1%), defining unfamiliar words (57.6%), and identifying the purposes for reading (51.4%). The fewest teachers taught students to think aloud while reading (15.3%), make predictions (18.8%), and use more than one reading strategy (28.5%).

Also related to objective 3, teachers were asked about their knowledge of, confidence in, and frequency of implementation of a series of 11 specific reading strategies (see Table 6). Teachers' knowledge of reading strategies ranged from 1.16 to 3.05 with zero being *none* and five representing *expert* knowledge. Agriscience teacher's confidence in the use of reading strategies ranged from 1.17 to 3.04 with zero representing *no* confidence and five representing *expert* confidence. The range of strategy use per week was 1.80 to 0.14 strategies per week. Agriscience teachers used an average of 6.78 reading strategies per week.

Table 4
Mean Criteria for Textbook Selection in Agriscience (n = 212)

Criteria	*M*[a]	*SD*
Current and relevant information	4.68	0.524
Readability	4.55	0.586
Overall ability to interest students	4.54	0.595
Curriculum associated with the text	4.42	0.786
Organization and structure	4.40	0.664
Vocabulary	4.24	0.706
Graphics	4.19	0.706
Pictures	4.13	0.773
Associated curriculum materials (overheads, handouts, etc.)	4.03	0.997
Recommendations from other agricultural education teachers	4.03	0.963
Overall appearance	3.74	1.046
Price	3.67	1.154
Supplemental websites	3.56	1.189
Recommendations from the university agricultural education program	3.26	1.163
Statewide textbook adoption	2.90	1.453
Publishing company	2.50	1.249

[a]1 = strongly disagree and 5 = strongly agree.

Table 5
Percent Application of General Approaches to Reading (n = 206)

In my agricultural education courses, students are taught to…	Often & Always	Occ.	Never & Seldom	*M*[a]	***SD***
…summarize what they read.	73.4	17.6	9.0	3.85	0.92
…determine important ideas.	60.8	29.7	9.5	3.64	0.94
…generate questions about the text.	58.1	26.4	15.4	3.54	1.04
…define unfamiliar words during reading.	57.6	27.1	15.2	3.57	1.08
…identify their purpose for reading.	51.4	33.3	15.2	3.44	1.04
…use text structure to build comprehension.	41.3	34.0	24.8	3.12	1.10
…monitor comprehension during reading.	40.4	37.0	22.6	3.17	1.04
…create visual representations to aid comprehension and recall.	38.1	37.1	24.8	3.13	1.12
…preview texts before reading.	35.1	28.4	36.5	2.92	1.21
…activate background knowledge.	34.5	36.4	29.2	3.02	1.10
…use more than one reading strategy.	28.5	33.3	37.7	2.81	1.11
…make predictions before reading.	18.8	33.3	48.1	2.58	1.03
…think aloud while reading.	15.3	22.4	62.4	2.24	1.10

[a]Never = 1 and daily = 5.

Table 6
Mean Knowledge of, Confidence in, and Frequency of Use of Reading Strategies (n = 216).

Strategy	Knowledge		Confidence		Frequency	
	M[a]	*SD*	*M*[a]	*SD*	*M*	*SD*
Study guides	3.05	1.27	3.04	1.34	1.80	1.54
Guided reading procedure	2.28	1.29	2.27	1.34	1.11	1.36
Reciprocal teaching	2.18	1.11	1.69	1.08	.61	1.12
Graphic organizers	2.13	1.30	2.07	1.30	.95	1.50
Collaborative strategic reading	2.06	1.10	2.01	1.09	.91	1.21
K-W-L	1.49	1.00	1.43	0.91	.31	0.79
Jig-sawing	1.43	0.89	1.41	0.90	.27	0.76
SQ3R	1.34	0.78	1.32	0.77	.26	0.78
Cornell notes (2- or 3-column notes)	1.28	0.72	1.27	0.73	.21	0.71
Socratic seminar	1.22	0.63	1.26	0.72	.21	0.65
Directed reading-thinking activity	1.16	0.55	1.17	0.57	.14	0.54

[a]1 = none and 5 = expert.

Table 7
Correlations between Demographic Variables and Reading Criteria

	1	2	3	4	5	6	7	8	9	10
Education	---	-.07	.20**	-.03	.14	.07	.12	.05	.06	.02
1. College reading course		---	-.14*	-.06	.11	.03	-.03	.13	.20**	.23**
2. Years teaching experience			---	.40**	.00	.16*	.03	-.08	-.19**	.01
3. Gender				---	.00	.05	-.13	-.10	-.18**	.03
4. General approach to text use					---	.29**	.12	.27**	.34**	.39**
5. Attitude toward agriscience reading						---	.29**	.20**	.17*	.21**
6. Personal attitude toward reading							---	.09	.11	.09
7. Knowledge of reading strategies								---	.95**	.61**
8. Confidence in use of reading strategies									---	.80**
9. Frequency of use of reading strategies										---

*Correlation significant at α < .05 level. **Correlation significant at α < .01 level.

Correlation analyses were done comparing demographic variables to constructs of interest related to teachers' attitudes toward reading (see Table 7). Using the conventions provided by Davis (1971), education had a low positive correlation with years of teaching experience. Completion of a college content area reading course provided low positive correlations with confidence in the use of reading strategies and frequency of use of reading strategies. Completing a college reading course also had a low negative correlation with years of teaching experience. Knowledge of reading strategies had a very high positive correlation with confidence in using reading strategies, a substantial positive correlation with frequency of use of strategies, and low positive correlations with attitude toward reading in agriscience and general approach to text use. Confidence in use of reading strategies had a substantial positive correlation with frequency of text use, a low positive correlation with attitude toward reading in agriscience, a moderate negative correlation with general approach to text, and low negative correlations with gender and years of teaching experience. Frequency of strategy use had a moderate positive correlation with general approach to text use and a low positive correlation with frequency of strategy use. Personal attitude toward reading had a low positive correlation with attitude toward reading in agriscience. Attitude toward reading in agriscience had low positive correlations with years of teaching experience and general approach to text use. Gender had a moderate positive correlation with years of teaching experience.

Conclusions

Agriscience teachers in this study generally valued reading as a meaningful activity for learning, personal development, and enjoyment. However, they were not in agreement as to their allotment of daily time for engaging in reading. These agriscience teachers also placed high value on reading in agriscience, but were in less agreement as to their role and responsibility in teaching students reading skills. Prior research indicates that content area teachers perceive their responsibility to instruction about content, not teaching reading strategies (D'Arcangelo, 2002; Forget & Bottoms, 2000; Moore et al., 1999; Snow, 2002).

Teachers generally understood how to select textbooks and selected texts based upon appropriate criteria, including current and relevant information, readability, and interestability for students. Teachers allocate approximately 15-20% of their class time to using textbooks on a weekly basis. Classes where texts are more heavily utilized included animal science, introductory level, middle school, natural resource management, horticulture, and plant science courses. Predictably, teachers used texts least in SAE courses.

When approaching reading, teachers taught students to summarize, determine the important ideas, generate questions, define unfamiliar words, and identify their purpose for reading. Teachers did not regularly teach students to activate background knowledge, use more than one strategy, make predictions, or think aloud. Teachers possessed limited knowledge of specific reading strategies. Teachers were most knowledgeable and confident in use of study guides with lesser knowledge and confidence with the remainder of the reading strategies.

Knowledge of reading strategies, confidence in their use, and frequency of strategy implementation demonstrated the highest positive correlations in this study. However, completing a college reading course was positively correlated with knowledge and confidence in reading strategy use, as was the teacher's attitude toward reading in agriscience. A teacher's general approach to text use was positively correlated with his or her attitude toward reading, frequency of strategy use, and knowledge of reading strategies.

Recommendations

Modeling an appreciation for reading and use of reading strategies encourages students to read and implement strategies. Agriscience teachers should be encouraged to model reading for their students, as well as incorporate reading strategies in classroom instruction. To further this aim, teacher educators can reinforce effective active reading strategies in their teaching methods courses and teach about proper text use, text selection, and general approaches to reading. Teacher education students should also be encouraged to complete content area reading courses as part of their plans of study.

Being called upon to demonstrate contributions toward student achievement (Belcher et al., 1996; Conroy & Walker, 2000), agriscience teachers can contextualize the reading experiences of students by implementing reading strategies when using texts in agriscience. As textbooks are utilized in nearly 20% of agriscience class time, agriscience teachers should learn and implement effective strategies for using this learning tool. Further research is needed in this area of inquiry in agriscience education. What are teachers' specific attitudes toward reading? How do teachers perceive their role in reinforcing content area reading strategies? How prepared are teachers to enhance students' reading?

Discussion and Implications

Teachers in this study generally agreed with the importance of reading from a personal and professional standpoint. However, they indicated less agreement as to the actual allocation of time to personal reading and less agreement as to their responsibility for actually teaching reading skills. The disconnection between attitude and behavior toward reading may give an indication as to the culture of reading in secondary agriscience.

While agriscience teachers in this study indicated textbook selection was based primarily upon current and relevant information and readability, two implications come forth. First, textbooks by nature contain questionably current information. On the other hand, trade books, magazines, and journals often contain more current information, yet teachers indicated that they used these sources of information least. Secondly, trade books and magazines are sold to the general public, thus they are often easier to read and more interesting. Additionally, these are the forms of text to which students will refer in their futures as lifelong learners.

Reading involves three microperiods: pre-reading, during reading, and post-reading (Snow, 2002). Content area teachers have traditionally excelled in assessing post-reading activities, such as summaries, quizzes, and questions from the end of the chapter (Durkin, 1978), but have implemented fewer pre-reading and during reading strategies. The agriscience teachers in this study would indicate the same. If one divided the responses from the general approaches to text use into the three microperiods, agriscience teachers implemented post-reading strategies most frequently, with during reading and pre-reading strategies lagging behind. Students who fail to understand the purposes of reading and neglect to monitor comprehension while reading will also struggle with assessments following reading.

Among the implications for this study is the need for teacher educators to ensure that content area reading strategies are a facet of the preservice experience. Further, teacher educators should do their part in reinforcing content area reading by implementing reading strategies, demonstrating an appreciation for reading, and helping students navigate the myriad of text options in agriscience.

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USING CD-BASED MATERIALS TO TEACH TURFGRASS MANAGEMENT: AN ASSESSMENT OF THE *TURF FOR TEXANS* MASTER GARDENER CURRICULUM

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Abstract

Cooperative Extension educators have the task of educating the public about issues relevant to agriculture, family and consumer sciences, youth development, and community development. Traditionally, these programs have been delivered in face-to-face workshop settings. In recent years, educators have increasingly used new technologies for program delivery. One technique that has not been explored thoroughly is the CD-ROM. Using a curriculum designed to teach turfgrass management to Master Gardeners, researchers sought to determine if learning differed between students taught using CD-based materials versus those taught in traditional workshops. Using a pre-test/post-test design, learning of 94 students in six counties was measured. Results indicated that CD-based materials were more effective in teaching advanced turfgrass management topics to Master Gardener trainees. The use of CD-based materials in Extension programming could increase the number of clientele reached and enhance their learning experiences.

Introduction

The Smith-Lever Act of 1914 created the Cooperative Extension Service to educate the public about agriculture, home economics, rural energy, and related subjects. Practical application and transfer of research knowledge is the key to cooperative extension work. The transfer of knowledge can be accomplished through public demonstrations, workshops, youth activities, and publications (Smith-Lever Act, 1914). Since the early 1900s, new technologies such as computer applications, e-mail communications, and World Wide Web methodologies have allowed greater access to knowledge transfer.

Nine compact disc (CD)-based modules in turfgrass management titled, *Turf for Texans*, were developed by the Departments of Soil and Crop Sciences and Agricultural Education at Texas A&M University. The *Turf for Texans* CD is a tool for teaching turfgrass management to Texas Master Gardeners. While some programs are using World Wide Web methodologies (Rost & VanDerZanden, 2002), the *Turf for Texans* program chose the CD-format to forego connectivity problems in rural areas (Federal Communications Commission, 2004). The goal of the *Turf for Texans* CD was to allow extension personnel to convey a consistent curriculum to a large number of people with less travel, therefore at a lower cost (M. Hussey, personal communication, November 22, 2002). The ability to reach more clientele at a lower cost is important, but participants must also receive quality-learning experiences (D. Chalmers, personal communication, May 29, 2003).

Master Gardener training sessions are generally conducted in face-to-face workshops. The Trans-Texas Videoconference Network (TTVN) and digital slide presentations were used when necessary to train Master Gardeners (2002 Texas Master Gardener Report, 2003). Although these technologies are being used currently, other options remain available. One available technology, the compact disk, is not being used to its fullest potential. CD-based training formats provide flexibility for both instructor and participants.

Conceptual Framework

Cooperative Extension has used various learning formats to deliver educational programs. The formats included closed circuit television, cable television, satellite television, and World Wide Web methodologies. Research in Indiana (Branson & Davis, 1985), Minnesota (Sunnarborg, Bradley, & Haynes, 1988), New York (Staats, 1995), Missouri (Warmund & Schrock, 1999), Pennsylvania (Swistock, Sharpe, & Dickison, 2001), and Oregon (Rost & VanDerZanden, 2002) have examined extension clientele education for learning comprehension in non-traditional settings.

Among the first alternative delivery programs used by the Cooperative Extension Service, closed circuit television was used to teach swine breeding topics to extension clientele in Indiana. Topics included reproduction, housing, nutrition, and disease immunity. The closed circuit television sessions replaced county swine meetings. A pre-test/post-test was used to measure learning comprehension. Results of the study showed participants' learning scores increased by over 27% (Branson & Davis, 1985). This early research illustrated that extension clientele were open to using new technologies to learn technical agricultural content.

A program on weight control and exercise was delivered via cable television to 300 community leaders from northeastern Minnesota (Sunnarborg, Bradley, & Haynes, 1988). Fifty experimental subjects were selected from the pre-registrants, while 50 control subjects were selected from previous extension program participants. The control group was not allowed to view the cable television program. A pre- and two post-tests were administered to the groups. A total of 25 control and 21 experimental subjects completed all the tests. The experimental group increased their knowledge scores by 23%. The experimental group also had a higher percentage of participants who followed a planned exercise plan after the program. Participants from each group exercised three or more times a week and reduced their caloric intake. Television was used effectively to teach weight control and exercise issues to extension clientele.

Satellite technology replaced a specialists' training program on maple syrup production in New York. Although learning levels were not tested, participant satisfaction with the program was evaluated. Staats (1995) found that most participants indicated high levels of satisfaction with the satellite broadcasts. It also was found that specialists' time commitments and travel costs were reduced by approximately 90% of the seminar costs. While the study pointed out many positive aspects of the satellite broadcasts, it also noted that transmission problems and potential audience member loss were problems related to the satellite format (Staats, 1995). While distance education methods can be successful in teaching technical material, educators need to be cognizant of possible obstacles related to alternative learning formats.

Missouri researchers (Warmund & Schrock, 1999) conducted a study on perceptions of Master Gardener training delivered via interactive television versus face-to-face instruction. Learning levels were not measured in this study. When asked about the delivery method and ease of learning, a majority of the face-to-face participants felt it would be easier to learn the material in a face-to-face setting. Meanwhile, one-third of the interactive television students felt there would be no difference or that using the interactive television would make learning easier (Warmund & Schrock, 1999). Distance education methods were seen as acceptable delivery formats for Master Gardener training in Missouri.

A traditional water quality workshop was compared with a satellite broadcast in Pennsylvania. Swistock, Sharpe, and Dickison (2001) found the satellite program to be as effective as the traditional workshop. The objective of having 20% of the participants' test their water after the program was met easily by both the traditional and satellite students. Researchers also measured how many attendees learned at least two new ideas in both formats. Results indicated that twice as many individuals in the satellite program learned two new ideas when compared to learners in the traditional workshop. Also, the cost of the satellite program was 2.3 times less than the cost of the traditional workshop sessions. Distance education formats can be as effective, and less expensive to deliver, as traditional face-to-face workshops.

Rost and VanDerZanden (2002) used an online module on basic soils, developed for the Oregon State University Extension Service Master Gardener Program, to compare learning performances among two groups of extension clientele. One group of participants completed the online module at home, while another completed the module in a face-to-face classroom setting. Learning of basic soils was evaluated using the pre-/post-test design. Researchers found no significant differences in learning levels between the two groups. Instructional delivery format was not a factor in learning comprehension.

The aforementioned studies demonstrate a variety of research on learning in formal and nonformal educational settings using various instructional delivery formats. However, no studies have been found where research was conducted that tested learning levels of extension clientele using the CD-based format.

Purpose and Objectives

The purpose of this study was to determine if Texas Master Gardener program participants' learning levels differed when taught nutrient, water, and pest management topics using CD-based materials versus traditional workshop materials. The following objectives guided this study.

1. Compare learning between Master Gardeners taught in face-to-face workshop settings versus those taught using CD-based materials.
2. Evaluate students' satisfaction with the instructional materials.

Procedures

A pre-test/post-test experimental design was used to test the effect of extraneous factors (Borg & Gall, 1989) in this study. The experimental group was Master Gardener participants receiving turfgrass management training via a CD-based curriculum. The control group consisted of Master Gardener participants receiving turfgrass management training in a face-to-face workshop setting. Approval to conduct this study was granted through the Texas A&M University Institutional Review Board (#2004-0035).

The population for this study was 107 Master Gardener county programs, provided by the Texas Master Gardener Program office. A proportional stratified sample (Borg & Gall, 1989) was drawn to ensure appropriate representation for Master Gardener programs in all 12 Texas Cooperative Extension Districts. Using demographic averages in race, income, and education level, test programs were chosen that best represented each of the 12 extension districts. Based on the distribution of programs throughout the state, one test program out of every ten programs would represent each district. Therefore, 16 test programs statewide were considered for the sample.

Electronic mail notices and phone calls were used to solicit participation in the study from the extension agent responsible for the Master Gardener program in each county selected to participate. Overall, six counties participated in the study, resulting in a response rate of 37.5%. These counties represented four of the 12 Cooperative Extension Districts in Texas. Counties that chose not to participate in the study indicated that their programs were complete, they did not have an active Master Gardener program, or their programs were held during the fall.

Three of the nine *Turf for Texans* modules, including Nutrient Management, Irrigation Matters in Texas, and Pests and Integrated Pest Management (IPM) were tested. Three separate researcher developed instruments were used for this study. The pre-test instrument contained three parts. The first section included turfgrass management knowledge and perception questions developed by the researcher, a turfgrass graduate student, and the Texas Cooperative Extension state turfgrass specialist. The questions were equally distributed between nutrient, water, and pest management in turfgrass. Both recall and application questions were included. Examples of questions included: (a) *what is the most appropriate way to determine the amount of nutrients to be applied to your lawn*; (b) *what is potential evapotranspiration*; and (c) *what is integrated pest management*. Perception statements were answered using a four-point Likert-type scale ranging from strongly disagree (1) to strongly agree (4). Statements included: (a) *I appreciate turf in the landscape*; (b*) I am confident in measuring and applying water to my lawn*; and (c) *I confidently give advice on IPM to other homeowners*. The second section of the instrument consisted of community participation questions (not a part of this report), while the third section collected demographics including age, gender, education, ethnicity, and computer experience.

The workshop post-test instrument and the CD post-test instrument consisted of two parts. The first part contained the same turfgrass knowledge and perceptions questions as presented in the pre-test instrument. The order of the questions and answers was changed from the pre-test. The second part contained questions used to evaluate the program. Participants were asked to rank nine statements using a four point Likert-type scale. The scale ranged from strongly disagree (1) to strongly agree (4). These statements included: (a) *the information was* *easy to understand*; (b) *the information will help me in giving advice to other homeowners*; and (c) *the information presented was relevant to my geographic location*. One statement related to navigation was relevant only to the CD-based materials, while another related to the presenter was relevant only to the workshop presentation. CD-based participants were asked to evaluate both the workshop and the CD-based training settings. A second scale allowed CD-based participants to evaluate the usefulness of the components (video, audio, handouts, etc.) used in the CD-based materials. The scale was a four-point scale that ranged from not useful (1) to very useful (4). Three other questions regarded the usefulness of the information, behavior change, preference for training, and satisfaction with the program. Reliability for the knowledge portion was calculated using the Kuder-Richardson 20 method, resulting in a KR-20 alpha coefficient of .68. Content validity was determined by a panel of experts in the Departments of Soil and Crop Science and Agricultural Education at Texas A&M University.

Participants had two options for training. Master Gardener participants completed the workshop entirely in a face-to-face setting, or completed two-thirds of the workshop in a face-to-face setting and one-third using the CD-based materials. The Texas Cooperative Extension state extension turfgrass specialist conducted all workshops to maintain consistency throughout the face-to-face training sessions.

After introducing the study, the pre-test was administered to all 94 participants. All participants attended the first two-thirds of the basic turfgrass training. Participants who self-selected to complete the three CD-based lessons were dismissed before the instructor began the nutrient management discussion. The remaining students continued the training in the face-to-face setting. Upon completion of the workshop, the post-test was administered to the remaining participants. Fifty-three students completed the workshop post-test.

Participants using the CD-based materials were given 10 days to complete the course. Upon completion, participants completed a post-test by connecting (via the Internet) to a secure server. E-mails were sent to the participants reminding them to complete the course and online tests. Forty three students agreed to complete the CD-based portion, but only 37 completed the online CD post-test.

Data were collected during late spring and early summer 2004. This timing was chosen to coincide with module development. It was also indicated that 75% of Master Gardener trainings were held during spring of each year (D. Welsh, personal communication, February 24, 2003). Data were analyzed using descriptive and inferential statistics.

Findings

The first objective was to compare learning between Master Gardeners taught in face-to-face workshops versus those taught using CD-based materials. Mean scores were calculated for each of the four test types. Independent samples *t*-tests were used to compare the mean scores. The tests revealed no significant differences in learning between the two pre-test types, indicating that the students had somewhat equal knowledge of turfgrass management topics prior to beginning the course. Additional *t*-tests between post-test types revealed a significant difference in learning between workshop scores and CD-based scores (Table 1). Post-test scores analyzed by individual modules (Nutrients, Water, and Pests) revealed no significant differences based on instructional delivery format (Table 2).

Table 1
Post-test Comparison of Knowledge Comprehension – All Modules

Module	Test Type	*n*	M^a	*SD*	*t*
All[b]	Workshop Post-Test	53	15.87	3.84	-2.00*
	CD-Based Post-test	37	17.38	3.01	

Note. [a]Total scores could equal 21, and ranged from two to 21. [b]Twenty-one knowledge questions related to nutrients, water, and pests.
*$p < .05$.

Table 2
Post-test Comparison of Knowledge Comprehension by Module

Module	Test Type	*n*	M^a	*SD*	*t*
Nutrients[b]	Workshop Post-test	53	5.57	1.38	-1.83
	CD-Based Post-test	37	6.05	1.03	
Water[b]	Workshop Post-test	53	5.42	1.40	-0.99
	CD-Based Post-test	37	5.70	1.31	
Pests[b]	Workshop Post-test	48	5.40	1.16	-0.79
	CD-Based Post-test	37	5.62	1.46	

Note. [a]Total scores could equal seven, and ranged from zero to seven. [b]Each module consisted of seven knowledge questions related to the subject area.

While both groups made gains, participants using the CD-based materials had higher gains from the pre-tests (M = 13.70, SD = 3.41) to the post-tests (M = 17.38, SD = 3.01) These results indicate that the CD-based materials were more effective, overall, in teaching turfgrass management topics to Master Gardeners, than were traditional workshop materials.

The second objective was to evaluate participants' satisfaction with instructional materials and format. All participants were asked to evaluate the workshop instructional format (Table 3). Participants indicated their satisfaction by agreeing or disagreeing with eight statements, measured on a four-point Likert scale (1 = strongly disagree to 4 = strongly agree). An independent samples *t*-test revealed no significant differences between participants' satisfaction levels with instructional format used to complete the course. All participants were satisfied with the workshop format. Participants were most satisfied with the presenter's knowledge of the subject matter; they were least satisfied with "ease of understanding" the information (Table 3).

Table 3
Student Satisfaction with the Workshop Instructional Format (N = 87)

Statements	Workshop (n = 50)		CD (n = 37)		Total (N = 87)	
	M^a	*SD*	M^a	*SD*	M^a	*SD*
The presenter was knowledgeable about the subject.	3.69	.47	3.65	.48	3.67	.47
The examples used were relevant and meaningful.	3.53	.50	3.38	.55	3.47	.52
The information presented was relevant to my geographic location.	3.50	.51	3.43	.55	3.47	.52
The information will help in decisions about my own situation.	3.35	.48	3.41	.50	3.38	.49
The information was presented in a logical, easy to follow manner.	3.34	.63	3.24	.60	3.30	.61
The pace of the program was appropriate.	3.18	.69	3.22	.63	3.20	.66
The information will help me in giving advice to other homeowners.	3.14	.46	3.16	.65	3.15	.54
The information was easy to understand.	2.92	.54	3.14	.48	3.01	.52

Note. [a]Four-point scale (1 = Strongly Disagree, 4 = Strongly Agree).

Participants who used the CD-based materials were asked to evaluate both the workshop and CD-based materials. Participants reported high levels of satisfaction for both types of materials. The CD-based materials were given higher ratings in five of seven categories pertaining to both instructional formats. The categories included ease of understanding, making decisions related to their own situation, giving advice to others, program pace, and presentation of the material. The results indicated that participants were pleased with the CD-based materials (Table 4).

Table 4
CD-Based Participants' Evaluation of Instructional Formats (n = 37)

Statement	CD-Based		Workshop	
	M	*SD*	*M*	*SD*
The information was easy to understand.	3.30	.52	3.14	.48
The information will help in decisions about my own situation.	3.43	.50	3.41	.50
The information will help me in giving advice to other homeowners.	3.32	.58	3.16	.65
The presenter was knowledgeable about the subject.[a]	—	—	3.65	.48
The examples used were relevant and meaningful.	3.35	.48	3.38	.55
The pace of the program was appropriate.	3.38	.55	3.22	.63
The information presented was relevant to my geographic location.	3.22	.53	3.43	.56
The information was presented in a logical, easy to follow manner.	3.39	.55	3.24	.60
The course materials were easy to navigate.[b]	3.27	.80	—	—

Note. Scores were calculated using a four-point scale (1 = Strongly Disagree, 4 = Strongly Agree). [a]Statement was relevant only to the workshop presentation. [b]Statement was relevant only to the CD-based materials.

Individual components of the CD-based materials were evaluated for their usefulness. Participants rated the usefulness of the different CD components (Table 5). Overall, participants were pleased with the components used in the CD materials. Text on screen, static graphics, and links to outside information sources received the most useful ratings. Components receiving the lowest ratings were audio and video clips.

Table 5
Evaluation of Components Used in CD-Based Materials (n = 36)

Component	*M*	*SD*
Text on screen	3.34	.59
Static graphics	3.28	.62
Links to outside information sources	3.26	.66
Handouts (i.e. Adobe Acrobat files)	3.11	.62
Video clips	2.69	.72
Audio clips	2.26	.86

Note. Items were measured on a four-point scale (1 = Not Useful, 4 = Very Useful).

Individuals also were asked their preference for future Master Gardener training programs. An overwhelming majority (78%) of the workshop participants indicated they preferred face-to-face instructional formats. Approximately one-half of the CD-based participants indicated they would prefer to have face-to-face trainings, while a large group (38%) indicated that a combination of training methods would be preferred (Table 6).

Table 6
Respondents' Instructional Format Preference (N = 87)

	CD (*n* = 37)		Workshop (*n* = 50)	
Training Method	*f*	Percent	*f*	Percent
Face to face	19	51.4	41	77.4
CD-based	2	5.4	3	5.7
Internet based	2	5.4	2	3.8
Other[a]	14	37.8	4	7.5

Note. [a]The majority of responses indicated a combination of methods was preferred.

A final question regarding overall course satisfaction was asked to all participants. Participants rated their satisfaction using a four-point scale (1 = Very Unsatisfied…4 = Very Satisfied). The CD participants were satisfied (M = 3.38, SD =.72) with their overall experience, while the workshop participants were more satisfied (M = 3.52, SD =.81) with their experience than were the CD participants. Overall, both groups were satisfied with their instruction.

Conclusions

CD-based materials were more effective in promoting understanding of nutrient, water, and pest management turfgrass topics to Master Gardener trainees than were the face-to-face workshop settings. The results indicated that CD-based materials could be used to teach extension clientele difficult subject matter. These results contradict previous research (Branson & Davis, 1985; Sunnarborg, Bradley, & Haynes, 1988; Swistock, Sharpe, and Dickison, 2001;

Rost and VanDerZanden, 2002) that found no differences in learning based on instructional format. Possible explanations exist in that CD-based participants in the current study had greater computer literacy skills, less computer technology anxiety, or were much more attuned to the instructional materials. As such, additional study is needed to isolate these factors in the learning environment.

Several conclusions can be drawn about participants' satisfaction with the instructional materials. First, participants were satisfied with both training methods used in study, which concurs with Staats (1995) who found student satisfaction with distance-based instructional materials was high. Second, the components used in the CD-based materials revealed audio and video clips as not particularly useful. The most useful items were text and static graphics. For this particular course, audio and video clips were not seen as key to students' success. Finally, individuals in the face-to-face setting indicated a preference for future face-to-face training programs. Participants using the CD-based materials showed a preference for face-to-face workshops, yet also indicated they would like to see a combination of instructional formats used in the future. This finding is concurrent with Warmund and Schrock's (1999) previous Master Gardener research.

Recommendations

Implications of this study could impact significantly extension programming and education in general. While some programs use Internet-based training (Rost & VanDerZanden, 2002), extension professionals should consider CD-based training materials as a viable option for an instructional delivery method. CD-based materials offer students with computers, but without Internet access, contact to programs that might not otherwise be available. The same recommendation can be made for education professionals. Programs have gone from traditional classroom to Web-based instructional formats without exploring technologies that lie somewhere in between these two formats.

It is recommended that research be conducted to test the effect of instructional formats on long term retention. Additionally, a future study should be conducted to compare learning between Master Gardeners who are taught in face-to-face workshops versus those taught using CD-based materials using the complete *Turf for Texans* curriculum.

Extension professionals should consider using CD-based materials for program delivery. Extension educators should be cognizant, however, that clientele were satisfied with CD-based materials, but also would like to see a continued human presence. It is recommended that CD-based materials be used as core training materials with follow-up question and answer sessions, if warranted by participants.

Participants in this study were asked to evaluate both the workshop and the CD-based instructional formats. It is possible that participants compared the materials rather than evaluated each format on its own merits; caution is warranted in generalizing this possibility beyond the sample group. A future study should be conducted to evaluate the *Turf for Texans* CD-based curriculum as a single instructional format.

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EFFECTS OF INVESTIGATIVE LABORATORY INSTRUCTION ON CONTENT KNOWLEDGE AND SCIENCE PROCESS SKILL ACHIEVEMENT ACROSS LEARNING STYLES

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Abstract

The purpose of this study was to determine the effect of investigative laboratory integration on student content knowledge and science process skill achievement across learning styles. Treatment groups utilized one of three levels of treatment: subject matter approach without laboratory experimentation, subject matter approach with prescriptive laboratory experimentation, and subject matter approach with investigative laboratory experimentation. A nonequivalent control group quasi-experimental design was used. A purposively selected sample based upon the ability of the teacher to effectively deliver the treatments was selected from the population of students enrolled in an introductory agriscience course. Using regression analyses it was determined that learning style, teaching method, ethnicity, content knowledge pretest scores, and science process skill pretest scores accounted for 33% of the variance in content knowledge gain score. Learning style, gender, teaching method, science process skill pretest scores, and content knowledge pretest scores accounted for 36% of the variance in science process skill gain score. Students taught using the subject matter approach or the investigative laboratory approach were reported as having higher content knowledge and science process skill gain scores than students taught using the prescriptive laboratory approach.

Introduction

The idea that teaching is both an art and a science has become increasingly accepted by those in the education profession (Berliner, 1987). The practitioner of this somewhat paradoxical approach requires both preparation and practice to become a master at this craft. Within the field of agricultural education, an additional and somewhat contradictory dialogue is occurring. This discussion attempts to answer the question, “Is agricultural education vocational or academic?”

The answer to this question may be that agricultural education is both – vocational and academic. In its 1988 report, the National Research Council (NRC) called for curricular expansion in agricultural education, with greater inclusion of scientific subject matter into the traditional production agriculture curriculum. Whereas this expansion was not a call to completely abandon its vocational past, it was a call for the “teaching of science through agriculture” (p. 5).

The scientific literacy needs of individuals entering careers in agriculture are becoming increasingly important. Employees in today’s job market need to know how to learn, reason, think creatively, make decisions, and solve problems. Both science and agriscience education can contribute in an essential way to the development of these skills (National Academy of Science [NAS], 1996). Likewise, with the need for inclusion of science-based concepts into the agricultural education curriculum, new methods for teaching these materials need to be investigated. Science education literature tells us that shifting to an emphasis on active science learning requires a shift away from traditional teaching methods (NAS, 1996).

Theoretical/Conceptual Framework

Mitzel (1960) proposed that teaching effectiveness criteria could be classified according to goal-proximity criteria. The model proposed by Mitzel (Dunkin & Biddle, 1974) laid the foundation for evaluating teaching effectiveness and provided the theoretical framework for this study. Building upon the teaching effectiveness criteria suggested by Mitzel, the model identifies variables that affect the teaching-learning process and categorizes them into four groups: context variables, presage variables, process variables, and product variables. Context variables are those conditions to which the teacher must adjust. Context variables in this study are formative experiences (age, gender, socioeconomic status, etc.), student characteristics (ability, knowledge, attitudes, etc.), school and community characteristics (ethnic makeup, school size, climate, bussing, etc.), and classroom variables (class size, textbooks, technology, etc.).

Presage variables are those characteristics of teachers that may affect the teaching and learning process, such as personal formative experiences, teacher training experiences, etc. Process variables are those activities that influence classroom teaching. They may consist of the classroom actions by both the teacher and the pupil. The final category, product variables, represents the outcomes of teaching and can be grouped into two categories: immediate pupil growth and long-term pupil effects.

According to Bransford, Brown, and Cocking (2000), a major goal of teaching is to prepare students to be able to adapt knowledge to various problems and settings – and using multiple contexts. One of the most effective techniques employed by science and agriculture teachers is the use of laboratory activities. However, laboratory activities, as they are currently used, often fail to engage students in a "mental struggle," as suggested by Clough (2002). According to Clough, laboratory experiences need to be more than just an activity with a pre-determined outcome. They need to be true experiments, and not cookbook activities that stifle student thinking (American Association for the Advancement of Science [AAAS], 1993).

A review of research produced mixed results in the use of teaching science principles in an agricultural context, or in teaching methods that involve active learning strategies. Roegge and Russell (1990) reported significantly higher scores in applied biology and overall achievement by students who incorporated biological principles into agricultural instruction. Chiasson and Burnett (2001) found that agriscience students tended to earn higher scores than non-agriscience students. Mabie and Baker (1996) reported that participation in agriculturally-oriented experiential activities positively impacts the development of science process skills. Downing, Filer, and Chamberlain (1997) found a moderately positive correlation between the preservice teachers' competency levels of science process skill and attitudes toward science. Osborne (2000) reported very low science process skill scores, but higher science process skills and achievement scores for students who participated in prescriptive laboratories. Osborne recommended that a study similar to this be completed and that the effects of learning style be investigated.

Not all studies, however, reported positive results when using science related instruction. Burchfield and Gifford (1995) found no differences between the mean gain in science process skills between the students instructed with traditional instruction or those receiving computer-assisted instruction. Germann (1989) reported that the use of a directed-inquiry approach had no significant effect on the learning of science process skills or on cognitive development.

Little is known about the influence of learning styles on how students respond to laboratory activities. However, much of the reported learning styles research confirms that students enrolled in agriculture courses and/or colleges tend to be field-independent learners (Cano 1999; Cano & Garton, 1994; Marrison & Frick, 1994; Torres & Cano, 1995; Whittington & Raven, 1995). It is this type of learner that often excels in science.

A review of research likewise produced few studies that addressed the effect of investigative activity integration on student content knowledge achievement or science process skill development. Some studies were found that examined the training received by agriscience teachers to prepare them to integrate scientific concepts (Johnson, 1996; Thompson, 1998; Thompson & Balschweid, 2000). However, the majority of studies in this area have examined only teacher attitudes and perceptions toward science integration (Balschweid & Thompson, 1999; Connors & Elliot, 1994; Layfield, Minor, & Waldvogel, 2001; Newman & Johnson, 1993; Thompson & Balschweid, 1999; Welton, Harbstreit, & Borchers, 1994).

Research attempting to identify the most effective teaching methods to be used by teachers for science-based agriculture lessons has been, at best, inconclusive. Moreover, most research dealing with student content knowledge achievement in agricultural education has relied on descriptive and causal-comparative methods (Edwards, 2003). Slavin (2003) stated that more studies utilizing experimental designs are needed in this area.

This study sought to determine if integrating investigative laboratories in a manner that would encourage students to engage at a higher cognitive level, would significantly affect content knowledge achievement and science process skill proficiency level. If so, findings from this study could be utilized by agriculture teachers in middle and high school settings, as well as by teacher educators at colleges and universities.

Purpose and Objectives

The primary purpose of this study was to determine the effect of investigative laboratory integration on student content knowledge achievement and science process skill development across different learning styles. The following objectives guided this study.

1. Describe the learning styles and other demographic characteristics of participants in this study.
2. Describe the variance in content knowledge gain score attributed to learning styles and other demographic characteristics.
3. Describe the variance in science process skill gain score attributed to learning styles and other demographic characteristics.

For the purpose of statistical analysis, objectives were posed as null hypotheses. All hypotheses were tested at the .05 level of significance. The following null hypotheses were tested:

HO_1: There is no difference in the content knowledge gain scores of agricultural education students taught using the subject matter, prescriptive laboratory, or investigative laboratory approaches.
HO_2: There is no difference in the science process skill gain scores of agricultural education students taught using the subject matter, prescriptive laboratory, or investigative laboratory approach.
HO_3: There is no difference in the content knowledge gain scores of agricultural education students of various learning styles.
HO_4: There is no difference in the science process skill gain scores of agricultural education students of various learning styles.
HO_5: There is no difference in the content knowledge gain scores of agricultural education students of varying learning styles taught using the subject matter, prescriptive laboratory, or investigative laboratory approach.
HO_6: There is no difference in the science process skill gain scores of agricultural education students of varying learning styles taught using the subject matter, prescriptive laboratory, or investigative laboratory approach.

Procedures

This study utilized a quasi-experimental design. Since random assignment of subjects to treatment groups was not possible. Intact groups were used and treatments were randomly assigned to groups. The three treatments used were: (1) subject matter instruction only with no laboratory activities, (2) instruction with prescribed laboratory activities in which activities are conceived and orchestrated by the instructor, and (3) instruction accompanied by investigative laboratories in which the student designs and conducts the laboratory experience. The study followed a variation of the nonequivalent control group design (Campbell & Stanley, 1963). Gall, Borg, and Gall (1996) state that the only essential features of this design are nonrandom assignment of subjects to groups and administration of a pretest and posttest to all groups.

The population for this study was students enrolled in an introductory agriscience course. A purposively selected sample based upon the ability of the teacher to effectively deliver the three teaching approach treatments was selected from the population. Each teacher was randomly assigned one of the three treatments. Ten schools within a state were selected to participate in this study. A total of 501 students were enrolled in classes in the selected schools. Of these, 352 students received treatment that could be documented. No data were received from one participating school, and one teacher was determined to not have fully delivered the treatment. Students in these classes were removed from the study.

Professional development in the form of personal and videotaped instructions and demonstrations was provided for each teacher. All materials needed by the teacher to deliver the treatment (lesson plans [plant germination and plant functions], handouts, assessment instruments, etc.) were provided by the researcher. The subject matter to be taught remained the same among all three sets of instructional plans. The instructional plans were evaluated for content validity by a panel of experts from the state's land grant university. Furthermore, teachers audio recorded each lesson in which the treatment was delivered. Audio tapes were analyzed to determine if the appropriate treatment was delivered.

Parallel instruments were developed to collect pretest and posttest content knowledge achievement data. Response rates of 70.7% and 62.5%, respectively, were secured. Validity was established through review by an expert panel of college of agriculture faculty. Instruments were field tested using students not included in the study. Reliability was calculated using the Kuder-Richardson 20 formula, with a reported reliability coefficient of .92.

The Test of Integrated Process Skill (TIPS), developed by Dillashaw and Okey (1980), was used to assess the science process skill ability of students pre- and post-treatment. Parallel forms of this instrument were used to collect the data. A reliability of .72 was calculated KR-20. Response rates for pre- and post-treatment TIPS administration were 79.8% and 50.9%, respectively.

The Group Embedded Figures Test (Witkin, Moore, Goodenough, & Cox, 1971) was used to assess the student learning style. Usable data were collected with a response rate of 81.0%. Data concerning the variables of student ethnicity, gender, and other demographic information were reported to the researcher by the school's student services department from student records.

Findings

The first objective sought to describe the purposively selected sample of this study. A majority (62.7%) of students involved in this study were in the ninth grade, followed by the tenth grade (19.9%), eleventh grade (12.1%), and twelfth grade (5.3%). The majority of students in the study were male (66.5%) and "White, non-Hispanic" (56.0%), followed by "Hispanic" (34.5%), "Black" (7.9%) and "Other" (1.6%). The mean Group Embedded Figures Test (GEFT) score for respondents of this study was 7.6. A majority of students (60.7%) were categorized as field-dependent in their learning style. Field-independent learners constituted the second largest group (23.2%) followed by field-neutral learners (16.1%).

Student content knowledge achievement was determined using the researcher developed content knowledge achievement pretest and posttest instruments. The maximum possible score on these parallel instruments was 50. The pretest mean was 16.39 (SD = 5.04), followed by a posttest mean of 20.59 (SD = 6.79). (See Table 1.) The mean content knowledge gain score was 3.93 (SD = 6.15).

Students' science process skill levels were determined using the TIPS instrument. The maximum score of this instrument is 36. The pretest mean was 15.57 (SD = 5.66) across all students. A posttest mean of 15.81 (SD = 6.66) was reported across all respondents. The mean content knowledge gain score was -0.17 (SD = 6.33).

Table 1
Instrument Scores by Treatment Group (n = 352)

	Treatment Group							
	SM		PL		IL		Total	
Instrument	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Content Knowledge Pretest	18.09	5.07	15.98	4.93	15.47	4.86	16.39	5.04
Content Knowledge Posttest	24.63	5.93	18.30	6.00	20.53	7.16	20.59	6.79
Science Process Skills Pretest	16.17	5.38	16.39	5.58	14.01	5.73	15.57	5.66
Science Process Skills Posttest	18.62	6.17	14.34	6.66	15.59	6.07	15.81	6.66
Content Knowledge Gain Score[a]	6.27	4.84	1.72	6.36	5.04	5.89	3.93	6.15
Science Process Skill Gain Score[a]	2.02	5.19	-2.50	6.20	3.20	5.80	-0.17	6.33

Note. SM = Subject Matter; PL = Prescriptive Laboratory; IL = Investigative Laboratory
[a] Gain score = Posttest score minus pretest score

The second objective sought to describe the variance in content knowledge gain score attributed to leaning styles, ethnicity, and other demographic characteristics. A backward regression procedure produced a model consisting of field-dependent learning style (t = -2.35, p = .02), subject matter treatment group (t = 2.40, p = .02), prescriptive laboratory treatment group (t = -3.86, p <.001), ethnicity (t = 2.27, p = .02), science process skill pretest score (t = 5.07, p <.001), and content knowledge pretest score (t = -7.77, p <.001). This model accounted for 33% of the variance in content knowledge gain score (see Table 2).

Table 2
Backward Regression Analysis to Predict Content Knowledge Gain Scores (n = 352)

Variable	*B*	*SE*	β	*t*	*p*
Constant	9.42	2.04		4.62	<.001
Learning Style[a]	-2.25	.96	-.15	-2.35	.02
Treatment Group					
Subject Matter[b]	2.45	1.02	.18	2.34	.02
Prescriptive Laboratory[b]	-3.63	.94	-.29	-3.86	<.001
Ethnicity[c]	2.14	.94	.14	2.27	.02
Science Process Skill Pretest	.41	.08	.35	5.07	<.001
Content Knowledge Pretest	-.67	.09	-.54	-7.77	<.001

Note. $F_{(190)}$ = 16.71, p <.001; R^2 = .35; Adjusted R^2 = .33
[a] Coded as 1 = field-dependent; 0 = field-independent; [b] Coded as 1 = member of group; 0 = not a member of group; [c] Coded as 1 = white, non-Hispanic; 0 = minority

Objective three sought to describe the variance in science process skill gain score attributed to leaning styles, ethnicity, and other demographic characteristics. A backward regression model consisting of field-dependent learning style (t = -3.01, p = .003), prescriptive laboratory group membership (t = -5.30, p <.001), gender (t = -2.52, p = .01), science process skill pretest score (t = -6.51, p <.001), and content knowledge pretest score (t = 2.38, p =.02) was identified and accounted for 36% of the variance in science process skill gain score (see Table 3).

Table 3
Backward Regression Analysis to Predict Science Process Skill Gain Scores (n = 352)

Variable	*B*	*SE*	β	*t*	*p*
Constant	11.20	2.34		5.00	<.001
Learning Style[a]	-3.11	1.03	-.21	-3.01	.003
Treatment Group					
Prescriptive Laboratory[b]	-4.42	.83	-.35	-5.30	<.001
Science Process Skill Pretest	-.58	.09	-.49	-6.51	<.001
Content Knowledge Pretest	.22	.09	.18	2.38	.02
Gender[c]	-2.18	.87	-.16	-2.52	.01

Note: $F_{(157)} = 18.39$, $p < .001$; $R^2 = .38$; Adjusted $R^2 = .36$
[a] Coded as 1 = field-dependent; 0 = field-independent; [b] Coded as 1 = member of group; 0 = not a member of group; [c] Coded as 1 = male; 0 = female

The first two null hypotheses of no difference in content knowledge gain scores and no difference in science process skill gain scores among the subject matter, prescriptive laboratory, or investigative laboratory treatment groups were tested using a MANCOVA procedure. Hotelling's Trace statistic for group effects on the dependent variables was .12, $F_{(4, 154)} = 2.34$, $p = .05$, with an effect size of .06 and power level of .67. Follow up univariate analyses of covariance revealed significant differences between treatment groups in both content knowledge gain scores and science process skill gain scores. Therefore, both null hypotheses were rejected.

Null hypotheses three and four stating that no differences existed in either the content knowledge gain scores or the science process skill gain scores across learning styles was also tested using the MANCOVA procedure. Hotelling's Trace statistic for learning style effects on the dependent variables was .18, $F_{(4, 154)} = 3.37$, $p = .01$. The effect size was .08 and the power was .84. Follow up univariate analysis of covariance failed to reveal significant differences across learning styles for either content knowledge gain scores or science process skill gain scores. The two null hypothesis failed to be rejected.

Null hypothesis five and six respectively stated that no differences existed in either the content knowledge gain scores or the science process skill gain scores across the learning styles of students taught using the subject matter, prescriptive laboratory, or investigative laboratory approach. Both hypotheses were tested using the MANCOVA procedure which produced a Hotelling's Trace statistic of .07, $F_{(8, 154)} = .65$, $p = .73$. The power was calculated at .29, with an effect size of .03. Since the multivariate analysis of covariance failed to reveal significant differences, the null hypotheses failed to be rejected.

Conclusions / Implications / Recommendations

Participants in this study were predominantly white, male, and enrolled in the ninth grade. The majority of students were field-dependent in their learning style. It was expected that the majority of participants in this study would be in the ninth grade. Since the population for this study was students enrolled in an introductory agriscience course. The finding that approximately 17% of the students in the study were upperclassmen (11th and 12th graders) was somewhat surprising due to the introductory nature of the course. However, since this course counts as a science credit toward graduation, these upperclassmen may be enrolling in this course for that reason. If so, this might indicate that upperclassmen taking this course are not in a college preparatory curriculum, since those students would likely have completed their introductory science requirements by this time. Another possible explanation may be that these students are only looking for what they perceive to be a less difficult science credit course. Other possible explanations could be that due to more strict graduation requirement or possibly school overcrowding, these upperclassmen were not able to enroll in this introductory course at an earlier date. Further research is needed to understand the motivation of students enrolling in this type of agricultural education course.

Overall, posttest scores for students involved in the study were very low. Further investigation is needed to address why students achieved so poorly. It is of concern when a great deal of time is spent in teaching a unit of instruction and the result is a small amount of knowledge gain. The finding that students with less prior knowledge in the content area had higher content knowledge gain scores at the conclusion of instruction is contradictory to the findings of Roberts (2003). However, students with greater science process skill achievement prior to instruction showed higher content knowledge gain.

Gender did not contribute significantly to explaining the variance in content knowledge achievement. However, learning style was found to play a role in knowledge gain. Students with a field-independent learning style were predicted to have more than double the content knowledge gain as compared to field-dependent learners when all other variables are controlled. Previous research regarding the influence of learning styles on achievement was inconclusive. These findings, however, are inconsistent with the studies that reported no difference in gain scores based on learning styles (Day, Raven, & Newman, 1998; Freeman, 1995; Roberts, 2003; Shih & Gamon, 2001).

The regression equation predicted that white, non-Hispanic students would have content knowledge gain scores 2.14 times greater than that of minority students when all other variables are held constant. Further research is needed to better understand the cause of this gain discrepancy. Of particular interest is the effect of socioeconomic status of students on achievement. Are ethnicity and socioeconomic status coterminous as Abbot and Joirman (2001) suggest? If that is the case, what can educators do to mitigate the effect?

The regression equation predicts that female students are likely to attain 2.18 times the science process gain scores as compared to males, when all other variables are held constant. This contradicts the commonly held belief that females under-perform their male counterparts in science. However, it should be noted that agriculture often attracts females who tend to be field-independent in their learning style and therefore may not represent a normal distribution. Further research should be conducted to explain this large difference in gain between the genders.

The findings of this study suggest that students taught using either the subject matter approach or investigative laboratory approach to teaching had higher content knowledge gain scores than students taught using the prescriptive laboratory treatment level. This finding did not support the research conducted by Osborne (2000) involving similar secondary students.

Whereas it was reported by the teachers involved in this study that the investigative approach took a substantially longer period of time to implement than did the subject matter approach (1900 minutes, as compared to 1410 minutes, respectively), it would follow that most teachers would select the shorter time frame. However, upon investigation as to the level of cognitive ability at which content knowledge was assessed, the vast majority of questions on the assessment instruments addressed only the lower levels of Bloom's Taxonomy (Anderson & Krathwohl, 2001). While this is similar in nature to the questions found on many of the standardized test instruments that are common in today's educational environment, the question remains as to how these teaching approaches affect student understanding at the higher levels of Bloom's Taxonomy. Further research is needed to assess this question. Whereas it is understood that knowledge at the lower levels is needed to form a strong foundation upon which to build, it is equally important to address knowledge and understanding at the higher levels.

The findings of this study suggest that students taught using the investigative laboratory approach or the subject matter approach to teaching had higher science process skill gain scores than students taught using the prescriptive laboratory treatment level. This finding did not support the research conducted by Osborne (2000) or Germann (1989) involving similar secondary students. In light of these conflicting findings, further research into the effect of teaching method on student science process skill development is warranted.

Student learning style was not found to have significant influence on science process skill gain score either alone or in interaction with level of treatment (teaching method). The mean GEFT score was 7.6, indicating that, in general, this group was strongly field-dependent. Dyer (1995) stated that field-dependent learners tend to work better in situations where structure is provided for them, such as in the subject mater and prescriptive laboratory methods. Field-independent learners on the other hand tend to prefer a hypothesis-testing approach to learning and are better able to provide their own structure in learning activities such as in the investigative laboratory approach. Therefore, it stands to reason that field-independent learners would enjoy and perhaps experience more success in classrooms in which the investigative approach was utilized. Further investigation into this phenomenon is suggested.

Whereas the variables addressed in this study were able to describe 33% and 36% of the variance in content knowledge and science process skill gain score, respectively, further research is needed to attempt to understand the unaccounted for variance. Research on the relationship between teaching methods, content knowledge, and science process skill achievement of high school students in agricultural education programs should continue. Other variables of interest are the effect of these teaching methods on student attitude as well as long and short term content knowledge retention. As a clinical study, this study should be replicated using procedures that allow a higher degree of randomization and ultimately more generalizability. As noted by Edwards (2003), the research base in agricultural education is dominated by descriptive type research. More research using experimental methods are needed to assist the profession in advancing in the area of agriscience achievement. Additionally, investigative activity integration focuses on student inquiry as a learning method. The *Standards* (National Academy of Science, 1996) state that inquiry is key to student understanding of science. However, the *Standards* do offer a caution, indicating that conducting hands-on activities does not guarantee inquiry nor are hands-on activities the only way in which students can engage in inquiry. What is key is that inquiry activities are conducted to answer authentic questions generated from student experience.

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EFFECTS OF LECTURE VERSUS EXPERIENTIAL TEACHING METHOD ON COGNITIVE ACHIEVEMENT, RETENTION, AND ATTITUDE AMONG HIGH SCHOOL AGRISCIENCE STUDENTS

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Abstract

The purpose of this study was to compare the experiential teaching method with the lecture teaching method on student cognitive achievement on immediate and delayed posttests, and on student attitude toward the subject matter. Four high school agriscience classes from two schools in two different states were selected to participate. A pretest, posttest control group design with an internal replication was utilized. Two versions of two different researcher developed lesson plans were used. A soil erosion lesson was developed in both experiential and lecture versions, as was a lesson on enzymatic browning of fruit. Students within each class were randomly assigned to two groups. Group A received the hands on teaching method for lesson one while students in group B received the lecture method. For lesson two, the groups were reversed, group A receiving the lecture and group B the hands on method. For the students across the two schools used in this study, the main effect of teaching method did not make a difference in student cognitive achievement, retention, or attitude. However, there was a significant interaction between teaching method and school on three of the four post tests of cognitive achievement and retention. This indicates that no single teaching method is likely to be more effective in all classes or with all subject matter areas. This argues for careful selection and use of a variety of teaching methods. Professional educators must select appropriate teaching methods based on their own unique knowledge of their students and subject matter, and specific classroom situation.

Introduction

Agricultural education in the public schools has persevered through years of social and technological change. Curriculum and teaching methods in agricultural education have mirrored these changes. Prior to the Smith-Hughes Act, agricultural education focused on scientific principles underlying agriculture and the application of experimental sciences such as chemistry and physics (True, 1929).

In the early 1900s the industrial revolution brought about social changes and technological advancements (Kliebard, 1995). To reflect this change, the social efficiency movement in education favored training students for a vocation by tracking them according to their socioeconomic status (Camp, 1982). The Smith-Hughes Act reflected many of these philosophies from the social efficiency proponents. The movement brought about changes in the agriculture classroom. Thus, many of the hands-on activities utilized in the classroom today foster the development of procedural and psychomotor skills as they relate to traditional agricultural occupations, instead of technical and scientific principles as agricultural education did originally (Johnson, Wardlow, & Franklin, 1997).

The trend in agricultural education curriculum once again reverted back to scientific experimentation in the 1980s. Advances in the agricultural sciences called for incorporating more scientific content, agribusiness, horticulture, landscaping, and natural resources into the agriculture curriculum (National Research Council, 1988). To parallel this, most teacher education programs now stress applied learning of the agricultural sciences and technologies (National Research Council, 1988).

Theoretical Framework

The call for teaching agriculture to include experimentation of scientific concepts requires teaching methods that support hands-on activities. One such method is the experiential teaching method. This method is also referred to as the hands-on or problem-based teaching method. Historically, it is among the oldest of teaching methods and, because of this, is sometimes viewed as outdated (Hendricks, 1994). To counter this, proponents often turn to the experiential learning theory to support their advocacy of this method.

Mezirow (1994) and Freire (1970) asserted that experience and how it is critically reflected upon is the core of all learning. This assertion refutes the sole reliance upon lecture-based methods for instruction of agricultural sciences and technologies. David Kolb (1984), often credited with developing contemporary experiential learning theory, also added the stages of abstract conceptualization and active experimentation to Mezirow and Freire's theory.

Borzak (1981) reported that active experimentation allows students to take an active role in what is being learned and to take ownership of their education -- solving problems on their own. Additionally, Rogers and Frieberg (1994) indicated that self-initiated learning is the most lasting and pervasive, with "lasting" presumably referring to knowledge retention. Logic follows that teaching with experiential methods is conducive to knowledge retention. Students are more likely to remember what they did rather than what they heard or read. To further support this, a University of Oregon study found that students retain information better if they physically connect with the material and are more physically active in the classroom (Hancock & Wingert, 1996).

Another argument to support the use of the experiential teaching method is that it elevates students' cognition levels. Problem-based teaching approaches develop students' critical thinking abilities and therefore elevate the learner to a higher cognition level (Ngeow & Kong, 2001). The increased use of critical-thinking skills enhances a student's ability to obtain, retain, and retrieve knowledge (Halpern, 2003). Thus, experiential teaching may increase cognitive achievement and retention.

Previous studies comparing experiential teaching methods and lecture-based teaching methods have produced mixed results. A study conducted in Illinois agriculture programs found an increase in knowledge retention using a problem-solving method (Flowers & Osborne, 1988). However, a similar study reported that students instructed with the lecture method scored significantly higher than students instructed with a problem-based teaching method (Sundblad, Sigrell, Knutsson, & Lindkvist, 2002). A different study found no differences in student cognitive achievement on either immediate or delayed posttests, but did find that students who engaged in hands-on activities had significantly more positive attitudes toward the subject matter (Johnson, Wardlow, & Franklin, 1997). These mixed results indicate a need to further compare teaching methods to determine the effectiveness of the experiential teaching method versus the lecture method.

The literature is inconclusive regarding the effectiveness of the experiential teaching method on cognitive achievement compared with the lecture method. However, the literature does indicate that the experiential teaching method promotes a positive attitude toward the subject matter. In order to evaluate the two teaching methods in question, this study compared them in high school agriscience classrooms.

Purpose and Hypotheses

The purpose of this study was to compare the experiential teaching method with the lecture teaching method on student cognitive achievement on immediate and delayed posttests, and student attitude toward the subject matter. The following null hypotheses were developed and tested at the .10 alpha level:

H_{o1}: There will be no significant differences in scores on either immediate or delayed posttests of cognitive achievement by school, teaching method, or the interaction of school and teaching method between students who have been taught a lesson on soil erosion using the experiential method of teaching and students who have been taught using the lecture method of teaching.

H_{o2}: There will be no significant differences in attitude toward soil erosion by school, teaching method, or the interaction of school and teaching method between students who have been taught a lesson on soil erosion using the experiential method of teaching and students who have been taught using the lecture method of teaching.

H_{o3}: There will be no significant differences in scores on either immediate or delayed posttests of cognitive achievement by school, teaching method, or the interaction of school and teaching method between students who have been taught a lesson on enzymatic browning using the experiential method of teaching and students who have been taught using the lecture method of teaching.

H_{o4}: There will be no significant differences in attitude toward enzymatic browning by school, teaching method, or the interaction of school and teaching method between students who have been taught a lesson on soil erosion using the experiential method of teaching and students who have been taught using the lecture method of teaching.

Procedures

This study compared two instructional methods commonly used in agriscience and technology education on student cognitive achievement and student attitude toward the subject matter. Two versions of two different lesson plans were developed by the researcher: soil erosion and enzymatic browning of fruit. One version of each lesson plan utilized the lecture method of teaching while a second version of each plan utilized an experiential method of teaching. The technical content for each lesson plan, across both the lecture and experiential teaching methods, was based on the same educational objectives.

The target population for this study included all students enrolled in a high school introductory agriscience course within a 100-mile radius of Fayetteville, Arkansas. The accessible population was further limited. Only schools with at least two sections of the introductory course were considered for the study. In addition, because the pretest, instruction, and immediate posttest needed to be administered within a complete class period, only schools on 90-minute block scheduling were considered. Four classes from two schools in two different states were selected to participate. Since this was a convenience sample, results of this study may be limited to these schools.

A pretest, posttest control group design with internal replication was utilized for this experiment. According to Shutt (2001), randomization in such a design assumes equivalence of groups. Campbell and Stanley (1963) assert this design controls for all threats to internal validity. The design was slightly modified for this study by adding a delayed posttest and an internal replication.

All lesson plans and instruments related to the lesson plans were researcher developed. The researcher-made tests were based on the instructional objectives for each lesson. Pre-tests, immediate post-tests, and delayed post-tests for each of the different technical subjects served as the instruments for the study. These included both questions that required recall of knowledge and questions that utilized a performance-based assessment. These three tests were equivalent (testing over the same objectives for each lesson), but slightly revised from one another.

The pretest for both soil erosion and enzymatic browning consisted of ten multiple-choice items with four response choices, including an “I don’t know” response to control for random guessing. The immediate posttest for the soil erosion lesson consisted of fifteen multiple-choice items that required students to recall factual information about soil erosion with five response choices, including an “I don’t know” response choice. The test also contained a mathematical problem to be solved. In addition, students had to compare two stream tables and determine which one displayed characteristics of a higher erosion rate. The delayed posttest had the same format as the immediate posttest, except the ordering of the first fifteen questions differed, different values for the math problem were used, and two different stream tables were compared.

The enzymatic browning immediate posttest had thirteen multiple-choice questions that required the recall of factual information with four response choices, including an “I don’t know” response choice. Students also had a problem-solving section where they had to choose the proper preservative and apply it to a piece of fruit utilizing the correct procedure. The delayed posttest had the same format except the ordering of the first thirteen questions varied and students were given a similar but different problem to solve.

The validity of each of these instruments was established prior to data collection. Face validity of the instruments was determined by comparing the individual questions to the instructional objectives of the lesson. The instrument had to measure each lesson objective. A panel of experts determined the instruments possessed content validity. The attitude instruments were a modified version of the "Attitude Toward Any School Subject Instrument" (Purdue Research Foundation, 1986). The instruments consisted of 5 Likert-type items (1 = strongly disagree; 5 = strongly agree) that measured student attitude toward soil erosion and enzymatic browning. Higher scores on the summated scale represented a more positive attitude.

A pilot test was conducted at a school similar to those in the main experiment to test the lesson plans and instruments. Selection for the pilot test school had the same two criteria that the selection for the schools in the study had: 1) have at least two sections of the introductory agriscience course and 2) class is conducted in 90-minute blocks.

Minor editing to improve clarity of the instruments was done based on the results of the pilot test. Cronbach's alpha and KR-20 was used to establish the reliability of the instruments. The KR-20 reliability estimates for the soil erosion pretest, immediate posttest, and delayed posttest were .62, .60, and .63 respectively. The reliability estimates for the enzymatic browning pretest, immediate posttest, and delayed posttest were .55, .73, and .64 respectively. Cronbach's alpha reliability estimate for the soil erosion attitude survey was .93 and the estimate for the enzymatic browning attitude survey was .94.

Students in the main experiment were randomly assigned to either the control group or treatment group by using the Researcher Randomizer (www.randomizer.org, 2003). Students in the control group received the soil erosion lesson via the lecture teaching method, while the treatment group received the soil erosion lecture via the experiential teaching method. For the enzymatic browning lesson, the original control group served as the treatment group, while the original treatment group served as the control group.

For both lessons taught, students were given a pretest to determine prior knowledge and establish equivalence of groups. To control for the potential effect of having different teachers, the researcher taught all lessons. Upon completion of instruction, students were administered an immediate posttest to measure cognitive achievement. Two class periods following the instruction, meaning 4-6 days on block scheduling depending if a weekend fell in between class periods, a delayed posttest was administered to measure cognitive achievement for knowledge retention. Students completed the attitude surveys upon completion of their respective delayed posttests.

Findings

To analyze the results of the two pretests, 2 x 2 factorial ANOVAs were used. There were no significant differences in student's prior knowledge of soil erosion by school, F (1, 68) = 0.01, $p > .10$; by the teaching method group to which they were assigned, F (1, 68) = 0.68, $p > .10$; or by the interaction of school and teaching method group, F (1, 68) = 2.77, $p > .10$. In addition, there were no significant differences in student's prior knowledge of enzymatic browning by school, F (1, 72) = .039, $p > .10$; by teaching method group, F (1, 72) = 1.77, $p > .10$; or by the interaction of school and method group, F (1, 72) = 1.66, $p > .10$.

A 2 x 2 factorial MANOVA was utilized to test the first null hypothesis, differences in cognitive achievement on the soil erosion lessons (Table 1). The results indicated no significant difference for the main effect of school, Wilks' Lamda = 0.95, F (2, 68) = 1.67; $p > .10$; and no significant difference for the main effect of teaching method, Wilks' Lamda = 0.95, F (2, 68) = 1.67; $p > .10$. However, there was a significant interaction between school and teaching method, Wilks' Lamda = 0.70, F (2, 68) = 14.37, $p < .10$. The results of the MANOVA revealed the interaction occurred at both school A and B. As a result, the null hypothesis was rejected.

Table 1.
Summary of Results for Soil Erosion and Enzymatic Browning Experiments

		Factors		
Experiment	Dependent Variable	School (A or B)	Method (Hands-on vs. Lecture)	School by Method (Interaction)
Soil Erosion	Immediate post test	Not significant	Not significant	Significant School A: hands on > lecture School B: lecture > hands on
	Delayed post test	Not significant	Not significant	Significant School A: hands on > lecture School B: lecture > hands on
	Attitude	Significant B >A	Not significant	Not significant
Enzymatic Browning	Immediate post test	Not significant	Not significant	Significant School A: lecture > hands on School B: hands on > lecture
	Delayed post test	Significant A > B	Not significant	Significant School A: lecture > hands on
	Attitude	Not significant	Not significant	Not significant

To further analyze the interaction between school and teaching method, one-way ANOVAs on the immediate posttest and delayed posttest were used to determine the nature of the difference. There were no significant differences on either the immediate or delayed posttests for the main effects of school, F (1, 68) = 0.43, $p > .10$, or teaching method, F (1, 68) = 0.04, $p > .10$. However there was a significant interaction for school by teaching method on the immediate posttest, F (1, 68) = 25.61, $p < .10$, and the delayed posttest, F (1, 68) = 20.55, $p < .10$.

The LS Means procedure was used to compare immediate and delayed posttest scores by teaching method in each school. Within schools, students in school A receiving the experiential teaching method performed higher than the students receiving the lecture-method on the immediate, $F(1, 71) = 15.56$, $p < .10$, and delayed posttests, $F(1, 71) = 9.58$, $p < .10$. In school B, students receiving the lecture-method performed higher than the students receiving the experiential method on both the immediate, $F(1, 71) = 10.59$, $p < .10$, and delayed, $F(1, 71) = 10.98$, $p < .10$, posttests.

A 2 x 2 factorial ANOVA was used to test the second null hypothesis, attitude toward the subject matter for the soil erosion lessons. The results revealed a significant main effect for school, $F(1, 45) = 3.00$, $p < .10$. No difference in attitude by teaching method was found, $F(1, 45) = 2.19$, $p > .10$, nor was there a significant interaction between school and teaching method, $F(1, 45) = 0.14$, $p > .10$. The means and standard deviations indicated students at school B had a more positive attitude toward the subject matter, soil erosion.

Null hypothesis three, difference in cognitive achievement on the enzymatic browning lessons, was tested with a 2 x 2 factorial MANOVA. The results indicated there was no significant difference for the main effect of teaching method, Wilks' Lamda = 0.97, $F(2, 71) = 0.94$, $p > .10$. However, there was a significant difference for the main effect of school, Wilks' Lamda = 0.90, $F(2, 71) = 3.93$, $p < .10$. Also, there was a significant interaction between school and teaching method, Wilks' Lamda = 0.90, $F(2, 71) = 4.00$, $p < .10$. Due to these results, null hypothesis three was rejected. The results of the MANOVA also revealed there was a significant multivariate group effect only at school B.

One-way ANOVAs were utilized on both the immediate and delayed posttests to determine the nature of the interaction. The results indicated there were no significant main effects for school, $F(1, 72) = 1.14$, $p > .10$, or for teaching method, $F(1, 72) = 0.30$, $p > .10$ on the immediate posttest. However, there was a significant interaction for school by teaching method, $F(1, 72) = 8.08$, $p < .10$ on the immediate posttest.

The delayed posttest had a significant main effect for school, $F(1, 72) = 5.40$, $p < .10$. The results also revealed a significant interaction for teaching method by school, $F(1, 72) = 6.15$, $p < .10$. However, there was no significant main effect for teaching method, $F(1, 72) = 0.06$, $p > .10$.

The LS Means procedure was used to compare immediate and delayed posttest scores by teaching method in each school. Students in school A scored significantly higher than students in school B on the delayed posttest. Within each school, students receiving the lecture teaching method in school A performed significantly higher on the immediate, $F(1, 72) = 3.03$, $p < .10$, and delayed posttests, $F(1, 72) = 4.23$, $p < .10$ than the students receiving the hands-on teaching method. In school B, students receiving the hands-on teaching method performed higher than the students receiving the lecture teaching method on the immediate posttest $F(1, 72) = 5.09$, $p < .10$, yet did not score differently on the delayed posttest $F = (1, 72) = 2.23$, p > .10.

A 2 x 2 factorial ANOVA was used to test the fourth null hypothesis attitude toward the subject matter for the enzymatic browning lessons. The results indicated no significant difference in attitude by school, $F(1, 56) = 0.36$, $p > .10$. In addition, no difference in attitude by teaching method was found, $F(1, 56) = 1.69$, $p > .10$. Finally, there was no significant interaction between school and teaching method, $F(1, 56) = 0.00$, $p > .10$. The null hypothesis was retained.

Conclusions, Discussion, and Recommendations

For the students across the two schools used in this study, the main effect of teaching method did not make a difference in student cognitive achievement and retention. However, there was a significant interaction between teaching method and school for three of the four post tests of cognitive achievement and retention.

Therefore, these data indicate the lecture and experiential teaching methods affected student achievement differently within each of these two schools. Thus, it could be concluded that the effectiveness of the teaching methods by which students are taught, with regard to student cognitive achievement and retention, differs between schools.

In as much as teaching method appears to make a difference in student achievement, which method is most effective varies within and across schools and subject matter areas. There was no "best" teaching method across groups of students or different subject matter. The individual teachers are in the best position to determine the most effective teaching method for their particular group of students and their unique subject matter. This finding may even extend to groups of students within classes and change from one subject to the next. This makes a case for the use of a wide variety of methods in teaching all subjects.

Students at one school had a significantly more positive attitude for learning about soil erosion than students in the other school, but not based on the method by which they were taught. When investigating the school districts' agricultural base, it was found that this school district has large portions of row crop operations, whereas the other school district is largely pasture land. These students are more likely to have seen the consequences of soil erosion in the community, thus impacting their attitude toward learning about it. Teachers should be aware of the community's and students' interests and needs when implementing courses and developing lessons.

Further research is recommended to extend this study by including more schools, more classrooms, different agriscience classes, and different subject matter to determine if these results are generalizable. The length of any future study should be extended to an entire unit of instruction or even to a semester to determine if long-term use of lecture or experiential teaching method indicates an advantage to either method.

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THE INFLUENCE OF LEARNING STYLE, LEADERSHIP STYLE, AND LEADERSHIP ADAPTABILITY ON CRITICAL THINKING DISPOSITION

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Abstract

The purpose of this study was to determine the influence of learning style, leadership style, and leadership adaptability on students' critical thinking disposition. The sample for this study consisted of 115 undergraduate college of agriculture and life sciences students enrolled at a land grant university. Results showed that students are primarily Concrete Sequential and Abstract Random learners, with preferred leadership styles in the Selling and Participating categories, Low to Moderate leadership adaptability scores, and relatively high critical thinking disposition scores. No differences in leadership style, leadership adaptability, or critical thinking disposition were found between students of different learning styles. Likewise, no differences in critical thinking disposition were noted between students of contrasting leadership styles or on leadership adaptability scores. It was suggested that faculty may need to rethink the structure of leadership delivery methods. By structuring higher-order educational activities that require students to match their leadership style with the situations, students may show an increase in leadership adaptability scores. It was recommended that longitudinal studies be conducted to more accurately assess this phenomenon.

Introduction/Theoretical Framework

Students are much different today than they were three decades ago. While not surprising, educators sometimes take this phenomenon for granted. Whereas educating the masses was once a straightforward understanding that those who know, teach, and those who do not know, learn; the process of teaching and learning seems to have evolved into a more complicated business. Schroeder (1993) reinforced the difference between how students and faculty learn, noting that 60% of entering college freshmen fall into the concrete active pattern in their learning style, whereas more than 75% of faculty members reflect a preferred learning pattern in the abstract reflective realm. This divergence in learning style becomes more complex when other factors such as leadership style, leadership adaptability, and the disposition to think critically are introduced to the mix.

Schafersman (1991) defined critical thinking as true higher order thinking that allows a person to ask appropriate questions in order to gauge a reflective, responsible, and reasonable response to a given situation. He further contended that children are neither born with the ability to think critically, nor do they acquire it naturally as they go through life. Rather, it is a process whereby the skill of thinking critically is one that must be taught and that few ever learn. According to Schroeder (1993), whereas faculty members are generally abstract reflective learners who favor teaching in a style that is thoughtful, introspective, scholarly, and promotes learning for its inherent value, entering college students are generally concrete, active learners who need structure. These students are most effective at learning when useful applications of knowledge are obvious (Schroeder, 1993). Does the potential for conflict increase when these confounding approaches to teaching and learning meet?

While many variables may influence critical thinking ability, several studies have established a relationship between learning style and students' ability to think critically. For example, Torres and Cano (1995b) found that learning style was an important variable for educators to know and understand when promoting and developing students' critical thinking abilities. The researchers reported that nine percent of the variance in the dependent variable was attributed to learning style. Whittington (1998) reported that when faculty interventions were used, improvement in cognitive level discourse in postsecondary students was an outcome. Myers and Dyer (2004) reported a relationship between learning style and critical thinking scores, noting that deeply embedded Abstract Sequential learners exhibited significantly higher critical thinking scores.

An expansive literature base exists that describes individual variables that may influence critical thinking ability. For example, several researchers have studied the learning styles of students (Dyer & Osborne, 1996; Fuller, Norby, Pearce, & Strand, 2000; Garton & Thompson, 1999; Gregorc, 1979, 1982, 1985; Mills, 2002; Myers & Dyer, 2004; Ross, Drysdale, & Schulz, 2001; Schroeder, 1993; Torres & Cano, 1994, 1995a). Others have explored leadership style and adaptability (Birkenholz & Schumacher, 1994; Hersey, Blanchard, & Johnson, 2001; McKinley, Birkenholz, & Stewart, 1993; Moore & Dyer, 2002; Myers & Dyer, 2004; Northouse, 2001; Ricketts, 2003; Ricketts & Rudd, 2004).

Likewise, research on critical thinking disposition has been frequently studied in the past few years, with various levels of disposition being reported (Facione, 1990; Paul, 1995; Ricketts, 2003; Ricketts & Rudd, 2004; Rudd, Baker, & Hoover, 2000; Frisby & Traffanstedt, 2003). However, few studies have been conducted in the field of agricultural education that have explored the relationship between learning style, leadership style, leadership adaptability, and critical thinking disposition *en masse*.

The theoretical framework for this study lies in a compilation of theories about how students learn, how they lead, and how they think. Specifically, Gregorc's (1982) *Mind Styles Delineator* served as the guiding framework for how students learn. In his model Gregorc identifies four basic categories of learners. Those categories are defined based upon how the mind receives, processes, and mediates knowledge in the most efficient and effective manner for a particular learner. The four learning styles identified by Gregorc's model are: Concrete Sequential, Abstract Sequential, Concrete Random, and Abstract Random. According to Gregorc (1985), these styles represent the perception (concretely or abstractly) and ordering, or processing, (sequentially or randomly) of information. Perceiving information in a concrete form allows learners to grasp an idea or concept and utilize their senses to work to a logical conclusion. In this form information can be received through all five senses. Receiving information in an abstract form allows one to visualize concepts that cannot be seen. Again, however, most learners prefer to receive information in only one of the two forms – concrete or abstract (Gregorc, 1979, 1982; Mills, 2002; Ross, Drysdale, & Schulz, 2001).

Gregorc (1979) theorizes that the ordering of information once it has been received is done either randomly or sequentially. The two methods greatly differ in that a sequential learner gathers and systematically organizes thoughts in an orderly and methodical fashion. Conversely, a random learner is predisposed to processing chunks of information in no particular order, and without focus or levels of importance (Gregorc, 1982; Mills, 2002; Ross, Drysdale, & Schulz, 2001).

Can learning styles be altered? While it may be possible to temporarily change an individual's learning style, Torres and Cano (1995b) warn against it. Rather, they contend that the goal of the instructor should be to understand learning style differences and to assist students in identifying resources available to them to best utilize their learning style strengths. Dyer (1995) offered that the most effective instruction may occur when the instructor matches the teaching methods used to the preferred learning styles of the students. Torres and Cano (1994) seemed to support this contention, noting that instructors need to be sensitive to learning style differences.

The second component of the theoretical framework of this study is the *Situational Leadership Model*, as presented by Hersey et al. (2001). According to Northouse (2001), Hersey and Blanchard's Situational Leadership Theory is one of the most widely recognized leadership models. In this model the leader varies his or her actions based upon the given situation. This situational approach includes three key components, which include the characteristics of the leader, the characteristics of the follower, and the characteristics of the situation (Hersey et al., 2001). According to Hershey et al, an individual's leadership style is defined as the behavior pattern exhibited as he or she influences the actions of others. It is determined based upon the combination of task and relationship behaviors (Hersey et al., 2001). Similar to the learning style component of the framework, individuals are likely to gravitate to one of four style categories: Telling, Selling, Participating, or Delegating. These categories are derived from the directive and supportive dimensions needed by leaders to accomplish goals and to address the emotional needs of followers (Hersey et al., 2001).

A secondary component of the *Situational Leadership Model* is the concept of leadership adaptability. Recognizing that individuals have a preferred leadership style, Hersey et al. (2001) noted the degrees to which leaders assess followers' readiness to adapt to various situations. This chameleon-like ability to take temporary leave from a preferred leadership style as a new situation arises is invaluable in successful organizations (Hersey et al. 2001; Northouse, 2001).

The third component of the study's theoretical framework lies in the work of Facione (1990). According to Facione, some people are predisposed to think critically, while others must work more diligently to develop the skill. *The American Philosophical Association's Delphi Research Report* (Facione, 1990) indicated that a student's disposition to think critically is a key element in the educational process. Facione suggested that, while the experts profess that there may not be such a thing as a totally unadulterated critical thinker, pure critical thinking must include both dimensions of skill and disposition. There must be a keen mind, a sense of urgency in the level of inquisitiveness, and a zealous hunger for reliable information in order to be classified as disposed to critical thinking (Facione, 1990). Weak critical thinkers do not seem to possess these attributes. Disposition and skill, as interwoven critical thinking components, were also noted by Paul (1995) and Rudd, Baker, and Hoover (2000).

Frisby and Traffanstedt (2003) echoed the importance of delineating the need for both skill development and more positive attitudes toward critical thinking. The authors noted that instructors do well to keep clear distinctions between the ability to think critically versus the attitudinal disposition to think critically. Falk (1994) noted that calls for change have centered on a need for educational institutions to provide opportunities for students to engage in activities that promote in-depth understanding, critical thinking, creative problem solving, and the ability to use knowledge in real-life settings. According to Frisby and Traffanstedt (2003), it is when this line is sullied that high scores on commercial critical thinking tests may be misinterpreted to indicate that the learner has internalized the realization for a need to seek out knowledge for the sake knowing.

Moore and Dyer (2002) noted that the leadership paradigm in use today is based upon the assumption that leadership can be taught and learned. However, a problem exists in that there is a void in the literature base that identifies the influence of learning style, leadership style, and leadership adaptability on critical thinking disposition. If this void also exists in instructors' understanding of this relationship, more information is warranted to foster the development of critical thinking and leadership skills in students.

Many commonly accepted instructional practices are rooted in traditional behaviorist views. That is, the authentic measure of whether a student has learned or failed to learn is a change in his or her behavior. As applied to this study, if students are taught to think critically, the success of the instructional process can be measured by the fact that students do, indeed, exhibit that behavior. However, the influence of a student's learning style, leadership style, or leadership adaptability on his or her disposition to think critically may impair the process of learning.

This potential impediment to learning leads to several questions regarding the impact of learning styles on the ability and disposition of students to learn and effectively use leadership principles, as well as their disposition to critically think through alternatives before a solution is employed. For example, what is the role of learning styles in enhancing the disposition of students to think critically, develop a "style" of leadership, or adapt to various leadership situations? Are students likely to be more or less adaptable based upon their learning style? What are the implications of teaching to students' preferred learning styles when teaching leadership development? Answering these and other questions about the role of learning styles may provide leadership educators in agricultural education with valuable information needed to effectively teach leadership principles. This study seeks to address many of these questions.

Purpose and Objectives

The purpose of this study was to determine the influence of learning style, leadership style, and leadership adaptability on critical thinking disposition. The objectives of this study were to:

1. Describe the leadership style, learning style, level of leadership adaptability, and critical thinking disposition of students enrolled in a college leadership development course.

2. Determine if differences exist in leadership style and leadership adaptability across learning styles.
3. Determine if differences exist in critical thinking disposition based upon students' leadership styles and adaptability.
4. Determine if differences exist in students' disposition to think critically based upon their learning styles.

Based on these objectives, null hypotheses were developed and tested at an alpha level of .05. The following null hypotheses were tested:

$H0_1$: There is no difference in student leadership style based upon learning style.
$H0_2$: There is no difference in leadership adaptability based upon learning style.
$H0_3$: There is no difference in critical thinking disposition based upon leadership style and leadership adaptability.
$H0_4$: There is no difference in critical thinking disposition based upon learning style.

Procedures

The population for this study consisted of college of agricultural and life sciences students enrolled at a land grant university during the 2003 fall semester. The sample consisted of an intact group of students enrolled in an undergraduate leadership development course (n = 115). Because of the purposive nature of the sample, the findings from this study cannot be generalized beyond the existing group of individuals.

Two standardized instruments were administered to collect data relative to learning style, leadership style, and leadership adaptability. The *Gregorc Style Delineator* (Gregorc, 1982) was used to assess student learning styles. Leadership styles and adaptability were assessed with the *LEAD Self* instrument (Leadership Effectiveness and Adaptability Description – Self Version, 1979). A third instrument, the *EMI: Critical Thinking Disposition Assessment* (Ricketts, 2003), was used to assess critical thinking disposition.

All of the instruments used in this study were pen and paper instruments administered by the researchers. The *Gregorc Style Delineator* (Gregorc, 1982) utilizes a word matrix to assess the preferred learning style of each respondent. The developer established and reported the validity and reliability of the instrument. Internal consistency, via test-retest methodology, has been reported using standardized alphas ranging from .89 to .93 (Myers & Dyer, 2004). The *Delineator* divides 40 words into 10 sets of four words each, whereby respondents rank their reaction to each word within each set. Words that were most descriptive of the respondent merited a rank of four, with least-descriptive words meriting a rank of one. Respondent scores may range from 10 – 40 in a given style category (Myers & Dyer, 2004). A score of 26 or greater is indicative of a respondents' preferred learning style category (e.g., Concrete Sequential, Abstract Random, Concrete Random, and Abstract Sequential).

Developed at the Center for Leadership Studies (Leadership Effectiveness and Adaptability Description – Self Version, 1979), the *LEAD Self* instrument contains 12 leadership situations whereby respondents select from four alternative actions (Hersey et al., 2001). Each alternative corresponds with high task/low relationship behavior, high task/high relationship behavior, high relationship/low task behavior, or low relationship/low task behavior. The respondent selects only the alternative that best describes his or her behavior in each respective situation. Designed to assess leadership style (Telling, Selling, Participating, Delegating) and leadership adaptability, the instrument allows adaptability scores ranging from 0-36, with benchmarks for low (<24), moderate (24-29), and high (30-36) leadership adaptability (Moore & Dyer, 2002).

Derived from *The American Philosophical Association's Delphi Research Report* (Facione, 1990), the *EMI: Critical Thinking Disposition Assessment* (Ricketts, 2003) seeks to assess the Engagement, Cognitive Maturity, and Innovative constructs of respondents' disposition to think critically. Twenty-six items make up the three respective constructs. A Likert-type scale addresses various statements correlated to each construct area. With responses ranging from "Strongly Disagree" to "Strongly Agree," means for each construct are computed from eleven Engagement statements, eight cognitive Maturity statements, and seven Innovative statements. An overall critical thinking disposition score is computed by averaging the means of the three construct scores. Validity was established via expert panel review consisting of university faculty with primary research foci in critical thinking studies. Authors of the instrument reported pilot test results with reliability reported in the range of .57-.86 for the constructs.

Data were analyzed using the Statistical Package for Social Sciences (SPSS), version 12.0. Descriptive statistics were used to achieve the first objective. Cross tabulations and analyses of variance were conducted for the final three objectives and their corresponding null hypotheses.

Findings

The first objective of this study assessed the learning styles, leadership styles, leadership adaptability, and critical thinking dispositions of students in a college of agriculture leadership development course (n = 115). Most participants exhibited one preferred learning style. Concrete Sequential (CS) learners accounted for 36.5% of the respondents, whereas 35.7% of the respondents were Abstract Random (AR) learners; followed by 7% Abstract Sequential (AS) learners, and 6.1% Concrete Random (CR) learners. Interestingly, 14.8% of the respondents exhibited two dominant learning styles: Concrete Sequential and Abstract Random (CS-AR). According to Gregorc (1979), it is common for learners to possess multiple styles. As such, one additional bimodal category was added (see Table 1).

Participants' self-perceived leadership style, as determined by the *LEAD Self* instrument, were primarily in the Selling (63.5%) and Participating (33%) categories. Only 2.6% of the participants reflected a Telling leadership style, whereas less than one percent (.9%) possessed a Delegating leadership style (see Table 2).

Leadership adaptability scores were calculated from the *LEAD Self* instrument and ranged from 12 – 29. According to Hersey et al. (2001), style adaptability scores are categorized as High, Moderate, or Low. Respondents with a score of 30 – 36 possess High adaptability, whereas those with scores from 24 – 29 possess Moderate adaptability. Respondents whose adaptability scores fall below 24 are categorized in the Low adaptability range. Interestingly, all of the respondents fell into the Low (n = 49, 42.6%) and Moderate (n = 66, 57.4%) adaptability ranges, whereas none of the respondents produced High leadership adaptability scores (see Table 3).

Table 1
Student Learning Styles (n-115)

Learning Style	*f*	%
CS	42	36.5
AS	8	7.0
AR	41	35.7
CR	7	6.1
CS-AR	17	14.8

Table 2
Leadership Styles of Students (n=115)

Leadership Style	*f*	%
Telling	3	2.5
Selling	73	63.5
Participating	38	33.0
Delegating	1	0.9

Table 3
Leadership Adaptability Scores of Students (n=115)

Leadership Adaptability Scores	*f*	%
Low (<24)	49	42.6
Medium (24-29)	66	57.4
High (30-36)	0	0.0

Critical thinking disposition scores ranged from 2.69 to 4.69 with a mean disposition score of 3.79 (*SD* = .37) for the sample. Disposition scores were calculated by averaging the mean scores of the Engagement (*M* = 3.76, *SD* = .50), Cognitive Maturity (*M* = 3.75, *SD* = .40), and Innovative (*M* = 3.87, *SD* = .48) constructs from the *EMI: Critical Thinking Disposition Assessment* instrument (Ricketts, 2003). (See Table 4)

The second objective of this study sought to determine the differences in leadership style and adaptability across learning style categories. As indicated in Table 5, students of all learning styles tended to possess leadership styles in the Selling (*n* = 73, 63.5%) and Participating (*n* = 38, 33%) categories. Only three students exhibited a Telling (2.6%) leadership style. Each was a Concrete Sequential learner. A majority of Concrete Sequential learners exhibited leadership styles in the Selling (*n* = 22, 52.4%) and Participating (*n* = 17, 40.5%) categories. Abstract Sequential learners were inclined to have leadership styles primarily in the Selling category (*n* = 6, 75%). Abstract Random learners, like Concrete Sequential Learners, tended to have leadership styles in the Selling (*n* = 28, 68.3%) and Participating (*n* = 13, 31.7%) categories. Concrete Random learners also tended to possess leadership styles in the Selling (*n* = 4, 57.1%)

and Participating (n = 3, 42.9%) categories, as did students of multiple learning styles, CS/AR learners, (n = 13, 76.5%; n = 4, 23.5%; respectively).

Table 4
Critical Thinking Disposition Score by Construct (n=115)

Construct	*M*	*SD*
Engagement	3.76	0.50
Cognitive Maturity	3.75	0.40
Innovativeness	3.87	0.48
Overall Critical Thinking Disposition Score	3.79	0.37

Table 5
Learning style by Leadership Style Cross Tabulation (n=115)

	Leadership Style									
	Telling		Selling		Participating		Delegating		Total	
Learning Style	n	%	n	%	n	%	n	%	n	%
CS	3	0.03	22	19.1	17	14.8	0	-	42	36.5
AS	0	-	6	5.1	1	0.9	1	0.9	8	6.9
AR	0	-	28	24.4	13	11.3	0	-	41	35.7
CR	0	-	4	3.5	3	2.6	0	-	7	6.1
CS-AR	0	-	13	11.3	4	3.5	0	-	17	14.8

An analysis of variance (ANOVA) was used to test the null hypothesis of no differences in leadership style based on learning style. No significant differences were found between learning and leadership styles (p = .94). Therefore, the null hypothesis failed to be rejected (see Table 6).

Table 6
Analysis of Variance of Leadership Style by Learning Style (n=115)

Leadership Style	*df*	*F*	*p*
Between Groups	4	0.20	0.94
Within Groups	110		
Total	114		

The second null hypothesis of no differences in student learning style based upon their leadership adaptability score was also tested using an ANOVA. Again, no significant differences were found between learning style and leadership adaptability score (p = .90). Accordingly, the second null hypothesis failed to be rejected (see Table 7).

The third objective of this study was to determine differences in critical thinking disposition as influenced by the leadership style and leadership adaptability of respondents. No significant differences were detected for leadership adaptability (p = .71), leadership style (p = .71), or the interaction of leadership style and adaptability (p = .84). Therefore, the third null hypothesis of no differences in critical thinking disposition based upon leadership style and adaptability failed to be rejected (see Table 8).

Table 7
Analysis of Variance of Leadership Adaptability by Learning Style (n=115)

Leadership Adaptability	*df*	*F*	*p*
Between Groups	4	0.27	0.90
Within Groups	110		
Total	114		

Table 8
Analysis of Variance of Critical Thinking Disposition by Leadership Style and Leadership Adaptability (n=115)

Source	*df*	*F*	*p*
Leadership Adaptability	14	0.75	0.71
Leadership Style	3	0.46	0.71
Leadership Adaptability * Leadership Style	8	0.52	0.84
Total	114		

The final objective of this study was to determine if differences existed in critical thinking disposition based upon student learning style. A test of the null hypothesis of no difference in critical thinking disposition based upon learning style revealed no significant differences (p= .52) between critical thinking disposition scores based upon a student's style of learning. Again, the null hypothesis failed to be rejected (see Table 9).

Table 9
Analysis of Variance of Critical Thinking Disposition by Learning Style (n=115)

Critical thinking score	*df*	*F*	*p*
Between Groups	4	0.82	0.52
Within Groups	110		
Total	114		

Conclusions/Recommendations/Implications

Objective 1

Overall, study participants' preferred learning styles were primarily in the Concrete Sequential (CS) and Abstract Random (AR) categories, with leadership styles in the Selling domain. These findings generally support previous research results for students in colleges of agriculture. Dyer and Osborne (1996) reported that agriculture students are primarily concrete learners. Garton and Thompson (1999) reported similar results in their longitudinal study. In this study, however, an almost equal number of students were Abstract Random learners. Based upon the work of the aforementioned researchers, this seems to indicate that a higher percentage of AR learners may now be considering careers in agriculturally related fields. However, that assumption goes beyond the scope of this study and must be answered by further research of a longitudinal nature.

Respondents generally scored low on leadership adaptability, but possessed a high disposition to think critically. Given the variation in the learning styles of the respondents, the low adaptability scores were surprising. Based upon Gregorc's (1982) description of Abstract Random and Abstract Sequential learners, it is to be expected that these individuals would possess moderate to high adaptability scores. It is recommended that students be provided learning experiences that assist them in functioning in a multitude of situations, thereby increasing opportunities to raise their leadership adaptability levels.

Objective 2

In this study, learning styles demonstrated no significant influence on either participant leadership style or leadership adaptability. If true in other studies, this may indicate that leadership can be taught to learners of any style, regardless of how they perceive and process information. According to Gregorc's (1982) description of Abstract Random learners, it was expected that students of this learning style would exhibit leadership styles in the Participating or Delegating domains since those areas tend to be more social by nature. By contrast, it was expected that Concrete Sequential learners would likely exhibit leadership styles in the Telling or Selling domains. However, no significant differences were found in the distribution of students in leadership domains based upon learning style. This finding implies that, with proper instruction, every student could be an effective leader. Furthermore, recognizing the need for individuals who are adaptable to a variety of workplace situations, faculty should promote and model a variety of leadership styles and adaptations in contextual situations.

A limitation of this study is the lack of a large enough sample to generate large numbers of respondents in each of the leadership style categories. With only one and three participants in the Delegating and Telling groups, respectively, this lack of data may be misleading, and therein lower the power of the analysis. Again, a longitudinal study may serve to increase representation across the categories and lead to a higher level of confidence in the findings.

Objective 3

For this study, critical thinking disposition was not influenced by either leadership style or leadership adaptability. However, it should be noted that the number of students in the Telling and Delegating leadership style categories were small – as is usually be the case. Likewise, leadership adaptability scores among students tended to be low, thereby not affording the opportunity to maximize variance between groups. Again, it is recommended that a longitudinal study be conducted to provide an ample number of participants to provide a powerful analysis.

Objective 4

In this study, learning style had no significant influence on critical thinking disposition. Gregorc (1982) characterized Concrete Sequential learners as primarily practical, linear, and deliberate. He likewise characterized Abstract Random learners as random, multi-dimensional, and perceptive learners. Students in this study possessed a high disposition to think critically, regardless of preferred learning style. According to Moore and Dyer (2002), students with preferred learning styles in the Abstract Sequential category are more likely to have developed critical thinking skills. Is the same true for critical thinking disposition? Additional research using a larger sample of Abstract Sequential learners should be undertaken to explain this possible relationship. In the meantime, faculty members may serve students best by infusing a variety of teaching strategies and instructional techniques that augment critical thinking disposition development, inclusive of all learning styles.

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THE EFFECTS OF MULTIMEDIA CUES ON STUDENT COGNITION IN AN ELECTRONICALLY DELIVERED HIGH SCHOOL UNIT OF INSTRUCTION

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Abstract

The development of electronic curriculum materials holds great promise and rewards for both educators and learners alike, but little research has been conducted to determine the effectiveness of incorporating multimedia components within a electronically delivered unit of instruction. This research tested the theory of cue-summation (multiple cues across multiple channels) in a high school agricultural education setting and measured the effectiveness of the instruction.

Curriculum materials were created and placed on CD-ROM for asynchronous delivery capability. Materials comprised a week-long unit of instruction on milk processing and were developed in three Treatments (Tx). The first Tx consisted of text-only materials, the second consisted of text and an audio/video component and the third consisted of audio/video and still images. These three Txs represented single cue, redundancy and cue summation, respectively.

One hundred five high school agriculture science students participated in the study. Instrumentation used included a pretest/posttest for cognition as well as a researcher-developed demographic instrument. Data were collected in the fall of 2003 and analyzed using ANOVA techniques to determine significant differences among the Tx groups.

The researcher found that students scored significantly higher on the posttest when exposed to Txs containing an audio/video component. Recommendations include continued research as well as incorporating these findings into current curriculum development efforts for the betterment of the learners involved. Cue-summation produced student performance scores similar to redundancy.

Introduction

In the ever-changing world of education, trends and innovations seem to come and go as often as classes of students. Teachers have little time to adopt new instructional techniques and curriculum before they are outdated and replaced with the "next big thing." In this fluid environment, one innovation seems to have the potential to become not only a common educational instrument, but one that holds great promise for the future of education as we know it. Distance education is not a new concept. The origins of the methodology can be traced back to correspondence courses, the so-called "home-study," first formalized by the Chautauqua Institute in 1883 (Moore & Kearsley, 1996).

With the rise of the Internet, educational institutions now have the ability to not only transfer text-based materials, similar to the original correspondence courses, but to provide the student with hypertext, audio, video, interactive chat and many other methods of instructional delivery. The teacher has now become a facilitator with the responsibility of collecting and disseminating information to the students in the most effective manner. Selecting a mode of delivery has become as important as the content.

For many facilitators, it remains difficult to adequately learn and apply the knowledge needed to incorporate multimedia aspects into a distance-delivered course. Computer programs, hardware, video cameras, microphones and web-servers all play major roles in adding multimedia to a distance course. If facilitators are expected to invest a great deal of time and expense into producing a distance course, they should expect that their efforts will result in an increase in learning and retention by the student when compared to the traditional, text-only version.

A unit of instruction on dairy processing was created using material provided by Instructional Materials Service (IMS). Three versions of this unit were copied to CD-ROM and distributed to high school agriscience students. The three Tx levels reflected the characteristics of the theory of cue summation (Severin 1967a). The first Tx was a simple, text-only version of the curriculum. The second version included both text and an audio/video stream of the material. The third Tx level used the same audio/video stream but replaced the text with relevant pictures. Students were asked to view the unit and complete the posttest on the material. Scores for high, low, and total cognition were recorded.

Theoretical Framework

The research that was conducted in this study was based on two theories of cognitive psychology. The overall theory was the theory of information processing. This theory focuses on how the human memory system acquires, transforms, compacts, elaborates, encodes, retrieves and uses information. The model divides the memory system into three main storage structures: sensory memory, short-term memory and long-term memory. Each structure is synonymous with a type of processing (Burton, Moore, & Holmes, 1995).

In the first type of memory, sensory memory, input is accepted primarily through sight and sound and is processed within three to five seconds. The sensory registers briefly hold the information until the stimulus is recognized or forgotten. According to Klatzky (1980), this assigns meaning to stimulus. For example, the letter "A" is recognized as a letter rather than just a group of lines. From the sensory memory, information travels to the short-term memory.

Information that is recognized and transferred to short-term memory can remain active for 15-20 seconds without rehearsal (Klatzky, 1980) and must be rehearsed, elaborated, used for decision making, or stored in long-term memory before it is forgotten. For this reason, Klatzky termed short-term memory, "working memory." According to Miller (1956), the short-term memory has room for about seven chunks of information, plus or minus two, depending on the individual. Because of this limited cognition capacity, information must be coded and stored into long-term memory.

Long-term memory is an unlimited and permanent storehouse of information that is complex in structure and function. Long-term memory receives information from both sensory memory and short-term memory. Information in the sensory registers is compared to information in long-term memory for recognition, and long-term memory stores input from sensory memory and short-term memory.

The second theory that applies to this study is cue summation. This is an information processing theory that deals specifically with learning and retention in a multimedia environment. The cue summation theory states that learning is increased as the number of available stimuli are increased (Severin 1967a). Severin (1967b) goes on to state that: "Multiple-channel communications appear to be superior to single-channel communications when relevant cues are summated across channels, neither is superior when redundant between channels, and are inferior when irrelevant cues are combined (presumably because irrelevant cues cause interference between them)," (p. 397). In other words, the stimuli provided on different channels have to be relevant to each other or the distraction would cause a decrease rather than an increase in learning and retention.

Severin (1968) found that the combination of auditory signals with a visual presentation, providing a different but related cue to the stimulus object, was more effective in producing recognition than a combination with a visual presentation of the same cue – a redundant condition.

Table 1 demonstrates the levels of the Tx where level 1 is a single cue using the visual channel in the digital mode (single cue). Tx level 2 combines text with the spoken word using both the audio and visual channels but within the same mode (redundancy). Tx level 3 used the audio channel and digital mode for the first cue and the visual channel and iconic mode for the second cue (cue-summation).

Table 1.
Tx Levels Based on Cues Combinations in Channels and Modes.

		Channels	
		Audio	Visual
Modes	Digital	Spoken word "pasteurizer" [2,3]	Printed word "pasteurizer" [1,2]
	Iconic	Sound of a pasteurizer in operation	Picture of a pasteurizer [3]

[1]Single Cue - Visual Channel, Digital Mode
[2]Redundancy – Audio and Visual Channel, Digital Mode
[3]Cue Summation – Audio and Visual Channel, Digital and Iconic Mode

Purpose Research Hypotheses

The purpose of this study was to provide an asynchronous, electronically delivered unit of instruction to high school agricultural education students and compare performance based on the combination of channels used to provide the information. These channels (text, audio, video and images) were incorporated in an instructional unit on milk processing and delivered to the students on CD-ROM.

Research Hypotheses

As a means of accomplishing the purpose of the study, three major hypotheses were tested:

1. Within the constructs of a multimedia course, total student cognition will significantly increase as the number of differentiated channels used to deliver instruction increases, holding previous knowledge of the subject matter constant.
2. Within the constructs of a multimedia course, low-level student cognition will increase as the number of differentiated channels used to deliver instruction increases, holding previous knowledge of the subject matter constant.
3. Within the constructs of a multimedia course, high-level student cognition will increase as the number of differentiated channels used to deliver instruction increases, holding previous knowledge of the subject matter constant.

Methods and Procedures

Population and Sample

The population for this quasi-experimental, non-equivalent control group design study included primary first-year agricultural education students. The unit of instruction was administered by student teachers at 6 student teaching centers. Within these six schools, the entry-level agriculture course was taught in 12 classes, making up the sample for this study. Each of the 12 classes was then randomly assigned to a Tx group.

This sampling plan yielded a sample size of 169 students, with 50 students in Tx group one, 64 students in Tx group two and 55 students in Tx group three. During the course of the research, several issues came to light that would reduce the number of students in each Tx group. Mortality based on student transfers, failure to complete consent forms, and absences reduced the number of observation in each Tx group. Two classes were also removed for failure to complete the unit according to the instructions. These reductions resulted in 105 students that participated in all aspects of the study.

According to Gall et al. (1996), a group size of at least 15 observations is needed to accurately conduct experimental research, but in general, each group should be maximized as much as possible given researcher time and financial constraints. According to Kirk (1995), sample size can be calculated based on the number of levels of the independent variable being tested and the desired ά. In this case, the researcher was testing three levels of the independent variable and set the *a priori* alpha level at .05 for determining significance. In this case, group sizes of 21 subjects per Tx were required in order to meet these qualifications. The actual Tx groups of 26, 49, and 30 were more than required for this study.

Instrumentation

The original pretest/posttest consisted of 10 true/false, 10 multiple-choice and three short answer questions. The true/false and multiple-choice questions were derived from the two IMS curriculum unit tests provided in the teacher's guide. The true/false questions were used exactly as presented by IMS, but the multiple choice questions were created from short answer and fill-in-the-blank type questions. This was done in order to ensure accuracy and constancy of scoring the instrument. The first 20 questions were all lower-level cognition items. These questions were written to match the objectives of the unit as stated by IMS.

The last three questions were researcher-developed, open-ended questions that allowed for higher order thinking in the responses as defined by Newcomb and Trefz (1987). The information in these three questions was not taught directly in the course of the unit, but required students to evaluate the information they had learned and apply it to a new situation.

Great care was taken by the researchers to ensure that items accurately reflected the constructs within the curriculum. Content and face validity of the pretest/posttest was verified by a national panel (Gall, Borg and Gall, 2000) of food science, dairy science and dairy processing faculty members. Minor changes were made based on the panel's recommendations.

A sample of eighteen students was selected to pilot test the instrument for reliability. The students were instructed to carefully consider each question and make their best attempt to determine the correct answer. These scores were entered into Microsoft Excel® as 1 (correct answer) and 0 (incorrect answer). SPSS was used to determine the KR-20 coefficient alpha. The results of this analysis yielded an $r = .52$. This process also determined that three of the original 20 questions were negatively impacting the reliability of the instrument. Eliminating these questions resulted in an $r = .83$. The three items which negatively impacted the reliability of the instrument were permanently deleted from the pretest/posttest before it was administered to the Tx groups. This yielded 17 true/false, multiple-choice questions as well as three open-ended, short answer questions. The post-hoc reliability score decreased slightly to $r = .77$.

The second data collection instrument consisted of a demographic questionnaire. Face and content validity were verified using a team of three faculty members in the Department of Agricultural Education and Communications who possessed knowledge and experience in creating similar instruments. This instrument was completed by the students during researcher visits to the individual schools during Sept. 2-5.

Data Collection

Students in the selected schools were given an informed consent form to be read and signed by their legal guardians. The researcher traveled to each school during Sept. 2-5 to collect these forms as well as data on demographics.

During these visits, the researcher administered the pretest. Data from these two instruments were coded and entered into SPSS for analysis at a later time. The informed consent forms were collected from the students and coded 1 (allowed) and 0 (disallowed) into the same database. Only data collected from students who were allowed to participate were included in the final statistical analysis.

The student teachers involved in the data collection process participated in a training session during the four-week, on-campus "block" before their field work began in the fall of 2003. During the week of Oct. 6-10, 2003, the student teachers facilitated the unit of instruction, conducted the laboratory experiment, collected homework and administered the posttest. All materials were returned and tests were graded by the researcher.

Analysis of Data

Data were collected and imported to SPSS version 11.0 for Windows for analysis. In order to analyze the data on student cognition (low, high, total), several techniques were used. The student pretest was correlated to the posttest to determine the relationship between the two instruments. Trochim (2001) states that in order to use ANCOVA design, the pretest should be highly correlated to the posttest. If a high correlation exists ($r > = .7$), ANCOVA was used to hold previous student knowledge constant while determining the effect of the three Txs on student posttest performance. A moderate or low ($r =< .7$) allowed the researcher to remove the pretest and conduct a one-way ANOVA to determine the effect of the Tx groups on the posttest score. Contrast coding was used to determine differences in groups when the ANOVA indicates a statistically significant difference between Tx group scores. Tx One was compared to Txs Two and Three, then Tx Two was compared to Tx Three.

Another purpose of using contrast coding was to check for the presence of trends in the data. The shape of the functions relating the Tx levels to the level of cognition were of interest to the researcher. SPSS for Windows 11.0 was used to determine effect size and was reported as eta squared ($\acute{\eta}^2$). In general, $\acute{\eta}^2$ is interpreted as the proportion of variance of the dependent variable that is related to the factor. Traditionally, $\acute{\eta}^2$ values of .01, .06, and .14 represent small, medium and large effect sizes, respectively (Green, Salkind, & Akey, 2000).

Result/Findings

Research Hypothesis 1

Within the constructs of a multimedia course, total student cognition will increase as the number of differentiated channels used to deliver instruction increases, holding previous knowledge of the subject matter constant.

A Pearson Product Moment Correlation was calculated to determine the relationship between the pretest total score and the posttest total score. The resulting value for this calculation was determined to be $r = .16$. Because this value was less than $r < .70$ (Trochim, 2001), a one-way analysis of variance was conducted to evaluate the relationship between total cognition and the three Tx levels of the independent variable. The dependent variable for this research hypothesis was the student's total cognition for the unit of instruction as measured by the posttest total score for each individual student. Results of the one-way ANOVA are reported in Table 2.

The ANOVA was statistically significant, $\underline{F}$ (2, 102) = 4.805, $\underline{p}$ = .010. The strength of the relationship between the three Txs and the posttest score, as assessed by SPSS, was medium with the three Tx levels accounting for 8.6% of the variance of the dependent variable. Levene's statistic was calculated to determine homogeneity of variances. The results of this test were not significant, $\underline{F}$ (2, 102) = 2.963, $\underline{p}$ = .056, therefore the researcher assumed that the variances of the three Tx groups were not significantly different from each other. Contrast coefficients were used to evaluate differences among the means. Two contrast groups were created. Contrast one compared Tx One (text-only) to Txs Two (text + A/V) and Three (images + A/V). Contrast two compared Txs Two and Three.

Table 3 indicates that there was a statistically significant difference t (102), = 3.06, p = .003, between the text-only Tx and the Txs containing A/V components and that there was no statistically significant difference t (102), = -.09, p = .926, between Txs Two and Three. The groups that received an audio/video component in the curriculum scored statistically significantly higher than the group that received the text-only Tx. There was no difference in the Second and Third Txs. A significantly linear trend was detected $\underline{F}$ (1, 102) = 6.578, $\underline{p}$ = .012 as can be seen in Figure 1. Participants who received audio/video components in the unit of instruction scored 8.68% higher on the posttest than students who received text without an audio/video component.

Table 2.
Changes in Total Posttest Scores for Text-Only, Text + Audio/Video, and Images + Audio/Video.

Group	*n*	*M*[1]	*SD*			
Text-Only	26	11.19	2.980			
Text + A/V	49	13.80	3.840			
Images + A/V	30	13.72	3.923			
Total	105	13.13	3.805			
Source	SS	df	MS	F	p	$ή^2$
Between	129.675	2	64.837	4.805	.010	.086
Within	1376.339	102	13.494			
Total	1506.014	104				

[1] 20-point scale

Table 3.
Comparison of Tx Effects on Total Posttest Scores.

Contrast	Tx 1 (text-only)[1]	Tx 2 (text + A/V)[1]	Tx 3 (images + A/V)[1]	Value of Contrast	Std. Error	*t*	*df*	*p*
1	-2	1	1	5.13	1.67	3.06	102	.003
2	0	-1	1	-.08	.90	-.09	102	.926

[1] Coding for contrasts.

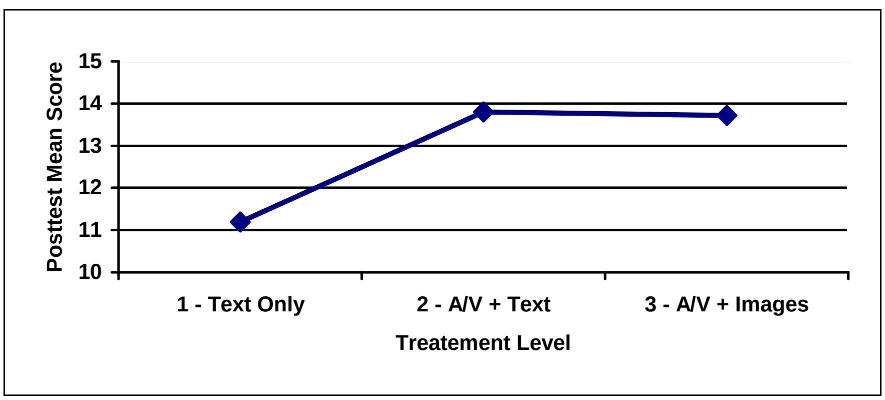

Figure 1. Total Posttest Mean Score by Tx (F_{Linear} (1, 102) = 6.578, p = .012).

Research Hypothesis 2

Within the constructs of a multimedia course, low-level student cognition will increase as the number of differentiated channels used to deliver instruction increases, holding previous knowledge of the subject matter constant.

Low cognition items on the pre and posttest consisted of seven true/false and 10 multiple choice questions. These items were graded and entered into the database as right (1) or wrong (0). A Pearson Product Moment Correlation was calculated to determine the relationship between the pretest low cognition score and the posttest low cognition score. The resulting value for this calculation was determined to be r = .122. Because this value was less than .7 (Trochim, 2001), a one-way analysis of variance was conducted to evaluate the relationship between low cognition and the three Tx levels of the independent variable. The dependent variable for this research hypothesis was the student's performance on lower-level cognitive test items for the unit of instruction as measured by the posttest low score for each individual student. Results of the one-way ANOVA are reported in Table 4.

The ANOVA was statistically significant, F (2, 102) = 3.413, p = .037. The strength of the relationship between the three Txs and the posttest score as assessed by SPSS, was less than the effect size for total cognition but still medium with the three Tx levels accounting for 6.3% of the variance of the dependent variable.

Contrast coefficients were used to evaluate differences among the means. Levene's statistic was calculated to determine homogeneity of variances. The results of this test were not significant, F (2, 102) = 2.963, p = .056, therefore it was assumed that the variances of the three Tx groups were not statistically significantly different from each other. Contrast 1 compared Tx 1 (text-only) to Txs 2 (text + A/V) and 3 (images + A/V). Contrast 2 compared Txs 2 and 3.

Table 4.
Changes in Low Cognition Posttest Scores for Text-Only, Text + Audio/Video, and Images + Audio/Video.

Group	*n*	*M*[1]	*SD*			
Text-Only	26	10.35	2.382			
Text + A/V	49	12.29	3.446			
Images + A/V	30	12.13	3.371			
Total	105	11.76	3.269			
Source	SS	df	MS	F	p	$ή^2$
Between	69.696	2	34.848	3.413	.037	.063
Within	1041.351	102	10.209			
Total	1111.048	104				

[1] 17-point scale

Table 5 indicates that while there was a statistically significant difference t (102), = 2.56, p = .012, between the text-only Tx and the Txs containing A/V components, there was no statistically significant difference t (102), = -.20, p = .837, between Txs 2 and 3.

Table 5.
Comparison of Tx Effects on Low Cognition Posttest Scores.

Contrast	Tx 1 (text-only)[1]	Tx 2 (text + A/V)[1]	Tx 3 (images + A/V)[1]	Value of Contrast	*SE*	*t*	*df*	*p*
1	-2	1	1	3.73	1.456	2.56	102	.012
2	0	-1	1	-.15	.741	-.20	102	.837

[1] Coding for contrasts.

The groups that received an audio/video component in the curriculum scored significantly higher on the low cognition questions than the group that received text only. There was no difference in the second and third Txs based on audio/video with text and audio/video with images. A significantly linear trend was detected F (1, 102) = 4.358, p = .039 and is displayed in Figure 2.

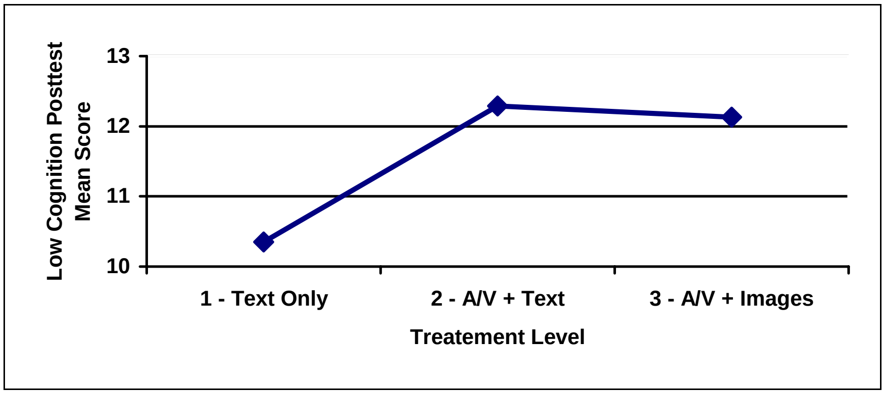

Figure 2. Low Cognition Posttest Mean Score by Tx. (F_{Linear} (1, 102) = 4.358, p = .039).

Research Hypothesis 3

Within the constructs of a multimedia course, high-level student cognition will increase as the number of differentiated channels used to deliver instruction increases, holding previous knowledge of the subject matter constant.

High cognition items on the pre- and posttest consisted of three open-ended, short answer questions. These items were graded using a rubric and entered into the database as right (1) or wrong (0). Students who partially answered the question but failed to answer completely were given partial credit (.5) for that particular question. The Pearson Product Moment Correlation was determined to be r =.201. Because this value was less than r = .7 (Trochim, 2001), a one-way analysis of variance (Table 6) was conducted to evaluate the relationship between high cognition and the three Tx levels of the independent variable.

The ANOVA was statistically significant, F (2, 102) = 6.686, p = .002. The strength of the relationship between the three Txs and the posttest score as assessed by SPSS, was higher than the effect size for total and low cognition. The effect size was high with the three Tx levels accounting for 11.6% of the variance of the dependent variable.

Table 6.
Changes in High Cognition Posttest Scores for Text-Only, Text + Audio/Video, and Images + Audio/Video.

Group	*n*	*M*[1]	*SD*			
Text-Only	26	.85	.858			
Text + A/V	49	1.51	.857			
Images + A/V	30	1.58	.800			
Total	105	1.37	.886			
Source	SS	df	MS	F	p	$\acute{\eta}^2$
Between	9.462	2	4.731	6.686	.002	.116
Within	72.171	102	.708			
Total	81.633	104				

[1] 3-point scale

Contrast coefficients were used to evaluate differences among the means. Levene's statistic was calculated to determine homogeneity of variances. The results of this test were not significant, F (2, 102) = .246, p = .782, therefore assume that the variances of the three Tx groups were not significantly different from each other. Contrast one compared Tx One (text-only) to Txs Two (text + A/V) and Three (images + A/V). Contrast 2 compared Txs Two and Three.

Table 7 indicates that while there was a statistically significant difference t (102), = 3.66, p = <.000, between the text-only Tx and the Txs containing A/V components, there was no statistically significant difference t (102), = .375, p = .708, between Txs Two and Three. The groups that received an audio/video component in the curriculum scored significantly higher on the higher cognition questions than the group that received text only. There was no difference in the second and third Txs based on audio/video with text and audio/video with images. A significantly linear trend was detected F (1, 102) = 7.569, p = .001 and is displayed in Figure 3.

Table 7.
Comparison of Tx Effects on Low Cognition Posttest Scores.

Contrast	Tx 1 (text-only) [1]	Tx 2 (text + A/V) [1]	Tx 3 (images + A/V) [1]	Value of Contrast	*SE*	*t*	*df*	*p*
1	-2	1	1	1.40	.383	3.66	102	<.0
2	0	-1	1	.07	.195	.375	102	.708

[1] Coding for contrasts.

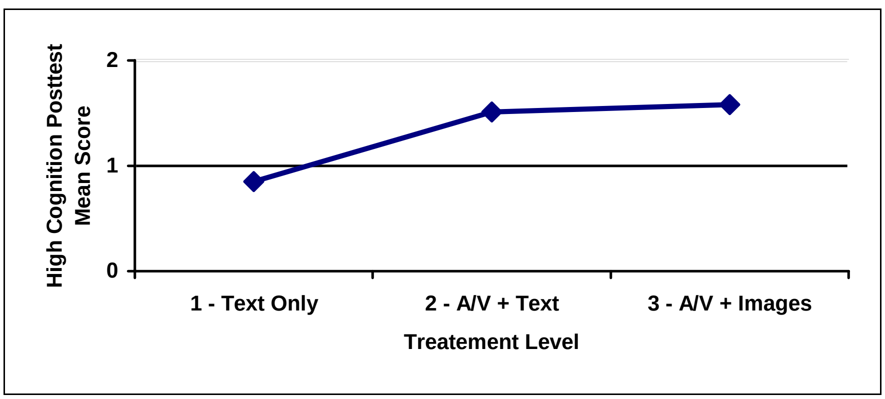

Figure 3. High Cognition Posttest Mean Score by Tx. (F_{Linear} (1, 102) = 7.569, p = .001).

Conclusions/Discussion

The results of this study indicate that a linear relationship exists between the number of differentiated channels and low, high and total student cognition gained from the electronic unit of instruction, but the three hypotheses were found to be untrue as student low, high, and total cognition increased significantly between Txs One and Two but not significantly between Txs Two and Three. Severin (1968) stated that true cue-summation would lead to significantly more learning than single channel or redundant cues within the same channel. This study failed to confirm that statement. The reason for this may be found in arguments made by Cushman (1973) who stated that a second channel had to add new information to the cues of the first channel or there could be no summation. If this is the case, then redundancy is taking place rather than cue-summation. The researcher's efforts to prevent this may have proven inadequate and produced two Txs of redundancy. Severin (1967b), Cushman (1973), Nugent (1982) and Yang (1993) determined that multiple cues (either redundancy or cue-summation) were superior to single channel cues. This research confirmed those findings in that students who were administered Txs containing multiple cues performed significantly higher than students who received only a single cue. This would indicate that providing multiple cues for students would be beneficial in the learning process, however, attempting to create cue-summation may be more difficult than is practically feasible for most teachers.

Recommendations

Recommendations for Improvement of Practice

The research presented here indicates that in the electronic format commonly used for distance education delivery, both redundancy and cue-summation are superior to a single cue. Researchers, teachers, and instructional designers should make concerted efforts to incorporate the use of multimedia content into future efforts.

Recommendations for Further Research

The United States Department of Education (2003) makes several recommendations for research practices to ensure the quality and quantity of empirical evidence meets standards acceptable for use in general education settings. This research followed those guidelines in regards to the planning, collection and analysis of data, but several improvements could be made to improve future research. The USDE states: "A general guideline is that the study should lose track of fewer than 25 percent of the individual originally randomized – the fewer lost the better. This is sometimes referred to as the requirement for 'low attrition'."

This study lost roughly 38% of the originally randomized participants through course transfers or administrative removal. This limitation should be addressed by future researchers and measures should be taken in order to reduce or eliminate student attrition during the course of the study.

A second area of concern based on the USDE recommendations has to do with long-term outcomes. The guideline from the USDE reads: "The study should preferably obtain data on long-term outcomes of the intervention so that you can judge whether the intervention's effects were sustained over time."

The final area of concern deals with sample size for finding a statistically significantly result. The USDE recommends 50-60 classrooms or 300 individuals. This is contrary to Kirk (1995) whose calculations were used to arrive at the minimum for this study of 21 individuals per Tx group. It is safe, however, to recommend that the observations be maximized to the fullest extent of the researcher's abilities and funding.

Given these guidelines, the researcher suggests the following:

1. Replication on populations outside the limited geographical scope of this project.
2. Increase population size to the point that classrooms could be the unit of observation rather than individual students.

3. Conduct testing to determine the effects of block versus traditional scheduling on student performance.
4. Additional creation and testing of multimedia curriculum in an effort to determine the internal effects and nuances of cue-summation with a variety of images in an effort to select the most effective.

In addition, the researchers caution against generalizing these findings outside the population used for this research.

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THE INFLUENCE OF STUDENT LEARNING EXPERIENCE LEVEL AND LEARNING STYLE ON ACHIEVEMENT

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Abstract

An emerging trend on university campuses has been to offer courses totally online, or with a blend of online and face-to-face components. In 2002, over 80% of public universities offered both blended and online courses to their on-campus students. It is reasonable to assume that students enrolled in an online class have a different learning experience and experience the course content differently than students enrolled in a face-to-face class, recognizing that different does not necessarily imply better or worse. The purpose of this quasi-experimental study was to determine if that difference in experience with the course content affects the amount of learning for students of differing learning styles. The sample used in this study consisted of undergraduate students enrolled in an introductory food science course. The control group consisted of students enrolled in a section of the course taught with a traditional lecture (N = 253). The experimental group consisted of students enrolled in a section of the course taught asynchronously using WebCT® and web pages (N = 247). Results indicated no differences for Concrete Sequential, Concrete Random, and Abstract Sequential learners. A significant, but impractical difference was found for Abstract Random learners, who achieved higher in the control group.

Introduction

In 2000, 15.3 million students were enrolled in post-secondary degree-granting institutions, which represented an 11% increase since 1990 (National Center for Educational Statistics, 2002). Further, over 51% of these students were enrolled at larger universities with enrollments of over 10,000 students (which represented only 11% of all universities). Larger campuses may offer an efficiency of scale; however, larger enrollments can make offering sufficient courses challenging.

An emerging trend on university campuses has been to offer courses totally online, or with a blend of online and face-to-face components (Allen & Seaman, 2003). In 2002, over 80% of public universities offered both blended and online courses to their on-campus students. They go further to assert then given a choice between an online and a traditional course that students will enroll in the online version, indicated by over 1.6 million students that took an online course in the Fall of 2002.

It is reasonable to assume that students enrolled in an online class have a different learning experience than students enrolled in a face-to-face class, recognizing that different does not necessarily imply better or worse. Further, as different learning experiences occur, it is reasonable to presume that as students construct meaning from their respective experiences that certain experiences may be better suited for certain students.

Theoretical Framework

This study was guided by the grand-level theory of constructivism, with its central precept that students actively construct meaning from their experiences (Doolittle & Camp, 1999). More specifically, student learning experiences consist of complex interactions between other students, the instructor, and the content (Moore, 1989). In some instances, student learning experiences also involve interaction with technologies (Hillman, Willis, & Gunawardena, 1994). It was also recognized that student learning experiences do not occur isolation, but rather in complex social environments (Vygotsky, 1978)

Additionally, student experience with content can occur at different levels from direct to indirect (Dale, 1946). Presented as a *Cone of Experience*, Dale posited that at the most direct level students learn through direct participation or concrete experience with the content, while at the most in-direct stage students experience the content abstractly through verbal symbols. Thus, student interaction with content can occur on a continuum from direct, concrete experience to abstract, vicarious experience.

The theory that students have a preferred way of inputting, processing, and storing information also framed this study (Gregorc, 1982a). Often referred to as learning or cognitive style, this preference is not synonymous with academic ability. Numerous taxonomies have been developed to differentiate learning styles (Dunn & Dunn, 1993; Gregorc, 1982a; Kolb, 1984; Witken & Goodenough, 1981). Gregorc's work has identified four categories of student learning styles: concrete sequential (CS), concrete random (CR), abstract sequential (AS), and abstract random (AR).

According to Gregorc (1982a), CS learners approach learning in a logical, concrete, objective fashion. They utilize their senses to collect data. CS learners prefer orderly, quiet learning environments. CR learners also approach learning in a logical fashion, but they utilize intuition and instinct to collect data. CR learners prefer active learning environments, but are adept at learning by themselves. AS learners approach learning from an abstract perspective, relying on symbols and signs. They think logically and are comfortable working with theories. AS learners prefer lectures and reading assignments. AR learners approach learning with their feelings and emotions. They organize content in non-liner fashions. AR learners prefer learning in groups with much interaction.

In summary, students learn by constructing meaning from their experiences, which can occur at different levels. Further, students have preferred learning styles. As depicted in Figure 1, conceptually, students enter a learning environment with a preferred way of learning. In that learning environment, they experience the content somewhere on a continuum from concrete to abstract. In turn, they learn the content to some proficiency.

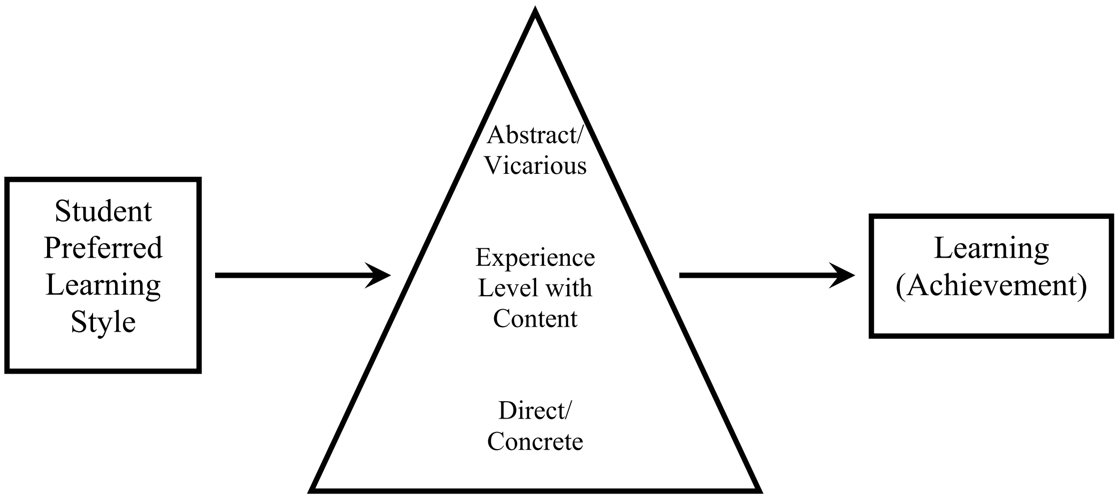

Figure 1. Model of the Relationship between Learning Style, Experience Level, and Learning

Previous research has documented the influence of learning styles when student learning experiences are affected by teaching approach. For example, Dyer and Osborne (1996) found that field-neutral students scored significantly higher on achievement tests when students were taught with the problem-solving approach, which provides more concrete interaction with the content. In an earlier study, Marrison and Frick (1994) compared students of differing learning styles (field independent/dependent) on achievement and perceptions when course content was presented as a lecture verse a "multimedia" approach (that consisted of text, still pictures, and graphics). They reported no difference in achievement. However, field dependent learners expressed a desire for sound in the "multimedia" approach.

Student experiences in a course are affected by the method used to deliver course content. As such, researchers have compared courses delivered face-to-face and those mediated through technology. Results generally support the premise that courses delivered through technology can be equivalent to courses taught face-to-face (Born & Miller, 1999; Miller & Pilcher, 2000; Miller & Shih, 1999; Russell, 1999).

Recognizing that delivering course content mediated through technology was a different learning experience for students, several researchers examined if differences existed in achievement based on learning style. Results of this line of inquiry produced conflicting results. For example, Daniel (1999) as well as Oxford, Park-Oh, Ito, and Sumrall (1993) reported an influence, while Day, Raven, and Newman (1998) along with Freeman (1995) found no relationship. The variability in conclusions drawn by these researchers clouds the picture of the influence of learning styles. Therefore, a conclusive statement regarding the influence of learning styles cannot be made.

Existing research examined student experiences at the macro-level (entire courses), either comparing technology mediated courses to face-to-face courses or examining the influence of learning styles in course achievement. However, examining these variables at the macro-level does not provide insight in to specific learning activities delivered at different levels of experience (concrete verse abstract). Missing from the literature are studies examining how the type of experiences provided to students at the micro level (units of instruction) affect achievement.

Purpose/Objectives

The purpose of this study was to determine if the level of experience with course content affects the amount of learning for students of differing learning styles. Initially, one null hypothesis was used to guide this study.

Ho: There is no difference between groups in achievement across learning styles.

Upon initial data analysis, it was determined that students of each learning style should be examined individually. Consequently, four null hypotheses were developed that address each learning style, respectively. These hypotheses were used to further guide this study.

Ho_1: There is no difference between groups in achievement for Concrete Sequential students.

Ho_2: There is no difference between groups in achievement for Concrete Random students.

Ho_3: There is no difference between groups in achievement for Abstract Sequential students.

Ho_4: There is no difference between groups in achievement for Abstract Random students.

Methodology

To address the purpose of this study and test the null hypotheses, a quasi-experimental design was used. Specifically, a nonrandomized control group, pre-test – post-test design was chosen (Ary, Jacobs, & Razavieh, 2002). This design was necessary, because participants were already assigned to intact groups, so random assignment was not possible. Without random assignment, groups cannot be considered equivalent prior to beginning the study, but differences can be statistically controlled for (Ary et al., 2002). This study consisted of two groups – a control group and an experimental group.

Ary et al. (2003) indicated that if the groups do not differ on pre-test scores the selection threat to internal validity is eliminated. They go further to posit that because the study occupied the same period of time and both groups take the same pre-test and post-test that maturation, instrumentation, pretesting, history, and regression should not be threats to internal validity.

Both the control and experimental groups were taught by the same instructor and consisted of students enrolled in an introductory undergraduate food science course taught at a large university. The treatment period consisted of one-third of the content covered in the course and was two weeks in duration. Both groups had access to the same supplemental texts.

The control group consisted of students enrolled in a section of the course taught with a traditional lecture (*N* = 253). Class sessions were held in a lecture hall and consisted of the instructor presenting the content using PowerPoint® slides as a visual supplement to the lecture and class discussions. In this group, student experiences consisted of direct interaction with the instructor and with fellow students throughout the class sessions. For this group, the treatment period of two weeks consisted of 9 class sessions that lasted approximately 1 hour and 15 minutes, although some of this time was used for announcements and other housekeeping activities typically associated with teaching a class.

The experimental group consisted of students enrolled in a section of the course taught asynchronously using WebCT® and web pages (*N* = 247). The content was delivered using streaming videos that consisted of an auditory recording of the instructor delivering the lecture and the same PowerPoint® slides as the control group. This delivery method provided a more abstract experience than the control group and has been previously called an illustrated web lecture (Roberts, 2003). In this group, student experiences consisted of reading and listening with little or no direct interaction with other students or the instructor. However, they did have the opportunity to interact through electronic mail. For this group, the treatment period of two weeks consisted of nearly six hours of streaming videos that the students could view at their own pace. Students also had access to web pages that contained the same announcements as were delivered to the control group.

As indicated previously, this study used a pre-test – post-test design. The instructor of the course developed the instrument used as the post-test. This was deemed appropriate, as the instructor was the subject matter expert. The researcher then created a parallel form to use as the achievement pre-test. Ary et al. (2002) defined a parallel form as one that is as similar as possible in content, difficulty, length, and format. This was achieved in this study by altering the ordering of the questions, altering the ordering of the responses for each question, and rewording questions from the post-test. The instruments consisted of 100 single-response multiple-choice questions. Both instruments were evaluated for face validity by an expert panel. The instructor of the course evaluated the instruments for content and construct validity. Post hoc reliability analysis yielded a Kuder-Richardson-20 score of .82. Both the pre-test and the post-test were administered as web-based forms.

Learning styles were assessed using the Gregorc Style Delineator (Gregorc, 1982a). This instrument was chosen based on its ability to separate learners into four distinct learning styles and the relative ease to create an electronic version of the instrument. The instrument identifies people as Concrete Sequential (CS), Concrete Random (CR), Abstract Sequential (AS), and Abstract Random (AR). Gregorc (1982b) has previously established the validity and reliability of this instrument (alphas for each construct ranged from .89 to .93). A web-based version of this instrument was used in this study.

A researcher-developed web-based instrument was utilized to collect demographic data in this study. An expert panel evaluated the instrument for face and content validity. Because questions had "an accurate, ready-made answer", the questions did not elicit demands for considerable time, thought, nor variation and therefore posed no reliability risks (Dillman, 2000).

Results

The control group consisted of 80 males and 173 females, while the experimental group contained 100 males and 147 females (see Table 1). When comparing the gender makeup of the two groups, a difference was observed ($X^2_{(1,\ N\ =\ 500)} = 4.53$, $p = .033$). However, subsequent correlation analysis revealed that gender was not practically or significantly correlated with post-test score ($r = -.05$, $p = .225$). Therefore, gender was excluded from further analysis.

Table 1
Gender Frequencies by Group

	Control Group		Experimental Group	
Gender	*f*	%	*f*	%
Male	80	31.62	100	40.50
Female	173	68.37	147	59.50

Note. Groups differed on gender ($X^2_{(1,\ N = 502)} = 4.53$, $p = .033$)

The two groups were also compared to determine if there was a difference in learning styles among students in each group. The control group had 86 CS students, 64 CR students, 30 AS students, and 73 AR students (see Table 2). The experimental group had 88 CS students, 60 CR students, 43 AS students, and 56 AR students. Chi-square analysis revealed that the two groups did not significantly differ ($X^2_{(3,\ N = 500)} = 4.636$, $p = .200$).

Table 2
Descriptive Statistics of Pre-test Scores by Group

	Control Group			Experimental Group		
Learning Style	N	*M*	*SD*	N	*M*	*SD*
Concrete Sequential	86	35.56	10.40	88	34.93	10.49
Concrete Random	64	32.80	13.30	60	33.43	9.82
Abstract Sequential	30	36.67	13.08	43	37.77	13.64
Abstract Random	73	33.37	10.68	56	36.09	12.31
Total	253	34.36	11.62	247	35.32	11.39

Note. Learning style frequencies did not differ between groups ($X^2_{(3,\ N = 500)} = 4.636$, $p = .200$)

Pre-test scores were normally distributed around the mean. As seen in Table 2, the lowest mean score was observed for CR students in the control group ($M = 32.80$, $SD = 13.30$), while the highest was observed for AS students in the experimental group ($M = 37.77$, $SD = 13.64$).

Two-factor Analysis of Variance was conducted to determine the effects of group, learning style, and the interaction between the two on pre-test scores (see Table 3). No significant differences between groups were observed. Results indicated no main effect for group ($F_{(1,\ 492)} = .775$, $p = .379$), no main effect for learning style ($F_{(3,\ 492)} = 2.015$, $p = .111$), and no main effect for the interaction between group and learning style ($F_{(3,\ 492)} = .524$, $p = .666$).

Table 3
Two-factor Analysis of Variance of Pre-test Scores

Source	*df*	*F*	*p*	η^2
Intercept	1	4160.098	.000	.894
Group	1	.775	.379	.002
Learning Style	3	2.015	.111	.012
Group*Learning Style	3	.524	.666	.003
Error	492			
Total	500			

Post-test score data was collected for 496 students, which represented a loss of four participants. Descriptive statistics are presented in Table 4. Post-test means were normally distributed around the mean. The lowest mean score was observed for AR students in the experimental group (*M* = 54.42, *SD* = 7.93), while the highest was observed for AR students in the control group (*M* = 57.67, *SD* = 8.54).

Table 4
Descriptive Statistics of Post-test Scores by Group

	Control Group			Experimental Group		
Learning Style	*N*	*M*	*SD*	*N*	*M*	*SD*
Concrete Sequential	86	57.52	8.67	87	56.78	9.21
Concrete Random	63	55.25	8.77	60	56.78	8.81
Abstract Sequential	30	56.07	8.13	42	55.86	8.50
Abstract Random	73	57.67	8.54	55	54.42	7.93
Total	252	56.83	8.61	244	56.09	8.71

Ho: There is no difference between groups in achievement across learning styles.

Two-factor Analysis of Covariance was conducted to determine the effects of group, learning style, and the interaction between the two had on post-test scores, while controlling for pre-test scores (see Table 5). Results indicated an effect for pre-test score ($F_{(1, 487)} = 32.248$, $p = .000$). In contrast, it indicated no main effect for group ($F_{(1, 487)} = 1.159$, $p = .282$) and no main effect for learning style ($F_{(3, 487)} = .748$, $p = .524$). As such, the null hypothesis was not rejected.

Table 5
Two-factor Analysis of Covariance of Post-test Scores

Source	*df*	*F*	*p*	η^2
Intercept	1	1635.504	.000	.771
Pre-test	1	32.248	.000	.062
Group	1	1.159	.282	.002
Learning Style	3	.748	.524	.005
Group*Learning Style	3	2.064	.104	.013
Error	487			
Total	496			

Although not significant at $\alpha = .05$, the effect of the interaction between group and learning style ($F_{(3, 487)} = 2.064$, $p = .104$) and the limited research in this area presented grounds to further explore the effect of learning style. As such, the simple main effects of group were examined for each learning style. To test the effect of group membership for students of each learning style while controlling for pre-test score, four additional null hypotheses were developed, addressing CS, CR, AS, and AR students, respectively.

Ho_1: There is no difference between groups in achievement for Concrete Sequential students.

For CS students, the control group mean was 57.52 (*SD* = 8.67) and the experimental group mean was 56.78 (*SD* = 9.21). Analysis of Covariance indicated no main effect for group ($F_{(1, 170)}$ = .186, p = .667) while controlling for pre-test score (see Table 6). Therefore, the null hypothesis (Ho_1) was not rejected.

Table 6
Analysis of Covariance of Post-test Scores for Concrete Sequential Students

Source	*df*	*F*	*p*	η^2
Intercept	1	451.460	.000	.726
Pre-test	1	10.511	.001	.058
Group	1	.186	.667	.001
Error	170			
Total	173			

Ho_2: There is no difference between groups in achievement for Concrete Random students.

In the control group, the mean post-test score for CR students was 55.25 (*SD* = 8.77), while a mean of 56.78 (*SD* = 8.81) was observed for the experimental group. No main effect for group ($F_{(1, 120)}$ = .853, p = .357) was detected through Analysis of Covariance (see Table 7). As such, the null hypothesis (Ho_2) was not rejected.

Table 7
Analysis of Covariance of Post-test Scores for Concrete Random Students

Source	*df*	*F*	*p*	η^2
Intercept	1	461.949	.000	.794
Pre-test	1	8.170	.005	.064
Group	1	.853	.357	.007
Error	120			
Total	123			

Ho_3: There is no difference between groups in achievement for Abstract Sequential students.

For AS students, the control group exhibited a mean of 56.07 (*SD* = 8.13) and the experimental group exhibited a mean of 55.86 (*SD* = 8.50). As seen in Table 8, Analysis of Covariance indicated no main effect for group ($F_{(1, 69)}$ = .071, p = .791). Consequently, the null hypothesis (Ho_3) was not rejected.

Table 8
Analysis of Covariance of Post-test Scores for Abstract Sequential Students

Source	df	**F**	*p*	η^2
Intercept	1	295.032	.000	.810
Pre-test	1	8.526	.005	.110
Group	1	.071	.791	.001
Error	69			
Total	72			

Ho$_4$: There is no difference between groups in achievement for Abstract Random students.

Examination of AR students yielded a mean of 57.67 (SD = 8.54) for the control group and 54.52 (SD = 7.93) for the experimental group. Analysis of Covariance indicated a main effect for group ($F_{(1,\ 125)}$ = 6.357, p = .013), thus indicating a statistical difference in post-test means between the two groups (see Table 9). Accordingly, the null hypothesis (Ho$_4$) was rejected. AR students in the control group scored nearly 6% higher than AR students in the experimental group. However, only a small effect size (η_p^2 = .048) was observed (Cohen, 1988).

Table 9
Analysis of Covariance of Post-test Scores for Abstract Random Students

Source	*df*	*F*	*p*	η^2
Intercept	1	476.918	.000	.792
Pre-test	1	5.669	.019	.043
Group	1	6.357	.013	.048
Error	125			
Total	128			

Conclusions, Discussion, and Implications

Readers are cautioned that without random assignment, conclusions drawn are only applicable to the sample. Based on the results of this study, we can conclude CS, CR, and AS students do not differ in achievement based on the level of their experience with content. We can, however, conclude that AR students achieve at a slightly higher level (although not practical) when they experience content in a more concrete fashion, particularly when that experience involves interaction with the instructor and other students.

These conclusions provide a basis for discussion. Previous research was inconclusive of the influence of learning style on achievement. For CS, CR, and AS learners, the current study was in concordance with those showing no difference (Day, Raven, & Newman, 1998; Freeman, 1995). Theory purports that AR learners prefer interactive, socially dynamic learning environments (Gregorc, 1982a). Affirming theory, the results of this study suggest providing a more socially interactive experience for AR learners will increase their achievement. This assertion aligns with the findings of Marrison and Frick (1994) who found that field-dependent learners preferred a more socially dynamic environment by requesting the sound be added to textual representations in the “multimedia” approach.

The conclusions of this study imply that with this group of students that experiencing the content concretely in a face-to-face format and abstractly through representations delivered online can be equally effective, although AR students did slightly better in the more concrete face-to-face group. Thus, continuation of this delivery method as a means of efficiently delivering the content of this course is recommended.

Although not provocative, this study suggests that some learning experiences may be better suited for some students and that selecting appropriate experiences for students is important for learning. However, further research is needed to determine which types of experiences are best suited for which people. Why can some people learn from watching someone else, while others must practice over and over to achieve even limited proficiency? Why can the same person learn some information by watching others, but can never master other information, even with extensive practice? Why can some people learn by reading a book while others require more concrete experiences? Which content can be effectively presented in abstract forms? Which content is best learned through concrete experience?

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A COMPARISON OF COMMONWEALTH ACCOUNTABILITY STANDARDIZED TEST SCORES BETWEEN HIGH SCHOOL AGRICULTURAL EDUCATION / CAREER AND TECHNICAL EDUCATION STUDENTS AND THE KENTUCKY STATE STANDARDS

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Abstract

Throughout the history of education, assessment has been a crucial part of the teaching process. Various forms of assessment can "affect decisions about grades, advancement, placement, instructional needs, and curriculum" (Dietel, 1991). *In Kentucky, the Board of Education designed the Commonwealth Accountability Testing System, or CATS, to assess its school programs. Each school has its own performance goal for every two-year period, ending in 2014. By 2014, the Board of Education hopes every school will receive a score of at least 100 out of 140.*

While scores can be evaluated by grade, they can also be evaluated by a number of other divisions, such as academic program. Scores in various areas can vary greatly depending on the student's curriculum choice. For example, students enrolled in an agriculture program may fare differently than those enrolled in communication classes in the areas of science, reading or mathematics. A study of these varying scores will not only improve student interest in certain educational programs, but also spotlight programs that may need assistance in reformatting curriculum or teaching styles.

Through a look at the CATS scores of Kentucky's high schools in 2003, the overall scores of agriculture students compared to those of non-agriculture students may suggest the influence agricultural education has on the CATS test. By evaluating these scores by educational program, the CATS tests can be used to evaluate not just the curriculum of the subjects being tested over, but also the programs that contribute to learning these subjects. Through this evaluation, Kentucky's standardized tests can be used to their fullest potential by assessing curriculum and teaching styles, and in turn aiding in the advancement of education.

Introduction

In today's growing world, education is changing at an ever-quickening rate due to constant advancements in technology and science, as well as other academic fields (Newman, 1998). Officials realize that in order for our students to remain on the cutting-edge of learning, schools must be able to adapt curriculum to the changing times. In order for schools, states, and the entire nation to determine whether students are effectively learning the most up-to-date material, a form of assessment must be used to evaluate what each child has learned.

While there are several forms of assessment, norm-referenced assessment, such as standardized testing, allows student knowledge to be compared at the individual, grade, school, state, and national levels. Today, the United States government allows each state to create its own form of norm-referenced assessment to compare students and curriculum. In Kentucky, the Commonwealth Accountability Testing System, or CATS, is a form of norm-referenced assessment that has been in place since 1992 (White, 1998). It provides reliable scores that can be compared between schools so Kentucky can accurately and effectively evaluate not only individual student progress, but also the efficiency of teaching practices and relevance of curriculum in various subjects (Kentucky Department of Education, 2002). Today, Kentucky high schools provide many career and technical education programs for students, including agricultural education.

Historically, agricultural education has been a popular and well-rounded curriculum that teaches the basics of various other subjects through agriculture rules, procedures, and concepts (Shinn et al., 2003). 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 (as cited in Shinn et al., 2003).

The effects of agricultural education's teaching methods and curriculum on high school students is difficult to determine because much of the performed assessment in the program is authentic, allowing students to be graded on portfolios, projects, and other performance-based assessment. Additionally, little research has been gathered on how agricultural education students fare on norm-referenced tests, such as the CATS test. However, by comparing the CATS scores of high school agriculture students to those of non-agriculture students and to the Kentucky state averages, one can determine how high school agriculture students fare on the standardized test overall compared to these other groups of students.

First, a review of literature regarding the advantages and disadvantages of standardized tests and the particulars of the CATS test is necessary in order to fully understand how the CATS test is a valid measurement in the evaluation of high school students. Additionally, a brief history of agricultural education is included to display how this subject area differs from other high school subject areas, and why the teaching practices and curriculum of agricultural education may affect CATS scores.

Theoretical Framework

Assessment in today's school system holds many purposes for various groups of individuals (Dietel, Herman & Knuth, 1991). Policymakers use assessment to set standards and monitor education quality. School administrators use assessment to plan and improve programs, while teachers utilize it to observe student progress. Additionally, parents and students use assessment to determine student strengths and weaknesses. While no one form of assessment can accurately measure a student's ability, the standardized test is a popular method of evaluating students, and proves useful for each of the latter groups (Postman, 2001).

While standardized testing is widely used for evaluating students and curriculum, it is a very controversial form of assessment. In an article entitled *Issues in High Stakes Testing Programs*, Finbarr Sloane (2003) identifies several negative effects of standardized testing on students. First, he claims that these lengthy tests frustrate students and discourage them from trying. Additionally, the fact that norm-referenced tests compare students also makes these students more competitive. Critics claim that because these tests focus on recall, they have led to a narrowing of curriculum and an emphasis on simple memorization with limited opportunity to practice higher-order thinking skills (Dietel et al., 1991). Standardized tests are timed and contain only one answer for each question, leading teachers to ask questions requiring exceptionally short responses and encourage students to select the best answer rather than developing their own questions and answers, again discouraging higher-level thinking. Essentially, critics are worried that teachers will "teach the test" rather than teach a broad range of topics, some of which may show up on the test (wikipedia, 2004).

With all of these harsh criticisms, one may wonder if standardized tests are actually appropriate measures for evaluating student knowledge. Fortunately, there are many advantages associated with standardized tests, making them very beneficial. While standardized tests may frustrate students by confronting them with difficult questions, they also provide these students with information about their individual knowledge and skills (Sloane, 2003). These tests also send clear signals about what to study. In addition, competitive students are motivated by these tests to work harder in school. When compared with teacher-created tests, standardized tests are more reliable and valid (wikipedia, 2004). Contrary to popular belief, it may be very difficult for teachers to teach tests because many standardized tests have several forms, making it impossible for a teacher to know the test's content. Finally, cost proves to be the biggest benefit accredited to standardized testing.

Caroline Hoxby, a professor of economics at Harvard University, created an example in her essay, *Conversion of a Standardized Test Skeptic*, to illustrate how cheap standardized testing is. She claims that with the money that is spent per student on standardized testing annually, teacher salaries could be raised by one quarter of a percent, classes could be reduced by two one-thousandths of a student, or the school year could be lengthened by one-tenth of one day. Each of these options is incredibly inefficient for improving student learning when compared with the benefits of standardized testing. Standardized tests may not be problem-free, but they are one of the cheapest and most reliable ways to evaluate students on the state level.

In Kentucky, the CATS test has been the required form of standardized testing for the past five years, being introduced to students in the spring of 1999 (Kentucky Department of Education, 2002). The CATS test is a very useful form of assessment, in that it is designed for both state and national comparison. This test was created through a broad, collaborative process that includes ideas from a group of 8,000 teachers, principals, superintendents, parents, guardians, community and business leaders, legislators, and other citizens. This group of professionals determined that high school students should be tested in the subjects of science, mathematics, writing on demand, writing portfolios, reading, social studies, arts and humanities, and practical living and vocational studies. Today, a formal advisory council, a panel of testing experts, and a designated legislative committee continue to advise the state board. After completion of the ten-day CATS testing period each spring, students' work in every tested subject is labeled as novice, apprentice, proficient, or distinguished, which is the highest score. To ensure fair and accurate scoring, Kentucky teachers completed descriptions for these scores in every subject and grade level. In addition to a conglomeration of student academic scores, schools also receive scores regarding non-academic issues including student retention rate, dropout rate, and the percentage of graduates that continue their education in college. By combining nonacademic and academic scores, each school receives a single score between zero and 140 points.

The Kentucky Department of Education requires that every school have its own individualized goal every two years until the year 2014. By the end of the goal outlines, Kentucky expects every school to reach a score of at least 100, which is considered proficient. Depending on whether a school scores higher or lower than its goal, the school will either receive assistance or financial rewards.

Because the job market is constantly expanding and adapting to new technology, Kentucky schools have added several career and technical education majors to their high school programs. Among those is agricultural education. The mission of this unique program is to "[prepare] students for the successful careers and a lifetime of informed choices in the global agriculture, food, fiber, and natural resources systems" (Gill, 2003). By combining classroom instruction, involvement in the FFA (formerly known as the Future Farmers of America), and supervised agricultural experiences, enrolling in agricultural education can be the highlight of one's high school career. Additionally, students can learn the basics of other academic programs through applications in agriculture classes. According to G.C. Shinn et al. (2003), authors of *Improving Student Achievement in Mathematics: An Important Role for Secondary Agricultural Education in the 21st Century*, "secondary agricultural education, through the use of relevant curriculum delivered from a student-centered perspective by skillful teachers, has high potential for engaging students in active, hands-on/minds-on learning environments rich with opportunities for learning mathematics" (2003).

While agricultural education appears to have very different teaching techniques from many other academic programs, theory and performance-based assessment do little to confirm that these differences have an affect on student learning. By comparing the scores of high school agriculture students on the CATS test in 2003 to those of other career and technical education majors and to the Kentucky state averages, the effects of the agricultural education curriculum and teaching styles on CATS scores may be evaluated.

Purposes and Objectives

In order to determine if a difference exists in performance level on the CATS tests between agricultural education majors and all career and technical education majors, as well as agricultural education majors compared to Kentucky's state standard, this study contains two purposes:

1. To compare the performance of high school career and technical education majors on the CATS test in 2003.

2. To compare the performance of agricultural education majors to Kentucky state standards on the CATS test in 2003.

In an effort to complete these two purposes, the following three objectives were established:

1. To compare the performance of all career and technical education majors in reading, science, on demand writing, a writing portfolio, math, social studies, arts and humanities, and vocational studies.
2. To compare the performance of agricultural education majors to the other career and technical education majors in each previously mentioned assessment subject.
3. To compare the performance of agricultural education majors to the Kentucky state academic index for all Kentucky high school CATS takers in 2003.

Procedures

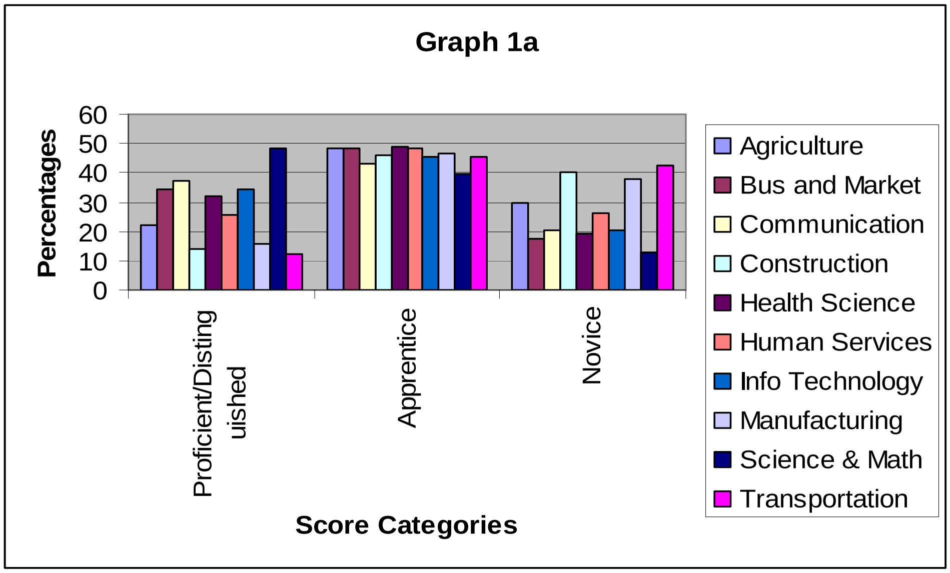
To complete this study, the 2003 scores of CATS tests from 2275 Kentucky high school agricultural education students were compared to Kentucky's 2003 state averages, compiled from Kentucky's 45,676 high school students. Additionally, a copy of Kentucky's CATS scores of high school career and technical education students for 2003 was obtained from the Kentucky State Department of Education. The scores were broken down by career and technical education major and score category in a Microsoft Excel file. Further, Kentucky state high school overall result averages of the CATS test for 2003 from the Kentucky Department of Education website were obtained.

By comparing the percentages of scores in the score categories of distinguished, proficient, apprentice, and novice between agricultural education majors and other career and technical education majors, it can be determined how agricultural education majors performed on the CATS test compared to the other career and technical education majors in 2003. With the overall state scores, the difference between state standards and agricultural education scores can be determined.

Findings

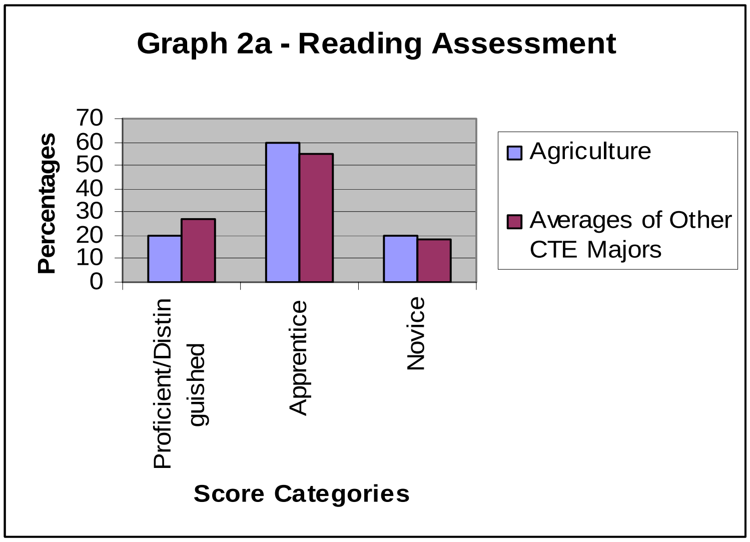
In order to complete each of the three objectives defined above, the graphs below are split into three categories to coincide with the objective they satisfy. Graph 1 compares the performance of all career and technical education majors on the CATS test.

Graph 1 compares the overall performance of each career and technical education major on the CATS test in 2003. Science and math has the highest percentage of students scoring in the categories of proficient and distinguished, while transportation has the fewest number of students scoring similarly. Additionally, transportation has the highest number of students scoring in the novice category, while very few science and math students scored below apprentice. Because by 2014 the Kentucky Department of Education expects all students to score in the category of proficient or distinguished, this graph concludes that science and math is the subject most likely to reach this goal. Further, the graph shows that the areas of transportation, construction, and manufacturing all need to make great improvements in their students' scores in order to meet the 2014 goal. The remaining subjects appear to fall somewhere between science and math and transportation, implying that while scores need to be improved, they are not yet producing scores that should cause great alarm to analysts of the CATS test.

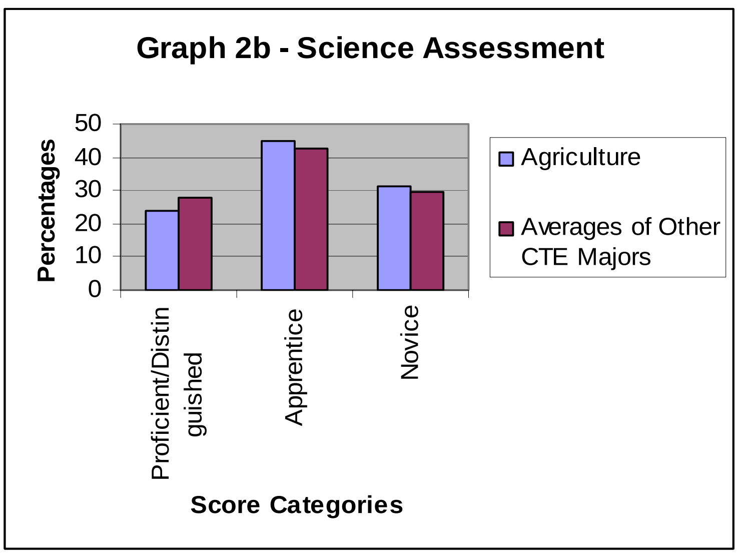


Graph Set 2 compares agriculture students to students in all other career and technical education majors in each assessment area. In the following graphs, agriculture scores are compared to the average scores of all other career and technical education majors in each score category. With regard to scores in each assessment, high school agriculture majors are considered below average. This major does not display proficient and distinguished scores that are severely below those of the other career and technical education majors, but the scores are nevertheless below satisfactory.

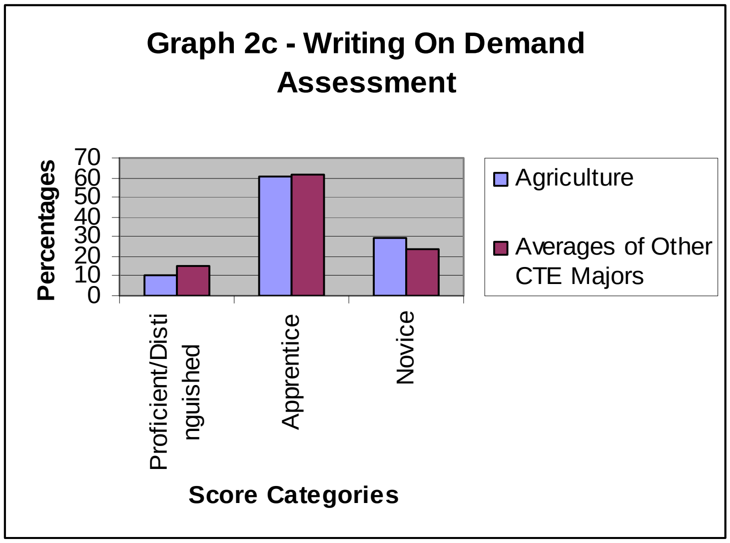
Graph 2a shows the difference in scores between agriculture and other career and technical education majors in Reading. The graph displays that the average of the other career and technical education majors is higher in proficient and distinguished than agriculture. Additionally, more agriculture students score in the novice category than the average of the other career and technical education majors. This shows that agriculture is below average in Reading, when compared to the other career and technical education majors.



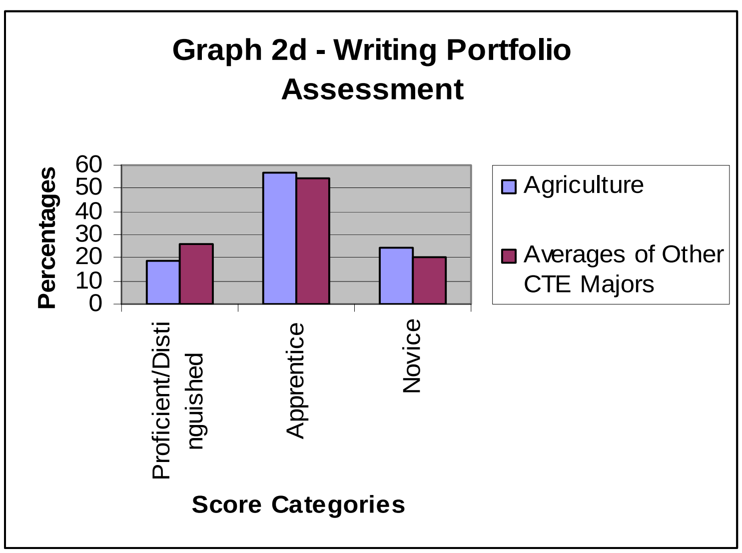
Graph 2b displays the scores of agriculture students compared to those of other career and technical education majors in the assessment area of Science. According to the graph, fewer agriculture students scored proficient and distinguished than the average of the other career and technical education majors. Additionally, slightly more agriculture students scored novice than the average of all the novice scorers from each career and technical education major. This indicates that agriculture must improve more scores than other career and technical education majors to meet the 2014 goal.



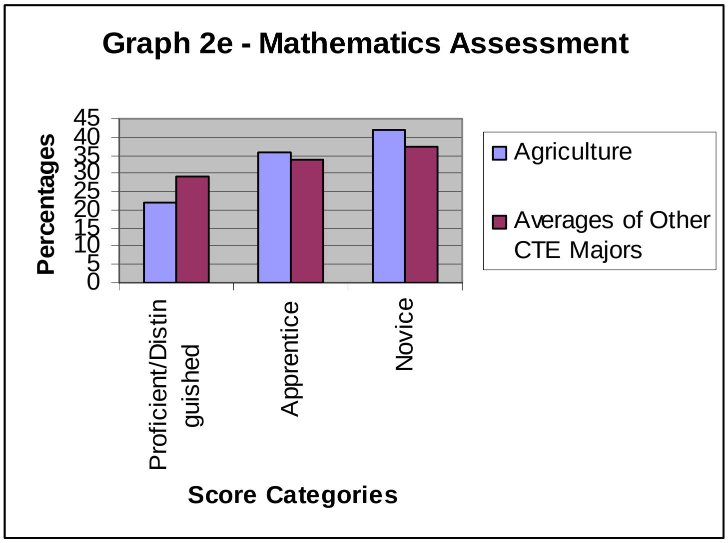
Writing On Demand scores are evaluated in Graph 2c. While fewer students from both agriculture and other career and technical education majors scored proficient or distinguished than on previous assessment subjects, agriculture students still have a lower proficient and distinguished score percentage than the average of all the other career and technical education majors. While apprentice score percentages are very close, agriculture has more students that score novice, concluding that the scores of agriculture students are below the averages of other career and technical education majors.



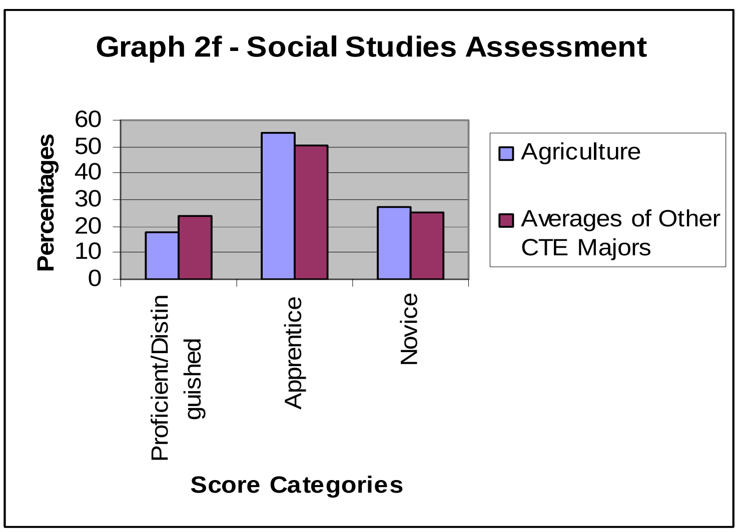
Graph 2d compares the score percentages between agriculture and other career and technical education majors on the Writing Portfolio. Once again, the average of the proficient and distinguished scores from the other career and technical education majors is higher than agriculture's percentage of proficient and distinguished scores. This, along with agriculture's higher novice percentage, implies that agriculture is below average compared to other career and technical majors in the Writing Portfolio Assessment.



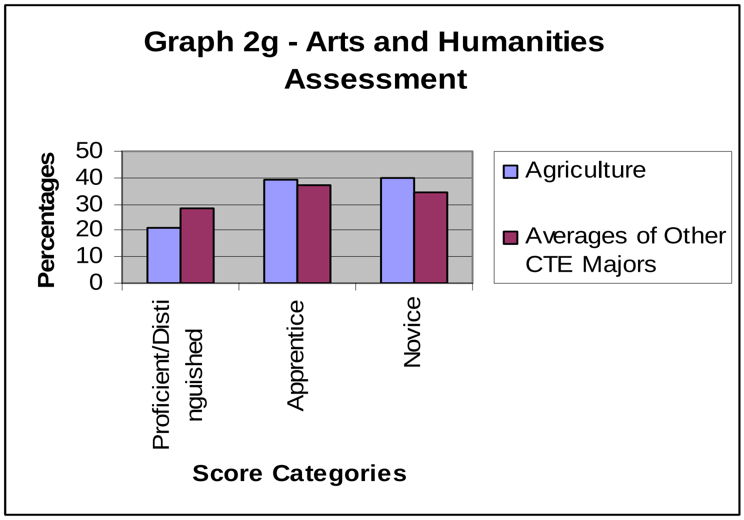
Graph 2e displays score percentages of agriculture and other career and technical education major students in Mathematics. While the overall high novice percentages from both parties indicate that Math is an area all career and technical education majors need improvement in, agriculture is still below the competitor's average. Agriculture's lower proficient and distinguished score and higher novice score proves this.



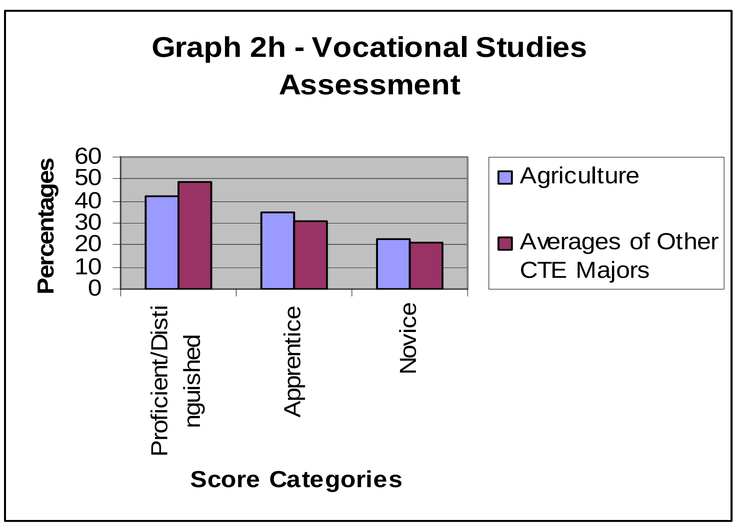
Unlike the Mathematics assessment in Graph 2e, Graph 2f displays the bell curve expected in norm-referenced assessment. This graph looks at scores between agriculture and other career and technical education majors in Social Studies. Similar to other assessment subjects, agriculture scores are higher in novice and lower in proficient and distinguished than the averages of the other career and technical education majors. This shows that agriculture is below the average of the career and technical education majors in Social Studies.



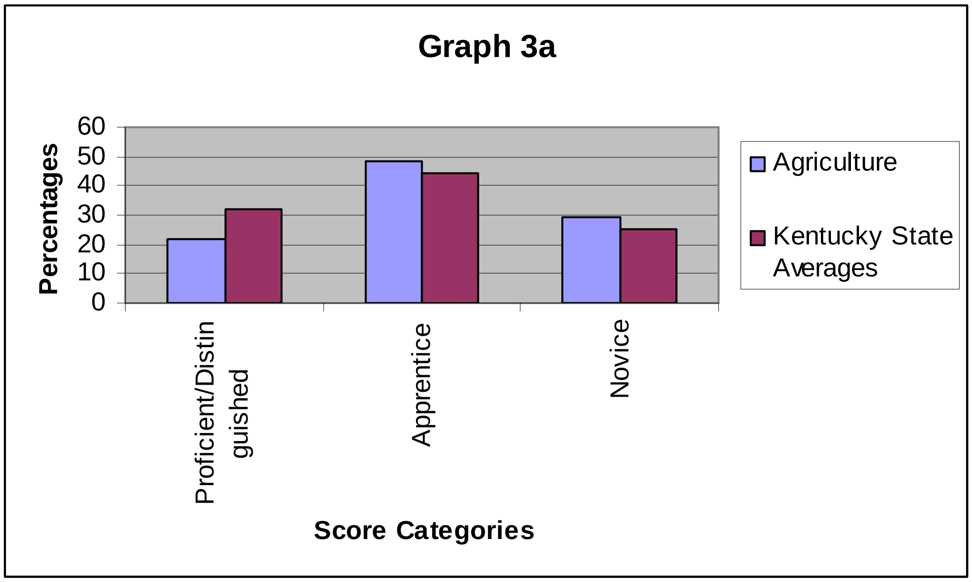
An assessment of Arts and Humanities is looked at in Graph 2g. While the graph displays that all career and technical education majors need improvement in this subject, agriculture has higher novice scores and lower proficient and distinguished scores than the averages of the other career and technical education majors. These differences in scores show that scores of agriculture students in Arts and Humanities are below average compared to other career and technical education majors.



Graph 2h looks at the assessment of Practical Living and Vocational Studies. While the percent of proficient and distinguished scores is higher in all career and technical education majors compared to other assessment subjects, agriculture is still behind the averages of the other majors because of agriculture's lower proficient and distinguished score percentage and higher novice percentage.



Graph 3a compares score percentages of agriculture students to Kentucky's state averages on the 2003 CATS test. As the graph displays, Kentucky averages in proficient and distinguished are higher than those of agriculture majors. These, in addition to Kentucky's lower novice averages, conclude that the scores of high school agriculture majors are below the state standards.



Conclusions

After evaluating the differences in various CATS score averages, several conclusions can be gathered with regard to the previously mentioned objectives of this study. After comparing the performance of high school career and technical education majors on the CATS test in 2003, certain majors stand out as opposite ends of the assessment spectrum.

By evaluating Graph 1a, the major that displays the highest ability on the CATS test is easy to determine. Science and math students display the greatest score averages overall, having both the highest proficient and distinguished score percentage and the lowest novice score percentage. The CATS test has proven that science and math programs need little reform. The three majors most in need raising CATS test scores are transportation, construction, and manufacturing. These majors fall short of the other seven career and technical education majors both in their proficient and distinguished score average and their novice score average.

While this study looks at all career and technical education majors, it focuses primarily on agricultural education. Graph Set 2 shows that, with regard to CATS test scores, high school agriculture majors fall short of the score averages of other career and technical education majors. Unfortunately, comparing agricultural education scores with Kentucky state averages in Graph 3a paints a similar picture. Kentucky's proficient and distinguished score average is higher than that of agriculture, showing that many non-agriculture students score higher than agriculture students on the CATS test.

Recommendations

After looking at the results of this study, it seems as though the unique teaching methods applied in agricultural education may not be enough to meet CATS test goals. However, before any conclusions can be drawn on whether or not some assistance should be offered, a few questions need to be answered. First, are there other factors that may lead to these lower scores, other than the curriculum and teaching methods? What are the IQs and GPAs of the students entering agricultural education? Perhaps these scores are an improvement from those of previous years. If so, the educators and students in agricultural education should be commended for their efforts. Additionally, score percentages may be skewed if certain majors are not offered in many schools, if students incorrectly state their major, or if students are placed in a certain major because of their grades. A further look into these career and technical education majors may prove that agricultural education scores are not as poor as this study implies.

Discussions and Implications

Obviously, this study is merely a starting point in what could be a more definitive idea of how career and technical education majors, and more specifically agricultural education, may influence the learning of high school students. Through additional research in the IQs and study habits of agricultural education students, agricultural education curriculum, and common teaching methods, educators can discover more about how students learn and retain knowledge. Additionally, a continuation of this research may help to reveal which specific teaching practices can help students learn and retain more information. After agriculture students' 2003 CATS scores, agricultural educators should make it a priority to raise the standards and expectations they hold their students to. Improvement can begin with agriculture teachers in the form of varied teaching styles, greater commitment to teach all students, and higher expectations of these students. While improving educational quality in the classroom is not the only answer to raising Kentucky's agriculture students' CATS test scores, it is a reasonable and realistic place to begin. Perhaps in future years, additional investigations will be able to determine how valuable career and technical education programs are in today's schools, and continue to expand the educational horizons of America's students.

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COLLEGE OF AGRICULTURE FACULTY PERSPECTIVES IN THEIR ROLE AS ADVISOR AND MENTOR

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Abstract

Advising has proved to be a key part of each student's educational success. However, faculty expectations for advising students have created problems in the higher education community. The purpose of this study was to compare the attitudes, needs, level of competence, and level of training in advising as perceived by faculty at the University of Kentucky. Results showed that faculty would prefer the number of students advised and the advisement of student organizations to be represented in the teaching appointments. However, faculty believed they were not provided enough time to adequately advise students and that advising was not a valued component of promotion and tenure. Faculty felt most competent in communicating with students and assisting with their schedules. They also felt competent in the use of online advising tools and preferred students utilize this rather than a traditional walk-in schedule. Areas where faculty felt least competent included assisting students with financial aid and legal issues concerning advising. Faculty rarely sought out training, however few times training did occur, several methods were employed. The most important role as an advisor for undergraduates was perceived to be assisting students with their degree program, while as a graduate student advisor faculty perceived research as most important. Recommendations included increasing online advising tools and the allowance of time, resources, and a DOE system for faculty to adequately advise students and be rewarded for it. Regarding training of advisors, advising sessions should be included as a component of the university new faculty orientation or a special college session for new faculty. Lastly, a mentoring program should be implemented for new faculty specifically targeted at advising both undergraduate and graduate students.

Introduction

Academic advising is an on-going, active process involving the student, advisor, and institution (Stull, 1997). Woodbury (1999) suggested that advising provides an opportunity for teaching and learning to occur that is no less important to student success than through the traditional curricula and classroom. The primary goal is to assist students in the development and accomplishment of meaningful educational plans that are compatible with their life goals. Therefore, advising students is truly a key and integral part of each student's educational experience (Fiddler & Alicea, 1996).

The extent to which teaching faculty should be expected to advise students continues to create rifts in the higher education community. This often can be an overwhelming task for new faculty, or one who has no formal training in advising students. Perhaps partly because of self-perceived inadequacy in advising knowledge, many faculty focus on expertise in research and teaching in the most limiting of contexts (Hancock, 1996). Yet, Boyer (1990) clearly expanded the definition of the scholarship of teaching to include such activities as the advisement of students. Prior to Boyer's work, Crookston (1972) also broke new ground when he clearly stated that advising is a form of teaching. However most faculty do not see participation in activities in the teaching and service areas being rewarded by their administration (Boyer, 1990). Dillon and Fisher (2000) stated in their evaluation of faculty advising that many faculty do not feel that the advising load is considered in promotion and tenure decisions.

Some may feel that student advising may be better left to staff designated specifically for this task and not faculty members. However, Hemwall and Trachte (1999) found faculty appropriate to use as academic advisors. Miller and Alberts (1994) stated faculty members are in an excellent position to learn why students want to take a course or instructor and to involve the student in the curriculum. In addition, students feel that personal interaction with faculty has a positive influence on their overall experience at an institution (Kennedy, Gordon, & Gordon, 1995).

The results of expecting unprepared faculty to advise students can be devastating to an institution and its instructional programs. Kennedy, Gordon, and Gordon (1995) stated that faculty/student interaction plays a significant role in student attitudes towards their college experience. Tinto (1993) reported more students actually leave college before completing a degree than stay and graduate. Habley (1993) also noted that advising contributes to overall student success. He further stated that faculty and administrators "recognize that students who formulate a sound educational/career plan based on their values, interests, and abilities will have an increased chance for academic success, satisfaction and persistence. Academic advising remains the most significant mechanism available on most college and university campuses for aiding and abetting this important process" (p.1).

The impact of advising goes beyond that of student academic progress. It influences areas such as student retention, institution fiscal stability, and faculty perceptions (Gleennen, et al, 1996; Stowe, 1996). A number of studies have identified advising as a frequent source of dissatisfaction among students, which is directly related to retention (Corts, Lounsbury, & Saudargas, 2000). Because more students leave college prior to graduation (Tinto, 1993), the loss of students translates into a substantial monetary loss by colleges of agriculture across the nation. Dyer, Lacey, and Osborne (1996) reported an 11 million-dollar loss at one institution because of student attrition. Glennen, Farren, and Vowell (1996) noted that proper academic advising could improve the fiscal stability of institutions by increasing graduation rates.

One method to improve a person's ability to advise is improving motivation through providing professional development (Mager, 1992; Petress, 1996). Petress (1996) identified four major factors that affect a faculty member's self-perceptions of his or her ability to advise: 1) how advisors interpret their advising role, 2) training and/or guidance that is provided to advisors, 3) expectations of administrators and colleagues for advisors, and 4) recognition or rewards available for competent or exemplary advising.

These important professional development opportunities are not often available to faculty. There is a mistaken belief that faculty can learn all they need to know about academic advising through their own experiences as a student (Selke & Wong, 1993). Gordon & Habley

(2000) reported that only one-third of colleges and universities provide any type of professional development activities for advisors. Therefore, examining opportunities for faculty professional development and their perceptions of advising is important.

Theoretical/Conceptual Framework

Bandura's social-cognitive theory as adapted by Mager (1992) serves as the theoretical framework for this study. Mager noted four conditions must be present in order for a person to successfully perform a task: skill, opportunity, a supportive environment, and self-efficacy. The university setting can provide the first three conditions. The fourth component, self-efficacy, is supported by the faculty member. Mager noted that a person's self-efficacy can be improved through completion of tasks. As adapted to this study, when faculty feel they are adequately prepared to advise students, their levels of self-efficacy increase. By contrast, if the advisor feels inadequately prepared, it is likely that this lower level of self-efficacy will manifest itself in less favorable attitudes toward advising, and eventually in lower performance of task.

Purpose and Objectives

The purpose of this study was to compare the attitudes, needs, and level of competence in advising as perceived by faculty at a land grant institution at the University of Kentucky. The following objectives accomplished this purpose:

1. Define advising in terms of rewards and time commitments.
2. Identify attitudes/perceptions of faculty toward student advising.
3. Examine faculty perspectives on the competence/preparation level in advising students.
4. Determine training available to faculty on how to advise students in different areas.
5. Identify advising roles faculty perceive to be most important.

Procedures

This study used a descriptive research design. The population for this study was 65 faculty members in a land grant university college of agriculture. Names and contact information were obtained from office of the College Associate Academic Programs. Data were collected from a census of the population. The instrument used was developed by Myers & Dyer (2000) and used with their permission. It was constructed to assess the attitudes, needs, and perceptions of faculty members. Respondents were mailed an attitudinal questionnaire that used a four-point Likert scale (1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree) to assess their attitudes. A four point scale was used to compel the respondent to express an opinion about the statement. Dillman (2000) noted that it is providing attitudinal questions without giving the option of a neutral statement. Additionally, each question was stated generally enough that all faculty serving as advisors would have adequate knowledge on the subject to form an opinion. Open-ended and short-answer questions were used to gather demographic information.

Face and content validity was established using a panel of experts. Current faculty and administrators at two land-grant institutions examined the instrument for face and content validity prior to implementing the study. Few modifications were made focusing the instrument to meet specific topics pertaining to this university. The instrument was pilot tested using individuals similar to those in the sample, and the coefficient of internal consistency was established at r=.94 using the Spearman-Brown test for reliability. Reliability for the individual constructs of "Value of Advising", "Attitudes/Perceptions Regarding Advising," and "Perceived Knowledge and Preparation for Advising" was determined using Chronbach's alpha. Reliability coefficients for each of these constructs were calculated at .68, .68, and .88, respectfully.

In an attempt to get as much input as possible and reduce non-response error, a total of six contacts were made (Dillman, 2000). These included a pre-study electronic mail contact, instrument mailings, and reminders via both electronic and land mail. Fifty-one faculty members returned questionnaires with a response rate of 78.5%. No differences were found between early and late respondants. Data were analyzed using SPSS software. Frequencies, standard deviations, percentages, and means were calculated for individual questions. Although by definition Likert-type scales produce ordinal data, results were treated as interval data for analysis and interpretation purposes. This procedure is commonly accepted in social science research, especially if data are categorized into equal intervals as was done in this study (Clason & Dormody, 1994).

Findings

Time commitments were expressed through number of advisees served. Faculty reported 22.4 undergraduate advisees and 6.2 graduate student advisees. Faculty met with undergraduate advisees 2.0 times per semester for an average of 33.3 minutes per session. Faculty met with graduate students 8.1 times per semester for an average of 41.1 minutes per session. Faculty also reported spending approximately 8.1 hours per month advising undergraduate students and 12.4 hours per month advising graduate students.

Table 1 defined advising in terms of rewards and time commitments. Faculty felt very strongly that student number advised should be a component the teaching DOE; almost three-fourths (74.0%, n=37) of faculty strongly agreed and 24.0% (n=12) agreed. The same support was given for advising student organizations and teaching DOE allocations. However, the support was slightly less for advising student organizations (48.0% [n=24] strongly agreed, 38% [n=19] agreed). Thirty percent (n=15) agreed and 46.9% (n=23) strongly agreed student advising should be a component of promotion and tenure. Less support was given (26.5% [n=13] strongly agreed, 40.8% [n=20] agreed) for advising student organizations as a component of promotion and tenure.

Table 1
Faculty Definition of Advising in Terms of Rewards and Time Commitments

Area of Advising	*M*	Strongly Disagree [a]		Disagree [a]		Agree [a]		Strongly Agree [a]	
		f	%	*f*	%	*f*	%	*f*	%
The student number advised should be a component of teaching DOE.	3.72	0	0.0	1	2.0	12	24.0	37	74.0
Students should utilize the electronic advising schedule.	3.43	1	2.2	2	4.3	19	41.3	24	52.2
The advising of student organizations should be a component of teaching DOE.	3.34	0	0.0	7	14.0	19	38.0	24	48.0
Student advising should be a component of faculty compensation	3.33	0	0.0	4	8.3	24	50.0	20	41.7
Student advising should be a component of the Promotion and Tenure Review.	3.18	3	6.1	8	16.3	15	30.6	23	46.9
University faculty should be responsible for advising students regardless of pay.	2.79	5	10.6	11	23.4	20	42.6	11	23.4
Advising student organizations should be a component of promotion and tenure review.	2.68	4	8.2	12	24.5	20	40.8	13	26.5
The quality of student advising as determined by student advising evaluations should be component of faculty pay scale.	2.61	3	6.1	19	38.8	21	42.9	6	12.2
Faculty are provided with enough time to adequately advise students.	2.27	15	29.4	12	23.5	19	37.3	5	9.8
Student advising is currently a valued component for the Promotion and Tenure review.	1.92	16	32.7	23	46.9	8	16.3	2	4.1
Students should utilize advising sessions with faculty on a walk-in basis.	2.16	9	18.4	24	49.0	15	30.6	1	2.0
Advising student organizations is currently a valued component of promotion and tenure review.	1.86	16	32.7	20	51.0	7	14.3	1	2.0
Only faculty with teaching appointments should advise student organizations.	1.78	19	38.8	24	49.0	4	8.2	2	4.1

[a] Means categorized as: Strongly Disagree (M=1.00), Disagree (M=2.00), Agree (M=3.00), Strongly Agree(M=4.00).

Few (20.4% [n=10] agreed or strongly agreed) viewed student advising is a valued component of the promotion and tenure review, while a total of 79.6% (n=39) disagreed or strongly disagreed with the statement. Few faculty agreed (16.0%, n=8) serving as a student organization faculty advisor is a valued component of promotion and tenure review.

When asked if students should utilize advising sessions with faculty on a walk-in basis, one-third (32.6%, n=16) of faculty agreed or strongly agreed, while 67.4% (n=33) disagreed or strongly disagreed. In addition, a slight majority (52.9%, n=27) of the faculty disagreed that faculty are provided with enough time to adequately advise students.

Attitudes toward student advising were examined in the second objective (Table 2). Faculty agreed that advising students is an effective way to recruit students (67.3%, n=33), build rapport (100%, n=50), and retain students (93.9%, n=46). Faculty also believed advising graduate students is a scholarly activity (96%, n=47), however a difference existed for undergraduate advising only 55.1% (n=27) agreed with the statement. Value placed on quality advising was examined at each level: department (71.5% agreed, n=35); college (62% agreed, n=31); and university (34% agreed, n=17). Faculty disagreed (17.1%, n=8) with only faculty having teaching appointments should advise graduate students, undergraduate students (46%, n=23) or student organizations (87.8%, n=43).

Faculty perspectives on their advising knowledge and preparation level were identified (Table 3). An overwhelming 98.3% (n=50) of faculty agreed they were comfortable in communicating with students. In regard to assisting students in planning schedules, 97.9% (n=48) of faculty agreed or strongly agreed they were competent. Furthermore, 94.0% (n=47) agreed or strongly agreed they were able to assist students with career choices with 42.0% (n=21) in strong agreement. Pertaining to competence in advising student organizations, 82.0% (n=41) of faculty agreed. However, two faculty (4.0%) strongly disagreed. Forty-four faculty members (69.4%) reported they felt competent in counseling students with personal matters. Regarding using online advising tools, 62% (n=31) of faculty agreed that they were competent in this area. Almost two-thirds (n=30, 60%) disagreed that they felt competent in their knowledge regarding legal issues concerning advising, and 16% (n=8) strongly disagreed with this aspect.

Table 4 displays faculty perceived advising competence levels. Course scheduling was identified as most competent (M=3.48) area. Over half (56.3%) of the respondents felt very competent in assisting students with scheduling courses. Degree and program requirements were perceived as important (M=3.46) and a majority (58.3%) believed they were very competent with this advising responsibility. Faculty split (M=2.42) on advising students with personal issues. Faculty felt least prepared (M=2.17) to assist students with financial assistance opportunities.

The fourth objective examined the training faculty received regarding advisement (see Table 5). Sixty-four percent stated they had received no training on how to advise students on academic and professional matters. Of the 36.0% responding they had training, faculty stated training was received at the college and department levels or they had attended campus workshops.

Table 2
Faculty Attitudes Regarding Advising

Area of Advising	*M*	Strongly Disagree [a]		Disagree [a]		Agree [a]		Strongly Agree [a]	
		f	*%*	*f*	*%*	*f*	*%*	*f*	*%*
Advising students is an effective way to build rapport.	3.62	0	0.0	0	0.0	19	38.0	31	62.0
Advising plays an important role in retaining students.	3.57	1	2.0	2	4.1	14	28.6	32	65.3
Advising Graduate students is a scholarly activity.	3.49	0	0.0	2	4.1	21	42.9	26	53.1
Advising Undergraduate students is a good use of faculty time.	3.39	1	2.0	7	13.7	14	27.5	29	56.9
Advising student organizations is a good use of faculty time.	3.23	0	0.0	7	14.6	23	47.9	18	37.5
Advising plays an important role in recruiting students.	2.90	4	8.2	12	24.5	18	36.7	15	30.6
Quality advising is valued in my department.	2.86	2	4.1	12	24.5	26	53.1	9	18.4
Quality advising is valued in my college.	2.78	4	8.0	15	30.0	19	38.0	12	24.0
Advising Undergraduate students is a scholarly activity.	2.69	5	10.2	17	34.7	15	30.6	12	24.5
Faculty with teaching appts. should advise Undergraduates.	2.48	11	22.0	12	24.0	19	38.0	8	16.0
Quality advising is valued at the University level.	2.12	15	30.0	18	36.0	13	26.0	4	8.0
Only faculty with teaching appts. should advise Graduate students.	1.79	20	42.6	19	40.4	6	12.8	2	4.3
Only faculty with teaching appts. should advise student organizations.	1.78	19	38.8	24	49.0	4	8.2	2	4.1

[a] Means categorized as: Strongly Disagree (M=1.00), Disagree (M=2.00), Agree (M=3.00), Strongly Agree(M=4.00).

Eighty-eight percent had no training on how to advise student organizations with 12.0% stating they had received training. Two respondents stated training occurred at a formal level in their college coursework and through workshops. Several others identified training through more informal pathways such as visiting with other advisors outside of the university, through practice, or through other youth organizations.

Table 3
Faculty Perceived Knowledge and Preparation for Advising

Area of Advising	M	Strongly Disagree [a]		Disagree [a]		Agree [a]		Strongly Agree [a]	
		f	%	*f*	%	*f*	%	*f*	%
Faculty feel comfortable in communicating with students.	3.76	0	0.0	1	2.0	10	19.6	40	78.4
Faculty feel competent in assisting students plan schedules.	3.65	0	0.0	1	2.0	15	30.6	33	67.3
Faculty feel competent in counseling students on career choices.	3.36	0	0.0	3	6.0	26	52.0	21	42.0
Faculty know where to find information on academic policies.	3.33	0	0.0	5	10.2	23	46.9	21	42.9
Faculty are aware of campus resources to assist students who are in academic difficulty.	3.10	0	0.0	12	24.0	21	42.0	17	34.0
Faculty feel competent in advising student organizations.	3.10	2	4.0	7	14.0	25	50.0	16	32.0
Faculty feel competent in counseling students in personal matters.	282	6	12.2	9	18.4	22	44.9	12	24.5
Faculty feel competent in using on-line advising tools.	2.76	6	12.0	13	26.0	18	36.0	13	26.0
Faculty feel competent in knowledge of legal issues concerning advising.	2.36	8	16.0	22	44.0	14	28.0	6	12.0

[a] Means categorized as: Strongly Disagree (M=1.00), Disagree (M=2.00), Agree (M=3.00), Strongly Agree(M=4.00).

Table 4
Faculty Perceived Advising Competence Level

Area of Advising	*M*	Not at all		Somewhat		Competent		Very	
		f	%	*f*	%	*f*	%	*f*	%
Course Scheduling	3.48	0	0.0	4	8.3	17	35.4	27	56.3
Degree/Program Requirements	3.46	0	0.0	6	12.5	14	29.2	28	58.3
Career Counseling	3.10	0	0.0	9	18.8	25	52.1	14	29.2
Industry/Job Market Demands	3.06	0	0.0	10	20.8	25	52.1	13	27.1
Student Organization Advising	2.69	5	10.4	16	33.3	16	33.3	11	22.9
Activities/Competitions	2.60	8	16.7	12	25.0	19	39.6	9	18.8
Personal Issues	2.42	10	20.8	13	27.1	20	41.7	5	10.4
Financial Assistance Opportunities	2.17	14	29.2	16	33.3	14	29.2	4	8.3

Table 5
Training Faculty Received Regarding Student Advisement

Area of Advising	Yes (%)	No (%)
Academic and Professional Matters	36.0	64.0
Student Organizations	12.0	88.0
Personal Matters	20.0	80.0

Faculty advisors were also asked questions regarding training for counseling students on personal matters. Eighty percent said they had received no training in this area. Of the 20.0% who responded yes, training occurred through the university testing/counseling center, workshops, coursework in counseling, or meetings coordinated by the college academic program office.

Important roles for advising undergraduate and graduate students were examined (Table 6). Faculty identified the most important role for advising undergraduate students was assisting with degree and program requirements. Course scheduling and career counseling ranked second and third, respectively. Assisting students with activities and competitions was viewed as the least important role for undergraduate advisors. The role of assisting undergraduate students with research was viewed not applicable by the respondents.

Table 6
Advisor Roles Faculty Perceive to be Important

	Undergraduate		Graduate	
Item	Rank	Index Score[a]	Rank	Index Score[a]
Degree/Program Requirements	1	358	2	328
Course Scheduling	2	341	4	267
Career Counseling	3	309	3	307
Industry/Job Market Demands	4	199	5	240
Personal Issues	5	187	6	161
Scholarship/Aid Counseling	6	161	7	145
Student Organization Advising	7	142	9	62
Activities/Competitions	8	119	8	141
Research	N/A	N/A	1	365

[a] An index score was calculated by reverse coding respondent ranking (e.g., 1 = 8 pts, 2 = 7 pts, etc.) and summing total points received by each item.

For graduate student advising, faculty ranked research as the most important role. Advising graduate students with their degree and program requirements, career counseling, and course scheduling were also viewed as important roles by faculty. Student organization advising was viewed as the least important role of graduate advisors by faculty.

Student Objective four examined the training faculty received regarding student advisement and reflected in Table 4. Sixty-four percent (n=32) stated they had received no training on how to advise students on academic and professional matters. Of the 36.0%

responding they had training, faculty stated training was received at the college and department levels or they had attended campus workshops.

Eighty-eight percent (n=44) had no training to advise student organizations with 12.0% (n=6) stating they did receive training. Two respondents stated training occurred at a formal level in their college coursework and through workshops. Several others identified training through more informal pathways such as visiting with other advisors outside of the university, through practice, or through the other youth organizations.

Faculty advisors were also asked regarding training on counseling students on personal matters. Eighty percent (n=40) said they had received no training in this area. Of the 20% (n=10) who responded yes, training occurred through the university testing/counseling center, workshops, coursework in counseling, or meetings coordinated by the college academic program office.

Conclusions

College of Agriculture faculty believe the number of students advised should be a component of the teaching Distribution of Effort (DOE). Faculty also feel advising student organizations should be represented in the Distribution of Effort (DOE) and faculty with out teaching appointments should not be required to serve as an academic advisor. Faculty members believe they do not have enough time to adequately advise undergraduate and graduate students. In regards to Promotion and Tenure, faculty want student advising to be valued, however advising responsibilities are viewed as not valued in the Promotion and Tenure process. Faculty view the value of student advising to decrease as one ascends the university hierarchy (department chair, college dean, university president).

In examining faculty attitudes on advising issues, faculty believe advising is beneficial in the recruitment, rapport and retention of students. Faculty members consider advising graduate students as a more scholarly activity than advising undergraduates. Assisting students their degree program is the most important role of the undergraduate student advisor, whereas research is the most important role of the graduate student advisor. Serving as a student organization advisor and helping students with activities and competitions are less important roles for both the undergraduate and graduate advisor.

College of Agriculture faculty members are most comfortable in communicating with students and assisting students with their schedules. In addition, they feel they are competent in using on-line advising tools and prefer students to utilize an electronic advising scheduling rather than a traditional walk-in schedule. However, faculty perceive themselves less competent in assisting students with financial aid opportunities, and believe they are least competent in knowledge of legal issues concerning advising.

College of Agriculture faculty members have received no formal training for student advising. However, faculty who had received some form of training sought it out on their own through other university workshops, youth organizations, or through mentorship with other faculty.

Recommendations

The College of Agriculture at the University of Kentucky should continue using faculty as student academic advisors and advisors for student organizations. Electronic advising scheduling is viewed a good resource and preferred by faculty, therefore more on-line tools should be incorporated into advising. Staff and faculty should continue to encourage students to utilize electronic scheduling of appointments.

Faculty members feel they are not provided with enough time to adequately advise students. Therefore, the College of Agriculture should allow time, resources, and a DOE system for faculty to adequately advise students, and be rewarded for it. This could be integrated into a component of the Promotion and Tenure process. Administrators at the department, college and university levels should reinforce the importance and value of advising students and provide leadership.

Faculty should receive formal training in advising – as both an academic advisor and in advising student organizations. This could be included as a component of the university new faculty orientation or a special college session for new faculty. It is also recommended an overview of new curricula and policies be discussed annually by all faculty members serving as academic advisors. Topics discussed could include legal issues for advising students and assisting students with financial aid opportunities.

Mentoring should occur for new faculty, specifically targeted towards advising students. Experienced faculty should be paired with new faculty to adequately meet the needs of those with less experience. Focus should be given especially to new assistant professors who not only may be learning a new system and requirements for graduation, but also learning how to advise students for the very first time. Faculty new to the university must also seek out those experienced advisors and ask questions as needed.

Implications

Selke & Wong (1993) reported it is a mistaken belief that faculty can learn all they need to know about academic advising through their own experiences as a student. Furthermore, only one-third of colleges and universities are reported to provide any type of professional development activities for advisors (Gordon & Habley, 2000). This study provided information to Colleges of Agriculture that they are not exempt or alone. Providing faculty professional development and mentoring is vital to the success of student advising in areas of student/faculty rapport and student retention. Kennedy, Gordon, & Gordon (1995) reported students feel that personal interaction with faculty has a positive influence on their overall experience at an institution. Not only will positive interaction through advising generate student success, it will provide great financial rewards back to the university. Students are an important aspect to faculty, college and university success. Therefore, academic and organizational student advisement should be further investigated and faculty rewarded accordingly.

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FACTORS RELATED TO THE EFFECTIVENESS OF PROGRESS TOWARD DEGREE REGULATIONS

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Abstract

Graduation and time-to-degree rates of students in higher education continue to be an issue of concern for both public and private institutions. This study sought to determine the preliminary results of the progress toward degree regulations for a College 2002 freshmen class (N = 604) who completed their sophomore year of study. The students were divided into two groups - those who had an approved Plan of Study (n=160) and those who did not (n=444). The purpose of this study was to determine if progress toward degree regulations increased retentions rates of undergraduate students in a college of agriculture and to explore characteristics of the students that might be related to student's compliance in developing an approved Plan of Study. Study objectives include: 1. What demographic factors are associated with freshman students completing an approved Plan of Study? and 2. Does having a Plan of Study encourage students' progress toward degree as measured by retention of students, total hours completed and total hours completed toward their degree? Tinto's (1993) interactionist model provides the theoretical framework for this study and postulates that each student possesses an individual set of traits such as sex, race, class rank, ACT or SAT scores that influences their initial commitment to obtaining a degree as well as a desire to obtain a degree. Class percentile was the only characteristic found to be significantly associated with whether a student completes a Plan of Study. Gender, race, and SAT scores were not. Retention was significantly associated with developing a Plan of Study. Specifically, students who had approved plans earned more credit hours, passed more credit hours and had higher GPAs.

Introduction

Graduation and time-to-degree rates of students in higher education continue to be an issue of concern for both public and private institutions. The number of students who complete a bachelor's degree within four years is declining according to national studies (Engle, 2004). This continuing decline hinders the ability of our higher education institutions to provide the opportunity to an ever increasing number of qualified applicants to enter these institutions as well as weakens the financial power of the institution. Students who take longer to graduate also share this financial burden in the form of additional tuition and fewer years of earning potential.

Retention and persistence (continued enrollment) of the student determines whether a student eventually graduates. A plethora of research exists that examines the factors that predict the retention of students in a higher education setting. Most institutions utilize this research to determine formulas used to admit those students who will most likely graduate at the post secondary level. Less research and understanding exists related to factors related to the student's success in completing the degree in four years or less. Garton, Ball and Kitchel (2004) stated that previous research, regarding colleges of agriculture, focused on admission criteria and that little has been done to track students through the degree. Recent studies at our university indicate that only 26 percent of undergraduates graduate in four years, 55 percent within five years and 62 percent within six years of enrolling in a degree program. Within the College of Agriculture and Life Sciences the percentages are much higher with 38.6 percent of the undergraduates completing a degree in four years, 62 percent in five years and 67.5 percent within six years of enrolling in a degree program.

A delay in credit production toward a chosen degree can often be attributed to the fact that many freshmen change their major the first semester. Kramer, Higley, and Olsen, (1994) found that 57% of entering freshmen changed their degree and that many who had changed their major early were students who entered with ”superficial pseudo-plans”. Schein, Laff, and Allen (1987) described the phenomenon called the “Myth of the Academic Major” in their monograph on academic advising. They concluded that most freshmen students may declare a major but they probably do not understand what the major means or what careers the major will lead them toward. They are not capable of proceeding through a series of prescribed courses but are committed to the major.

Dyer, Lacey & Osborne (1996) found that only 40.6% of students in the College of Agriculture at University of Illinois planned to graduate in a major within that college. They concluded that if the College of Agriculture is serving as a transient warehouse then valuable resources are being wasted on these students. Russell (1993) questioned the future of agriculture since fewer youth are enrolling in Colleges of Agriculture. He suggested that institutions need to commit resources to prevent a “brain drain” of the agriculture industry. Institutions must also be accountable to taxpayers and donors who support the Colleges of Agriculture by producing graduates that will pursue a degree and career in their field (Upcraft, Gardner and Associates, 1989).

Several public higher education institutions have adopted and are enforcing “progress toward degree” regulations. The intention of these policies is to increase timely graduation rates by creating interim assessments of “progress toward degree” that track students through their degree program. Some institutions have incorporated contract-like formats that students must pledge to strive for and others have created benchmarks for students related to the numbers of hours they must complete after a certain number of semesters. Several institutions have created an on-line tool that allows students and advisors to work together to lay out an individual semester by semester plan for completion of the degree.

“Progress toward degree” regulations and Plan of Study tools were introduced to retain and speed up the rate of time toward degree beginning with the entering 2002 freshmen at our university. According to our university’s Academic Policies and Regulations (2004), “Upon admission as a degree-seeking student, an undergraduate student is expected to make satisfactory progress in a planned and deliberate way toward graduation. This expectation of satisfactory progress translates into the following University minimum requirements: the development and registering of a Plan of Study that serves as a planning tool for completing degree requirements for the students’ s selected major(s), enrollment in course work consistent with the student’s Plan of Study, continuous full-time enrollment (a minimum of 12 credit hours) during consecutive semesters (i.e., Fall, Spring) until graduation, successful completion of at least 24 credit course work each academic year and matriculation into a degree program by the beginning of classes in the first semester that the student has junior status."

A Plan of Study is an on-line planning tool that requires students to follow a prescribed course of study and determine the semester in which they will complete each course requirement. Their Plan of Study must be completed and approved by their advisor at least one semester prior to the semester they are taking the courses. Each time the student amends the Plan of Study the advisor must approve the Plan of Study electronically. A student is compliant with the Progress Toward Degree Regulation if they satisfy the five requirements in the previous paragraph.

Theoretical /Conceptual Framework

The status of graduation rates continue to reflect a decline of the number of students who complete a degree within four years; however, attrition rates have remained static for the last fifty years according to Moller-Wong, Shelley & Ebbers (1999). Attrition is greatest after the second term of enrollment at the end of the freshmen year when one-third of all students drop out of college and public universities (American College of Testing Program, 1998 & Ronco, S.L., 1994). ACT (2001) reported the percentage of college students who return after their first year of study is slightly increasing but the percentage of undergraduates who complete their degree in less than five years has continued to decrease and is now at 51%. The National Center for Educational Statistic (2003) reported that those completing their first bachelor's degree take 55 months on average to complete a 4-year degree.

Ferguson, Wisner & Discenza (1986) concluded that it cost institutions more to recruit a new student than it does to keep a current one. The more resources an institution spends on instructional and academic support the higher the retention and graduation rates according to a study conducted by Gansemer-Topf and Schuh (2003-2004) at Iowa State University. Glennen, Farren & Vowell (1996) found that quality academic advising improves the fiscal stability of universities by increasing graduation rates. But universities often fail to recognize the value of advising in their instructional mission and often consider cutting allocations that enhance advising opportunities.

Students are most prone to drop out during their first year of college so persistence should be addressed early in the college experience (Tinto, 1993). The sophomore year of study is usually a year of academic reflection. At the end of the sophomore year students are typically clarifying their academic goals (Gordan & Habley, 2000).

Dyer and Breja (1999) stated that retention is often predicted by university admission criteria however they hypothesized that other criteria may be better predicators. Garton, Ball & Kitchel (2004) found high school core grade point average and ACT scores as the best predictors of academic performance in a college of agriculture. They did not find that learning style was a variable that could be used to predict academic obtainment.

Blecher, Micahel, & Hagedorn (2002) found that age, socioeconomic status, ability, educational aspirations, full time attendance, hours worked on a job, scholastic achievement and student involvement all help explain student persistence in a 4 year degree. They also found that student satisfaction levels do not have a direct impact on persistence toward degree. At the University of Iowa, Desjardins, Dong-Ok Kim & Rzonca (2002-2003) found that graduation rates of four years or less were influenced by previous academic success, current academic success at the institution and college major.

The National Center for Education Statistics (1999) found that the percentage of students who completed 30 credits their freshmen year (43 percent) were much more likely to maintain stable credit production throughout their degree. Those that took two years to reach the 30-credit threshold were four times more likely to drop out. They concluded that the number of credits produced the first year was positively related to total credit production, reaching credit thresholds, time to degree, degree attainment, and overall credit production. They also found students at public institutions versus those at private institutions were more likely to take five years for degree completion.

The National Center for Education Statistics (1999) found that first–year credit production, socioeconomic background, first-year grades, test scores, and summer term enrollment are all positively related to credit production while enrollment and that enrollment interruptions and initial part-time enrollment are negatively related. In 2003, The National Center for Education Statistics also found that higher grade point averages of student's at public universities were associated with shorter time toward degree completion and that the higher a parent's education the longer the child took to complete a degree. In 2004, The National Center for Education Statistics found that income, gender, and race made no measurable difference in a student's completion of a 4-year degree.

Retention of students in higher education was identified by the National Academic Advising Association (NACADA) in 1997 as a critical issue in advising. Munsell and Cornwell (1994) stated that the more support a student receives the more successful they are in meeting their goal. Even though the advising community recognizes the relationship between advising and retention most research conducted to study student retention has focused on factors that universities do not have control over such as GPA, socio-economic status, socialization, age, high school performance and gender (Payne et al, 1996 & Schurr et al,1997)

Tinto's (1993) interactionist model provides the theoretical framework for this study and postulates that each student possesses an individual set of traits such as sex, race, class rank, ACT or SAT scores that influences their initial commitment to obtaining a degree as well as a desire to obtain a degree. This commitment influences their level of academic and social interaction that influences their persistence to obtain a degree. Tinto hypothesizes that an initial commitment to the institution will have an affect on the successful integration of the student into the academic and social systems (Blecher, Micahel, & Hagedorn, 2002).

Retention has consistently been found to be dependent on the student's academic and personal needs which require collaborative efforts from advisers, students, faculty and administrators to integrate the student both socially and academically into the University (Bedford & Durkee, 1989). Gordan and Habley states that: "policy and procedures are linked to commitment" p.139 and suggests that policies and procedures be created to encourage student participation.

Provost James L. Oblinger stated in his speech titled "Progress Toward Degree Policy Designed To Help Students Reach Academic Goals" that "while the progress toward degree regulation is designed to improve graduation rates and to help students complete their degrees in a timely manner, its' emphasis on faculty and student interaction in planning should have other long-term benefits". Regulations at our university articulate to students that they must work with their advisor to create and update a Plan of Study, enroll as full-time students each semester and that their academic progress will be reviewed on a regular basis by colleges and academic departments.

Purpose and Objectives

The purpose of this research was to assess the preliminary results of the progress toward degree regulations for the freshmen class of 2002 that have completed their sophomore year of study. More specifically the purpose of this study was to explore characteristics of the students that might be related to student's compliance in developing an approved Plan of Study and to determine if progress toward degree regulations increased retentions rates of undergraduate students in a college of agriculture.

1. What demographic factors are associated with freshman students completing an approved Plan of Study?
2. Does having a Plan of Study encourage students' progress toward degree as measured by retention of students, total GPA, total hours completed and total hours completed toward their degree?

Procedures

The target population in this study was the cohort of students who entered the College of Agriculture and Life Sciences as freshmen in the 2000 fall semester (N=604). For the purpose of the study, the students were divided into two groups—those who had an approved Plan of Study (n=160) and those who had not developed a Plan of Study (n=444). All students in the population were included in this census study.

The dependent variable dealing with the first question of the study was the use of the Plan of Study advising tool. The independent variables were gender, race, high school class percentile, and SAT scores.

The dependent variables dealing with the second question of the study were retention, total grade point average, total credit hours completed and credit hours completed toward the degree after two years of study. The independent variable was the use of the Plan of Study advising tool.

Data sets compiled by the Office of Registration and Records were utilized in the study. Descriptive statistics were used to describe the study population. Data were analyzed using appropriate inferential statistics because the population in this study was assumed to be representative of other cohorts of entering freshmen students in the College of Agriculture and

Life Sciences. Both statistical significance and practical importance were considered in analyzing the findings.

Findings

The majority of College of Agriculture and Life Sciences entering freshmen of fall 2002 students were female and white. In all there were 226 males (37.4%) and 378 (62.6%) females. The racial composition of the class consisted of 498 white (82.5%), 62 African American (10.3%), 27 Asian (4.5%), 9 Native American (1.5%) and 8 Hispanic (1.3%) students. The mean high school class percentile for this group was in the top 13 % of their class and their mean SAT scores as entering freshmen were relatively high at 1167. This class as a whole was successful in the university setting, as they possessed a mean total grade point average of 3.04 after completing 2 years of study at the university.

Differences between gender, race, SAT scores and high school class percentile of those who had an approved Plan of Study (n=160) and those who had not developed a Plan of Study (n=444) were examined using non-parametric and inferential statistics. A Chi-Square test was used to examine whether the gender and race of the student and the development of a plan are associated. The analysis of gender yielded χ^2= 2.9905, df=1 (p>.05) suggested that gender was not associated with students developing a Plan of Study. The analysis of race yielded χ^2= 2.650, df=4 (p> .05) suggested that race is not associated with students developing a Plan of Study.

As seen in Table 1, SAT scores were not found to be associated with student completion of a Plan of Study α < .05. High school class percentile was found to be significantly associated with whether a student completes a Plan of Study.

Table 1
Differences Between CALS 2002 Freshmen Cohort on Selected Characteristics Grouped by The Use of A Plan of Study Advising Tool

	M[1]	*Mean Difference*	*SD*	*t-value*
SAT				
Plan of Study	1172.06		120.43	
		6.98		-.623
No Plan	1165.08		121.61	
High School Class Percentile				
Plan of Study	12.25		10.611	
		2.20		2.055*
No Plan	14.45		11.524	

*α < .05

Non-parametric and inferential statistics were also employed to determine if having a Plan of Study encourages student's progress toward degree. Progress was identified as retention of the student at the university, total grade point average, hours toward degree and total hours passed after two years of study. A Chi-Square test was used to examine whether the retention of the student after two years and the development of a plan were associated. The analysis of retention yielded χ^2= 26.01, df=1 (p=.001) which suggested that developing a Plan of Study and the retention of the student were associated.

As seen in Table 2, a significant difference was found in the credits earned during the first two years of those students who had a Plan of Study and those that did not have a Plan of Study. Students who completed a Plan of Study completed 4.56 more hours during their first two years of study toward their degree than students who did not have a Plan of Study. Students who had a Plan of Study also passed 4.40 more total hours their first two years of study than those who did not have a Plan of Study. These differences represent more than one additional course completed and were considered of practical importance.

Total grade point average after two years at the university setting was also significantly associated with whether a student completed a plan of work. As seen in Table 2, those that completed a Plan of Study possessed a total grade point average .20 points higher than those students who did not have a plan of work.

Table 2
Comparison of Progress Toward Degree of 2002 CALS Freshmen Cohort Who Used the Plan of Study Advising Tool vs. Those Who Did Not Develop a Plan of Study

	M[1]	*SD*	*Mean Difference*	*t-value*
Hours Toward Degree				
Plan of Study	66.36	13.20	4.56	3.42*
No Plan	61.80	14.86		
Total Hours Passed				
Plan of Study	70.21	12.99	4.40	3.42*
No Plan	65.81	14.30		
Total Grade Point Average				
Plan of Study	3.19	.56870	.20	-3.365*
No Plan	2.99	.68640		

[1]Students in this cohort should be juniors at the time of the data collection with a minimum of 60 semester hours completed. Most degree programs in CALS require more than 120 semester hours for graduation.
*$\alpha < .05$

Conclusions/Discussion

Tinto's (1993) interactionist model provides the theoretical framework for this study and postulates that each student possesses an individual set of traits such as sex, race, class rank, ACT or SAT scores that influences their initial commitment to obtaining a degree as well as a desire to obtain a degree. The results of this study suggest that the demographic characteristics of the entering freshmen from the class of 2002 do not explain a student's decision to develop a plan of study. Contrary to Tinto's findings in 1993, the demographic characteristics of gender, race and SAT scores were not associated with whether students will complete a Plan of Study. Class percentile was found to be associated with a student's development of a Plan of Study and past research confirms that students who are academically successful are often more committed to a degree program. However, the question still remains if a class percentile mean difference of 2.20 is of practical significance.

The results of this study do indicate that a Plan of Study shows promise as an advising tool to encourage students' progress toward degree. This study supports the findings of The National Center for Education Statistics (1999) in that students who do a Plan of Study are more likely to be retained in their first two years, take more hours toward their degree, take more total hours and have a higher GPA. The process of completing a Plan of Study requires the student to choose the exact courses they will take and when they will take them which may increase the efficiency of a student's plan to complete a degree. The findings of this study are not to be interpreted as causal; however, other possible alternatives were explored and were found not to be associated.

Retention has consistently been found to be dependent on the student's academic and personal needs which require collaborative efforts from advisers, students, faculty and administrators to integrate the student both socially and academically into the University (Bedford & Durkee, 1989). As Gordan and Habley stated: "policy and procedures are linked to commitment" p.139 and suggests that policies and procedures be created to encourage student participation. The "progress toward degree" regulation of developing a Plan of Study has engaged students and faculty at our institution in a more formal and regulated advising process.

Recommendations/Implications

The future of the agriculture industry depends upon the supply of quality graduates from Colleges of Agriculture and Life Sciences. These colleges have the responsibility of assisting students in committing to a degree and completing that degree in a timely manner. Students with a Plan of Study demonstrate higher persistence and retention rates but it is not conclusive as to whether a Plan of Study increases the persistence or retention of students. Research shows that students who are organized and well planned tend to be more successful than their less focused peers. Advisors should assist students in learning how to use the Plan of Study to set academic, leadership and personal goals as they plan their four-year program. Munsell and Cornwell (1994) stated that the more support a student receives the more successful they are in meeting their goal. Advisors and university administrators must support and encourage students in this process.
Further study should be conducted to examine the relationship between completing a Plan of Study, advising and the success of the student to complete a degree in a timely manner. Research should be conducted to determine if the Plan of Study as an advising tool increases quality advising hence improving the student's performance or does a Plan of Study increase the academic interaction of the student hence strengthening the student's commitment to the University.

Quality advising is valued as a quality indicator by the institution. The university should also continue to seek feedback from advisors and administrators as to how they perceive the effectiveness of "progress toward degree" regulations and planning process. Researchers should also examine the benefits and challenges experienced by faculty and administrators who implement and enforce the regulation.

This study was exploratory in nature and limited by the number of cohorts eligible for study who have completed two years at the institution. University Planning and Analysis has formalized assessment procedures for the "progress toward degree" regulations. Longitudinal studies should be conducted in order to determine which "progress toward degree" factors most influence student retention, matriculation rates and degree completion.

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COVERAGE AND OUTCOMES OF THE SPACE AGRICULTURE IN THE CLASSROOM PROGRAM

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Abstract

The Space Agriculture in the Classroom curriculum entitled "Growing Space" was piloted in four states for the 2003-2004 school year in 6th grade classrooms. A follow-up study was conducted to assess whether the project's goals are being met. These include creating an interest in space agriculture careers among minority and urban students and exposing students of all races and backgrounds to the topics involving space and agriculture for their benefit. A questionnaire was sent to all 395 teachers who received curriculum packets, with 184 teachers responding (a 47% response rate). Of the responding teachers, 154 (84%) used the curriculum. The assessment found that almost 50% of the students in participating classrooms were of a minority group and teachers responded positively to questions regarding the interest of minority students in space and agriculture topics. The Space Agriculture curriculum also reached many students in cities and suburbs. Overall, this study provides evidence that the Space Agriculture in the Classroom materials is meeting its goals.

Introduction

The Space Agriculture in the Classroom (SAITC) program is a joint initiative of the Agriculture in the Classroom (AITC) program of the Cooperative State Research Extension and Education Service (CSREES), United States Department of Agriculture (USDA), and the National Aeronautics And Space Administration (NASA), Office of Biological and Physical Research. The Space Agriculture in the Classroom program was created in 2001 to address concerns from USDA and NASA about sustaining an adequate supply of agricultural scientists, engineers, technicians, and producers in the next three decades.

Since the early 1980's, NASA has been providing educational materials and programs through their Farming in Space Program to a relatively small, nationwide group of classroom educators. Through this partnership, USDA has recognized that NASA's vision of controlled environment farming on long duration space missions could capture the interest of technologically-oriented students and teachers. Moreover, this approach was seen by USDA as an opportunity to increase agricultural literacy for a larger number of America's youth -- a problem that the National Research Council (1988) has decried for some time. Because agriculture plays a critical role in space activities through plants that provide food, regenerate oxygen, remove carbon dioxide and purify water for long duration space missions, both organizations saw the union as highly symbiotic.

The primary academic partner of the Space Agriculture in the Classroom program is the Department of Agricultural Education and Communication at the University of Florida. The University of Florida's primary role in the Space Agriculture program is to provide educators with space agriculture instructional materials created by the Space Agriculture in the Classroom project team in the Department of Agricultural Education and Communication and NASA's Office of Biological and Physical Research. The content of the space agriculture curriculum included the most current NASA research in space agriculture, and connected this research to benefits for local and national agriculture production and related support areas such as food safety and nutrition. In essence, the project was designed to enhance student awareness of agricultural practices and the terrestrial application of space-based technologies.

With an interest in serving a wide range of students at a stage of early opinion formation, sixth grade science students and teachers were identified as the target audience for the initial year of the project. During the 2003-2004 school year the Space Agriculture in the Classroom curriculum packet was developed. This packet included a high-gloss magazine entitled "Growing Space" with pictures and graphics written on a sixth grade reading level and formatted to be interesting to those students. Lesson plans, and science experiments written for use alongside the magazine also were provided, including a laboratory activity to compare the growth of "space" and "earth" wheat. Power Point presentations and supplemental resources were provided via the Space Agriculture in the Classroom website (www.spaceag.org) to be accessible to teachers at all times. The Growing Space magazine and wheat seeds were assembled into classroom sets for participating teachers. Because the program was designed reach large numbers of students, the materials were prepared for use "as is" and no teacher workshops were provided.

When the curriculum materials were completed, a letter and sample copy of "Growing Space" magazine was sent to over 3,700 middle grade science teachers in Alabama, Florida, New Mexico, and Utah to alert them about the program and provide information on procedures for participating.[1] A total of 395 teachers requested a classroom set of materials during Fall, 2003, and Spring, 2004. Statewide coverage of the program was sought, but emphasis was placed on securing the participation of teachers in urban schools, which would also secure the participation of large minority student populations.

In order to determine if these goals were being met, an evaluation of the Growing Space curriculum was designed and implemented by members of the Space Agriculture in the Classroom project team at the University of Florida. This paper reports the results of the study and presents recommendations for strengthening the program.

[1] The list for Alabama contained 322 teachers, Florida 2,462, New Mexico 187, and Utah 771. All of the Alabama and New Mexico teachers were National Science Teachers Association (NSTA) members. For Utah, 359 teachers were NSTA members and the remainder Applied Technology teachers. The Florida teachers were identified from Florida Department of Education's list of middle school science or self-contained 6th grade teachers (who presumably taught science).

Purpose and Objectives

The purpose for evaluation of the Space Agriculture in the Classroom during its initial year of implementation was to ensure that the goals of the Space Agriculture in the Classroom program were being met. The near-term goals for the program were:

1. To increase awareness of and interest in agricultural and space sciences among middle school students.
2. To increase understanding of agricultural activities in space and on Earth.
3. To stimulate interest in careers in agriculture and engineering.
4. To secure the participation of teachers and students in urban schools.
5. To secure the participation of large numbers of minority students.

Given the goals of the Space Agriculture in the Classroom program, the *evaluation objectives* were to:

1. Assess whether program staff were successful in recruiting teachers and students in the target groups, specifically minority and urban students.
2. Assess the extent to which students were interested in and gained knowledge from the curriculum.
3. Assess whether the program stimulated interest in relevant careers.
4. Assess the functionality and utility of the curriculum materials for teachers.

The fourth objective was included to allow the project team to fine-tune materials and protocols before expanding the program into a larger number of states during the second and third years of the project.

Conceptual Framework

This study drew on Rossi, Freeman, and Lipsey's (1999) work regarding systematic evaluation. Their work involves a comprehensive approach that employs both formative and summative methods during the lifecycle of the project. The formative elements of the evaluation include assessing the coverage and delivery of the program. Program coverage is high when the target population is engaged in the program, at least to the extent allowed by the available resources. In addition, there should be no significant bias in coverage which can result from some groups participating less than others. For example, the Florida Agriculture in the Classroom program has been successful in recruiting teachers and students from rural schools but less so in suburban and urban schools (Malecki, 2003; Malecki, Israel, and Toro, 2004). A key concern for stakeholders was the ability of the program to reach suburban and urban students.

Similarly, delivery of the program is affected by the quality of the educational materials, the ease of use and adaptability of the materials, accessibility of program resources for teachers and students (in this case, through the worldwide web), and compatibility with existing curriculum and state standards. In the case of the "Growing Space" curriculum, the educational materials were developed to meet national science education standards. Findings from an assessment of coverage and delivery of the program can be used to fine-tune a continuing program.

The project team also worked closely with stakeholders from NASA and USDA to plan the program and to incorporate key questions and concerns into the evaluation design so that a focus on utilization (Patton, 1997) was maintained. This participatory approach employed logic models as a tool to focus the program design and to identify outcome measures for the summative component of the evaluation. Logic models provide a graphical display of the key components and processes for a program (Israel, 2001; Rossi et al. 1999). Logic models vary in complexity, with comprehensive models incorporating features of both program organization and service delivery (a process model) and program outcomes (an impact model). Figure 1 shows the short-term and distal outcomes that were identified by the Space Agriculture in the Classroom project team and stakeholders. Since participation is voluntary (see Hatry, 2000), the immediate outcome for the program was to recruit teachers to request a classroom set of materials and to use these materials. Other near-term outcomes focused on student-level measures, as shown in the left-half of the model.

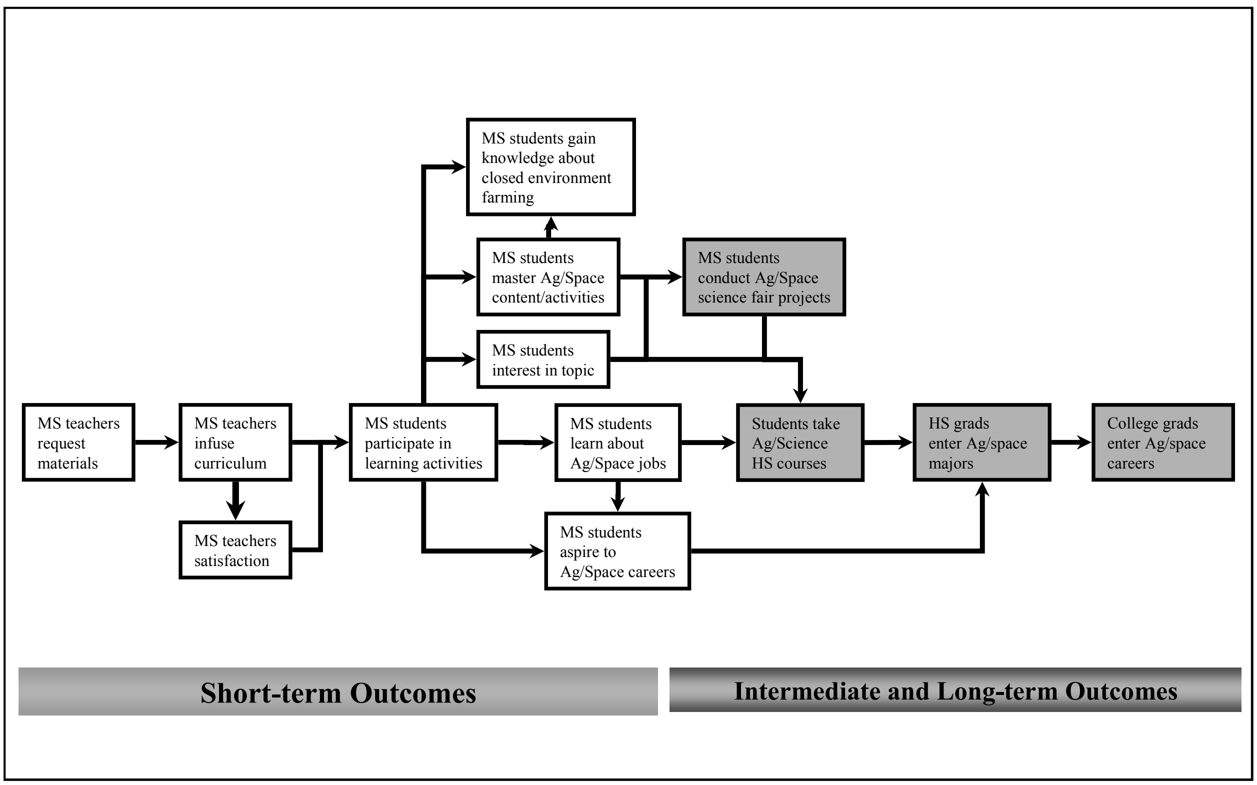

Figure 1. Impact Model for Space Agriculture in the Classroom Project.

Based on the logic model, the summative evaluation of the program should focus on measuring net changes in student-level outcomes. Net changes are those attributed to the program after confounding factors and design effects have been taken into account (Rossi et al. 1999). Consequently, some evaluation designs provide a more rigorous assessment of program impact than do others. Because the Space Agriculture in the Classroom program is a partial coverage program (that is, a minority of the potential audience could be accommodated by the program), a strong evaluation design would incorporate a control group. Successively weaker designs would omit a control group and rely on a post-only data collection design. The latter design can be adequate, however, when alternative explanations for observed changes can be reasonably ruled out. In the case of the "Growing Space" curriculum, the choice of measures and collection of follow-up data shortly after implementation are likely to have limited opportunities for factors outside the program to influence the results. Furthermore, key stakeholders found the post-only design to be an acceptable approach.

Procedures

During the 2003-2004 school year the Space Agriculture in the Classroom curriculum was piloted to 6th grade classrooms in four states: Florida, Utah, New Mexico, and Alabama. A small number of teachers from other states who requested the information were included as well. In an effort to evaluate the effectiveness of the curriculum in alignment with the goals determined by the Space Agriculture in the Classroom project team, a survey instrument was sent to all 395 teachers who received the curriculum.

The instrument contained questions that asked respondents to report on classroom and teacher demographic data, students' reactions to the curriculum, and their reactions as educators to the curriculum. Questions about demographics asked teachers to identify the grade level with which the curriculum was used, how many students were in each class and the racial composition of students (African American, Asian American, Hispanic, Native American, and Other), and how long the teacher had been in the profession.

Next, seven items asked teachers for their observations about students' responses to the curriculum.[2] This was followed by 10 items that asked for the teacher's response to accessing and implementing the curriculum. The items on students' responses to the curriculum and teachers' implementation used a Likert-scale with five categories ranging from "Not True" to "Completely True" as well as a sixth "No Opinion" option.

The last section of the survey asked three open-ended questions, and the majority of responses for these were very positive. The first asked for reasons why the respondent would recommend the Space Agriculture in the Classroom curriculum to other teachers. This was followed by questions asking respondents to list topics they would like to see added to the curriculum and any problems they encountered in accessing or using the curriculum.[3]

[2] Although collecting data directly from students is desirable for assessing learning and interest, this was outweighed by logistical problems for obtaining human subjects clearance to survey individual students and its associated costs.
[3] The survey instrument was developed by the evaluation specialist and reviewed by project team members for face validity. Given the type of data being collected, no further testing was conducted.

The data collection process was initiated late in the school year to allow teachers to complete implementation of the curriculum. Following Dillman's (2000) work, a pre-letter was sent to teachers to alert them to the survey. This was followed five days later by a cover letter and the questionnaire. After a reminder postcard was mailed to non-respondents, a second round of the survey was also mailed to non-respondents and brought the adjusted response rate to 47% (*n*=184).[4]

The data from each responding teacher were matched with school information contained in the Common Core of Data from the National Center for Educational Statistics' (NCES) website. The NCES data included enrollment numbers, ratio of teachers to students, division of the student population by race, the type of school (charter, magnet, or regular), the number of students on reduced lunch, as well as the location of the school. The NCES uses eight categories for this data: Large Central City; Mid-size Central City; Urban Fringe of Large City; Urban Fringe of Mid-size City; Large Town; Small Town; Rural, outside Metropolitan Statistical Area (MSA) and Rural, inside MSA. There were eight schools or organizations that were not listed on the NCES database. This was because they were too new or because the organization was not a public school. Knowing this data about the specific school allowed the researchers to see the type of schools and students that the Space Agriculture program was reaching, because one of the initial goals of this program was to reach minority and urban students.[5]

The data analysis in this study focused on descriptive statistics. All analyses were conducted with SPSS 12.0 for Windows.

Findings

Participation and Use of the Curriculum

Out of the 3,742 teachers who were sent information on the "Growing Space" curriculum, 395 requested and were sent classroom sets, with 356 of these from the four pilot states.[6] The participation rate was nearly one in ten. Although the adoption rate for a new curriculum, which also was not mandated and required the teacher to infuse it into an existing curriculum during the school year, might be considered impressive, it was somewhat below the program's capacity. Project records show that 21,500 of the available 30,000 copies of "Growing Space" were distributed.

Of the 184 teachers who responded to the survey, 154 (84%) used the curriculum in their classes. The remaining 16% who returned questionnaires often included a reason why they had not been able to use the curriculum during the school year. It also is likely that a larger percentage of survey non-respondents did not use the curriculum.

Although the 2003-2004 Space Agriculture curriculum was intended for sixth graders, the survey respondents reported using the curriculum with students ranging from Kindergarten to

[4] At the time of the survey, three of the 395 teachers could not be contacted because they had retired or moved.
[5] The location data also was used to compare respondents and nonrespondents. A Chi-square test showed that there was no significant bias in the data based on location (χ^2=2.9, significance level=.894).
[6] Twenty-three teachers participated from Alabama, 248 from Florida, 9 from New Mexico, and 77 from Utah. Another 39 teachers from other states requested classroom sets.

12th grade. Of the teachers who used the curriculum, 66% (*n*=101) used the materials with 6th grade classes as suggested. Also, some teachers used the curriculum with other students of middle school age. There were two teachers (1%) who used the curriculum with 5th graders, and 44 teachers (29%) who used it with 7th or 8th graders.

Overall, many of the teachers who used the curriculum had a large class size, with the median at 30 students. Six percent (*n*=9) of the classes where "Growing Space" was used had less than 15 students. Seven percent (*n*=10) of the classes reported having 15-20 students and 19% (*n*=29) of classes had 21-25 students. The assumed normal class size for most classes in public education in the United States is between 26 and 30 students. This class size represents 20% (*n*=31) of respondents. Sixteen percent (*n*=24) of classes were between 31 and 40 students. Classes larger than 40 students made up 33% (*n*=51) of the respondents. There is evidence that some teachers used the curriculum with more than one class, which resulted in the response of large class sizes.

The total number of students who were taught using the Space Agriculture curriculum is 9,378. The Space Agriculture in the Classroom curriculum reached 1,591 African American students (17%), 268 Asian American students (3%), 1,414 Hispanic students (15%), 258 Native American students (3%), and 5,487 students noted as "Other" (59%). Note that the "Other" category includes Caucasian students as well as other minorities (Figure 2). Also, two respondents included a total number of students but did not identify their students by specific race categories. A few teachers reported the total number of students but when they reported students by race it did not equal the total. Thus, the race is unknown for 333 students (3%).

Of the 9,378 students who were taught using the Space Agriculture curriculum, it can be seen in Figure 3 that 74% (*n*=6,932) of students were enrolled in schools in the top four most urban categories (Large Central City, Mid-size Central City, Urban Fringe of Large City, and Urban Fringe of Mid-size City). The total unduplicated number of schools who used the curriculum is 154. Figure 3 also shows that 75% (*n*=116) of schools that used the curriculum were from these same top four urban categories.

Of teachers using the curriculum, most were seasoned professionals. Teachers reported working an average of 13.9 years in the education profession. Relatively few less experienced teachers used the curriculum, with 17% (*n*=26) having taught less than 3 years.

Student Outcomes

The following data represents responses to the items that were concerned with the students' reactions to the curriculum, and the teacher's responses to the usability and effectiveness of the curriculum. The data in Figure 4 show that the general response among students to the curriculum was very positive. A larger majority of teachers reported that their students found the material interesting, current and it stimulated interest in science. Moreover, the materials were interesting and understandable across diverse student populations. This is

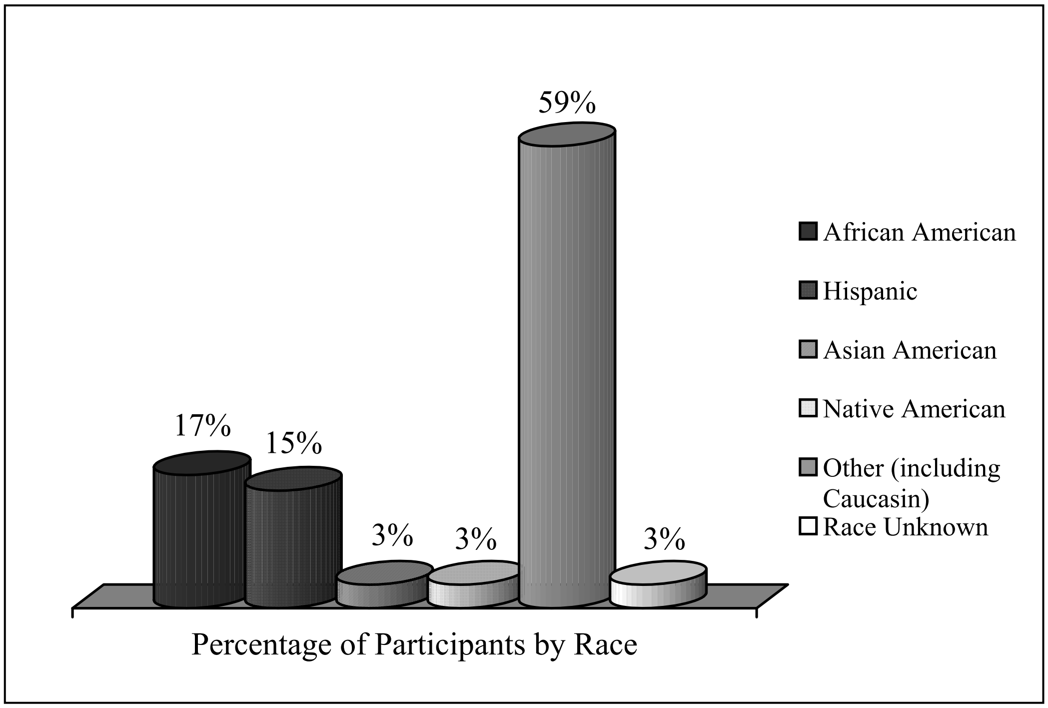

Figure 2. Percentages of student participants by race.

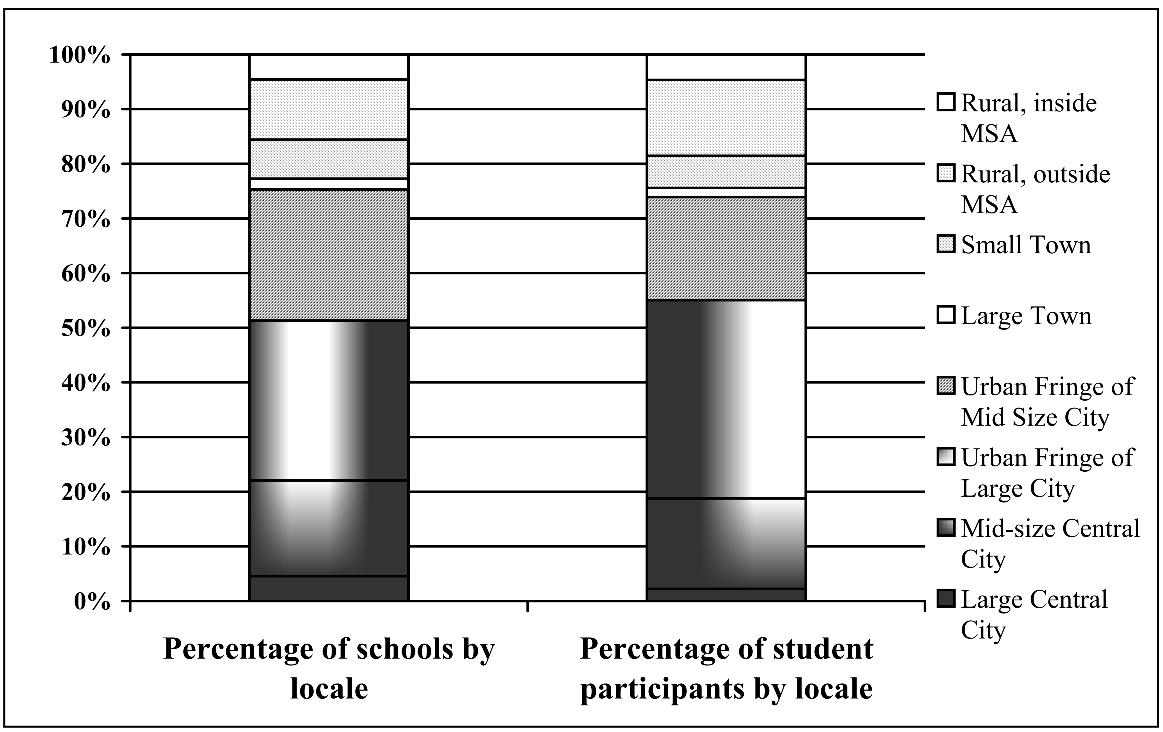

Figure 3. Percentage of schools and student Space Agriculture in the Classroom participants by locale.

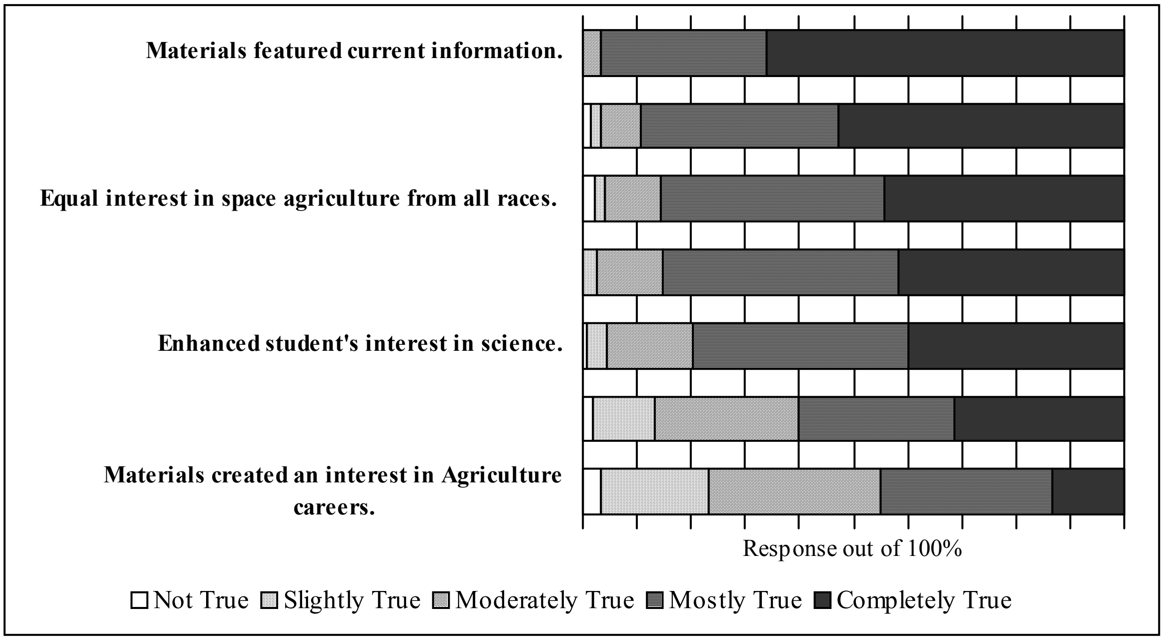

Figure 4. Responses to survey questions regarding student reactions to the Space agriculture in the classroom curriculum.

important because it contributes to the goal of recruiting and engaging minority students in the Space Agriculture in the Classroom program. Finally, the Growing Space curriculum was partially successful in stimulating interest in careers in space and, somewhat less so, in agriculture. Though a goal was to increase interest in careers, the duration of the curriculum might not have been long enough to impact students' aspirations.

Curriculum Functionality and Utility

The responses to curriculum implementation are shown in Figure 5. Teachers were asked questions based on the usability and effectiveness of the curriculum and their answers were generally positive. A large majority of teachers reported that the "Growing Space" magazine was easy for their students to understand. "Growing Space was excellent!" said one teacher. This is extremely important because the magazine was the key resource for students to read. Some teachers agreed with the statement that the magazine was written on an appropriate reading level, but the responses to this question could be skewed by the fact that some teachers did not use the curriculum with 6th grade classes as it was intended. The general consensus was that the classroom supplies were easy to use, but it seems that some teachers may have had trouble finding the time and resources to fit Space Agriculture into their classes. "It is excellent - just didn't fit my curriculum" a teacher reported. As with any new curriculum, it is assumed that some practice and comfort with the material must be established before it is totally integrated into the classroom. In general, teachers responded positively that the curriculum could fit into their state standards for education, however, a slight majority indicated that it helped to prepare for the standardized tests in that subject area.

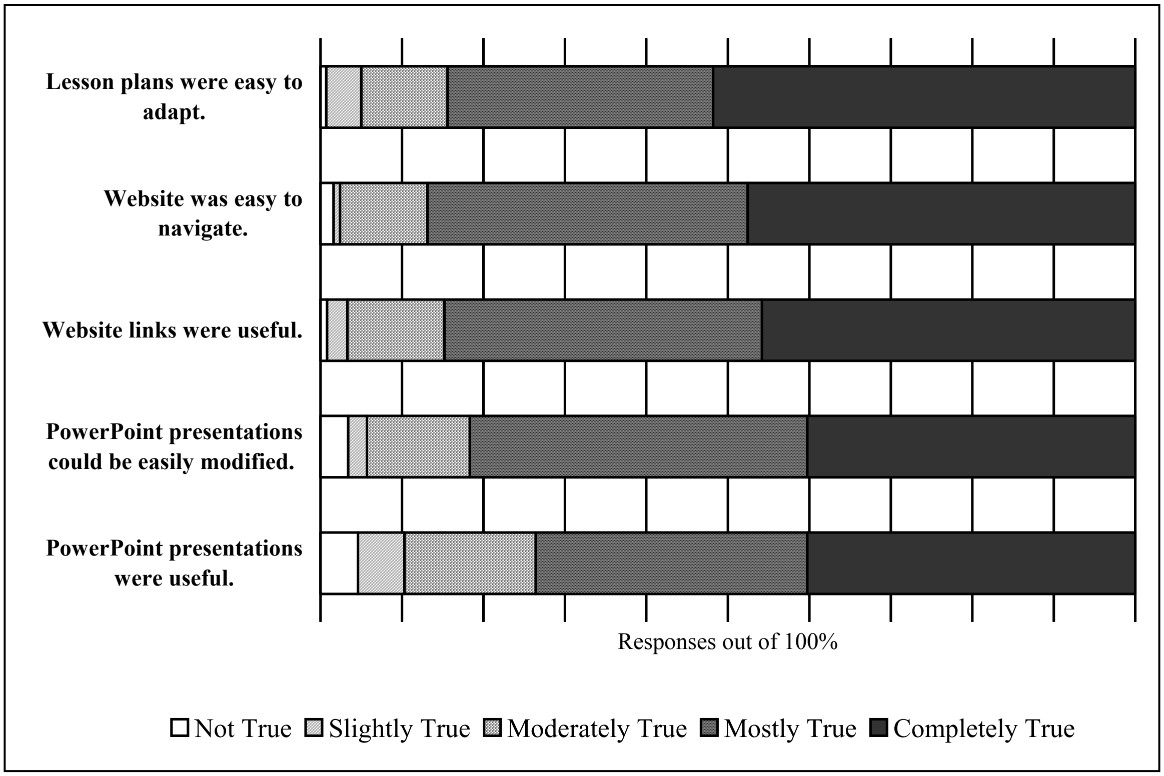

Figure 5. Responses to curriculum implementation questions regarding provided space agriculture in the classroom materials.

Respondents' reactions to supplemental teaching materials is displayed in Figure 6. A majority of respondents agreed with the statement that the pre-written lesson plans were easy to adapt for use in their classroom. For example, one teacher reported "It is really easily organized, excellent work sheet and activities." Generally, teachers reacted very positively to the Space Agriculture in the Classroom website, responding that the website was easy to navigate and the website links were useful. Respondents also reacted positively to the PowerPoint presentations that were provided on the Internet, agreeing that they were useful and could be easily modified. Based on the comments returned by respondents, some teachers have little experience with technology such as PowerPoint and had trouble modifying the presentations. This could be the reason that responses to PowerPoint questions were less positive.

Conclusions

The evidence from the follow-up survey on the Space Agriculture in the Classroom curriculum entitled "Growing Space" supports the view that the project's goals were met in part. Though the program fell short of reaching its capacity for student participation, it was successful in recruiting teachers who work with urban and minority students. Almost 50% of the students in participating classrooms were of a minority group and teachers responded positively to questions regarding the interest of minority students in space and agriculture topics. The Space Agriculture curriculum also reached many students in cities and suburbs.

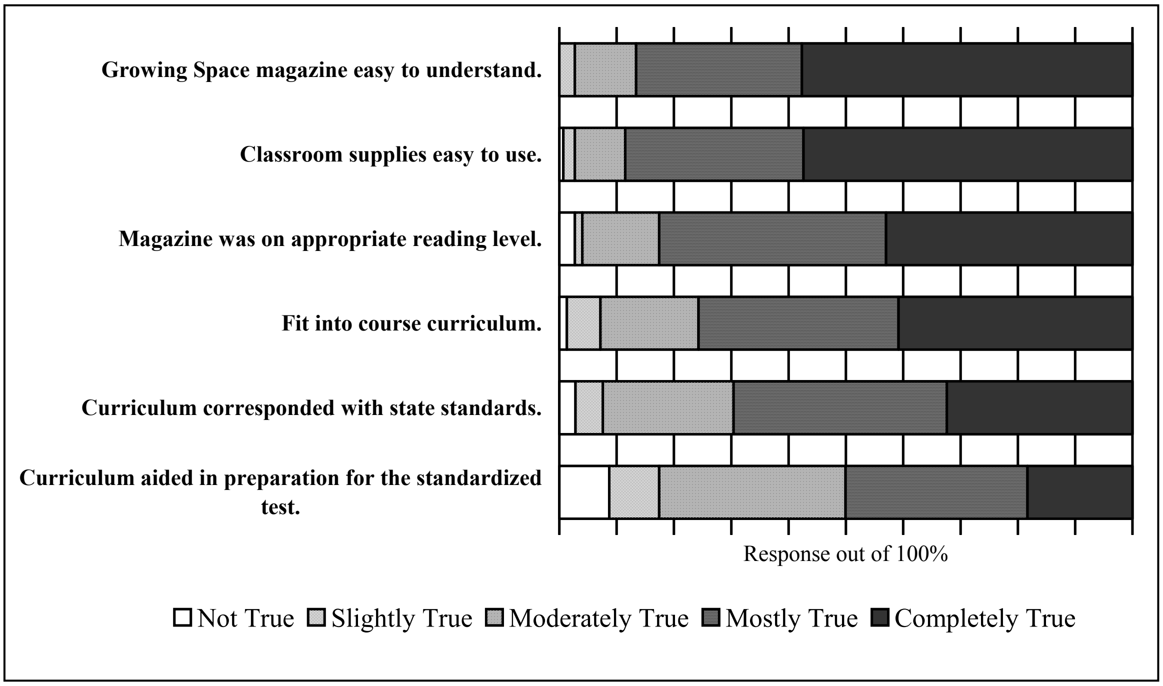

Figure 6. Responses to provided supplemental teaching resources.

The program also met goals for exposing students of all races and backgrounds to the topics involving space and agriculture for their benefit and, to a lesser extent, in creating an interest in space agriculture careers among minority and urban students. Though the evidence regarding student outcomes is far from definitive, the observations about the program's benefits by educational professionals cannot be discounted. For example, a teacher said, "I found the program to be very interesting for my students and me. The materials were up to date and relevant. The students found the water recycling fascinating." Another reported that "It allows the student to draw their own conclusions from the information given and it allows them to experience another aspect of science they may not have much knowledge about." A third wrote, "Good hands on learning experience - also good way to generate excitement about space/ agriculture combination."

The delivery of the program was generally successful from the perspective of teachers who responded to the survey. A large majority of teachers reported the "Growing Space" curriculum to be usable and effective. Indeed, a number of teachers included positive comments about the curriculum and provided suggestions for additional topics to include in new materials. On the other hand, one teacher reported "The magazines were shared between my classes and so they were well used and torn up by the conclusion of the lessons." So, future distribution should provide a set for each classroom rather than a single set per teacher. Most teachers indicated the resource materials were easy to use and adaptable but a few experienced challenges with accessing and using web-based materials. Aside from streamlining materials to reduce download times, few issues were identified that relate to delivery.

Recommendations

Based on the findings from the evaluation, the Space Ag materials can be improved by providing additional guidance for infusing the materials into existing classroom curricula and increasing access to the supplementary resources. In the case of the latter, lesson plans and PowerPoint presentations should be copied to cd-rom disks and included in the classroom packets that are sent to teachers.

It is also clear that additional efforts should be focused on recruitment. Given that the program has the capacity to involve more teachers and students, marketing efforts should be intensified. In addition to direct mailings to teachers, program personnel might rely on surrogates to advertise and promote the program. This can be done in two ways: 1) Expand the visibility of “Growing Space” in NASA’s extensive outreach to public schools, and 2) Contact science curriculum specialists in state departments of education. Support from state departments can help legitimize the curriculum in the eyes of teachers and school districts.

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STUDENT ADVISING AND MENTORING IN A COLLEGE OF AGRICULTURE: EXAMINING FACULTY AND AMINISTRATION ATTITUDES

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Abstract

This study examined the attitudes, needs and level of competence for advising and mentoring as perceived at the University of Kentucky. Results indicated perception differences existed between administrators and faculty for number of students advised and time spent by faculty in advisory roles held currently and compared to five years ago. Both administrators and faculty agreed that advisement of students and student organizations should become part of the distribution of effort (DOE). They also agreed that advising should be a valued component of promotion and tenure. However, administrators felt that it was a valued component of promotion and tenure while faculty disagreed. Perception differences were evident again regarding the value of quality advising at various levels. Administrators felt quality advising was valued at the department, college, and university levels; whereas faculty felt it was less valued at the university level. Faculty and administrators also felt advising was a good use of faculty time. Both groups felt faculty are most competent in communicating with students and assisting with planning schedules. Furthermore, for graduate students, administrators felt faculty's most important role was in advising degree/program requirements. However, faculty felt advising a graduate student's research was most important. For undergraduate advising, both groups believed the most important advisement role was in degree/program requirements. Recommendations include the formation of a College Advising Task Force comprised of faculty and administrators to address the perception differences and incorporate of new technologies for advising. Another recommendation to this college of agriculture is to create a mentoring program, with an experienced faculty and administrators serving as mentors for new faculty. Further research is also recommended to determine how faculty and administrators suggest advising duties be evaluated and rewarded. Responsibility relevant to promotion and tenure should also be examined. It is also recommended administration support advising through protecting faculty time (DOE allocation).

Introduction

Academic advising is an on-going, active process involving the student, advisor and institution (Stull, 1997), with the primary goal to assist students in the development and accomplishment of meaningful educational plans that are compatible with their life goals. Woodbury (1999) suggested that advising provides an opportunity for teaching and learning to occur that is no less important to student success than through the traditional curricula and classroom. Therefore, advising students is truly a key and integral part of each student's educational experience (Fiddler & Alicea, 1996).

The extent to which teaching faculty should be expected to advise students continues to create rifts in the higher education community. Crookston (1972) first stated advising is a form of teaching, and Boyer (1990) clearly expanded the definition of the scholarship of teaching to include such activities as the advisement of students. Yet, Boyer reported most faculty do not see their participation in activities in the teaching and service areas being rewarded by their administration. Dillon and Fisher (2000) evaluated faculty advising and found many faculty do not feel that the advising load is considered in promotion and tenure decisions.

Often, this can be an overwhelming task for new faculty, or one who has no formal training in advising students. The results of expecting unprepared faculty to advise students can be devastating to an institution and instructional programs. Kennedy, Gordon, and Gordon (1995) stated that faculty/student interaction plays a significant role in student attitudes towards their college experience. Tinto (1993) reported more students actually leave college before completing a degree than stay and graduate. Habley (1993) also noted that advising contributes to overall student success. He further stated that faculty and administrators "recognize that students who formulate a sound educational/career plan based on their values, interests, and abilities will have an increased chance for academic success, satisfaction and persistence. Academic advising remains the most significant mechanism available on most college and university campuses for aiding and abetting this important process" (p.1).

The impact of advising goes beyond that of student academic progress. It influences areas such as student retention, institution fiscal stability, and faculty perceptions (Gleennen, et al, 1996; Stowe, 1996). Numerous studies have identified advising as a frequent source of dissatisfaction among students, which is directly related to retention (Corts, Lounsbury, & Saudargas, 2000). Because more students leave college prior to graduation (Tinto, 1993), the loss of students translates into a substantial monetary loss by colleges of agriculture across the nation. Dyer, Lacey, and Osborne (1996) reported an 11 million-dollar loss at one institution because of student attrition. Glennen, Farren, and Vowell (1996) noted that proper academic advising could improve the fiscal stability of institutions by increasing graduation rates.

Some may feel that student advising may be better left to staff designated specifically for this task and not faculty members. However, Hemwall and Tracte (1999) found faculty appropriate to use as academic advisors. Faculty members are in an excellent position to learn why students want to take a course/instructor and to involve the student in the curriculum (Miller & Alberts, 1994). Additionally, students feel personal interaction with faculty has a positive influence on their overall experience at the university (Kennedy, Gordon, & Gordon, 1995).

One method to improve a person's self-efficacy and thereby improving motivation is providing professional development in that area (Mager, 1992). Petress (1996) identified four major factors that affect a faculty member's self-perceptions of his or her ability to advise: 1) how advisors interpret their advising role, 2) training and/or guidance that is provided to advisors, 3) expectations of administrators and colleagues for advisors, and 4) recognition or rewards available for competent or exemplary advising.

Professional development opportunities are not often available to faculty. There is a mistaken belief that faculty can learn all they need to know about academic advising through their own experiences as a student (Selke & Wong, 1993). Only about one-third of colleges and universities provide any type of professional development activities for advisors (Gordon &

Habley, 2000). By emphasizing the transfer of current skills to advising, professional development may assist faculty perceive their role as advisors differently (Ryan, 1992).

Theoretical/Conceptual Framework

Bandura's social-cognitive theory as adapted by Mager (1992) serves as the theoretical framework for this study. Mager noted four conditions must be present in order for a person to successfully perform a task: skill, opportunity, a supportive environment and self-efficacy. The university setting, specifically administration, can provide the first three conditions. The fourth component, self-efficacy, is supported by the faculty member.

Purpose and Objectives

The purpose of this study was to compare the attitudes, needs, and level of competence in advising as perceived by faculty and administration in a land grant institution. The following objectives accomplished this purpose:

1. Compare advising in terms of rewards and time commitments.
2. Determine attitudes/perceptions of faculty and administration toward student advising.
3. Examine faculty and administrators perspectives on the competence/preparation level in advising students.
4. Compare the advising roles faculty and administrators perceive to be most important.

Procedures

This study used a descriptive research design. The population for this study was 65 faculty and 15 departmental administrators at the University of Kentucky College of Agriculture. Names and contact information were obtained from the college Associate Dean for Academic Programs office. Data were collected from a census of the population.

Myers & Dyer (2000) created the instrument and it was used with their permission. This instrument assessed attitudes, needs, and perceptions of faculty members. Respondents were mailed an attitudinal questionnaire that used a four-point Likert scale (1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree) to assess their attitudes. A four point scale was used to compel the respondent to express an opinion about the statement. Dillman (2000) noted that it is acceptable to provide attitudinal questions without giving the option of a neutral statement. Additionally, each question was stated general enough that all faculty serving as advisors would have adequate knowledge on the subject to form an opinion. Open-ended and short-answer questions were used to gather demographic information.

Face and content validity for the instrument was established using a panel of experts consisting of faculty, administrators, and graduate students at two land grant universities. In addition, face and content validity were established by the researchers prior to implementing this study. Few modifications were made focusing the instrument to meet specific topics pertaining to this population. The instrument was pilot tested using individuals similar to those in the sample, and the coefficient of internal consistency was established at r=.94 using the Spearman-Brown test for reliability. Reliability for the individual constructs of "Value of Advising", "Attitudes/Perceptions Toward Advising," and "Perceived Knowledge and Preparation for Advising" was determined using Chronbach's alpha. Reliability coefficients for each of these constructs were calculated at .68, .68, and .88, respectfully.

In an attempt to get as much input as possible and reduce non-response error, a total of six contacts were made (Dillman, 2000). These included a pre-study electronic mail contact, instrument mailings, and reminders via both e-mail and campus mail. Fifty-one faculty and ten administrators returned instruments with 78.5% faculty and 66.7% administrators responding. In addition, no differences were found between early and late respondants. Data were analyzed using SPSS software. Frequencies, standard deviations, percentages, and means for calculated for individual questions. Although by definition Likert-type scales produce ordinal data, results were treated as interval data for analysis and interpretation purposes. This procedure is commonly accepted in social science research, especially if data are categorized into equal intervals as was done in this study (Clason & Dormody, 1994).

Findings

The first objective focused on time commitments for faculty. Administrators reported 123 undergraduate students in their respective departments and 33.8 graduate students. Forty one percent of faculty respondents are full professors, 37% associate professors, 19.6% assistant professors and 2.2% reported other. Regarding tenure status, 80% of faculty are tenured, 16% are not tenured, however are on the tenure track and 4.0% are not eligible for tenure.

Faculty advised an average of 22.4 undergraduates and 6.2 graduate students, whereas administrators reported faculty advised approximately 13.2 undergraduates and 2.2 graduate students in their department. Faculty reported meeting undergraduate advisees 2.0 times per semester for an average of 33.3 minutes per session. For graduate students, faculty reported meeting 8.1 times per semester for an average of 41.1 minutes each meeting.

Administrators reported faculty met with undergraduate advisees 1.7 times per semester for an average of 26.0 minutes, and graduate students 7.5 times per semester for an average of 60.0 minutes. Faculty reported spending approximately 8.1 hours per month advising undergraduates, while administrators reported faculty spent 3.4 hours/month. For graduate advising, faculty reported spending 12.4 hours per month, whereas administrators viewed faculty spending 18.4 hours a month.

Time spent advising students at both levels were examined compared to five years ago (see Table 1). Faculty viewed time spent advising undergraduate students have increased (64.7%) and time with graduate student advising has stayed about the same (35.3%). Administration believed time spent advising students has stayed about the same for both undergraduates (50.0%) and graduates (50.0%).

The first objective also compared advising in regards to rewards (Table 2). Both faculty (M=3.72) and administrators (M=3.67) believed strongly that the number of students advised should be a component of the faculty's Distribution of Effort (DOE). Agreement is also shared (M=3.43 for faculty, M=3.44 for administration) that students should utilize electronic scheduling for advising appointments. Promotion and Tenure issues for student academic advising and student organizations are an area of concern for both groups, however faculty (M=1.92 and M=1.86) are more concerned than administrators (M=2.78 and M=2.44).

Table 1
Time Faculty Spend Advising Students

Compared to five years ago, amount spent advising has...	Undergraduate				Graduate			
	Faculty		Administration		Faculty		Administration	
	f	%	f	%	f	%	f	%
Increased	33	64.7	2	25.0	16	31.4	2	25.0
Stayed about the same	15	29.4	4	50.0	18	35.3	4	50.0
Decreased	1	2.0	1	12.5	10	19.6	1	12.5
N/A	2	3.9	1	12.5	7	13.7	1	12.5

Table 2
Advising in Terms of Rewards and Time Commitments

	Faculty				Administration			
Statement	*M*	*SD*	A[a]	D[a]	*M*	*SD*	A[a]	D[a]
Number of students advised should be a component of teaching DOE.	3.72	.49	98.0	2.0	3.67	.69	88.9	11.1
Students should utilize the electronic advising schedule.	3.43	.68	93.5	6.5	3.44	.53	100.0	0.0
Advising student organizations should be included of teaching DOE.	3.34	.72	86.0	14.0	3.11	1.1	77.7	22.2
Academic student advising should be a component of P&T.	3.18	.93	77.5	22.4	3.33	.71	88.8	11.1
Advising student organizations should be a component of P&T.	2.68	.91	67.3	32.7	2.78	.83	77.8	22.2
Students should utilize advising sessions with faculty: walk-in basis.	2.16	.75	32.6	67.4	2.11	.60	22.2	77.8
Academic student advising is a valued component of P&T.	1.92	.81	20.4	79.6	2.78	.83	55.5	44.4
Advising student organizations is a valued component of P&T.	1.86	.74	16.3	83.7	2.44	.88	44.4	55.5

The second objective, displayed in Table 3, determines attitudes/perceptions of faculty and administration toward advising. Faculty (M=3.39) and administrators (M=3.60) agreed advising undergraduate students were a good use of faculty time. This same trend exists for advising graduate students and student organizations. Both groups agreed advising graduate students were a good use of time (Faculty, M=3.64; Administrators, M=3.89). Once again, agreement was also shared regarding the statement that faculty believe advising student organizations is a good use of faculty time (Faculty, M=3.23; Administrators, M=3.33). In addition, faculty (M=3.49) and administrators (M=3.33) agreed advising graduate students is a scholarly activity. However, when viewing advising undergraduate students as a scholarly activity, less support was seen from both administrators (M=2.89) and faculty (M=2.69).

Table 3
Faculty and Administrator Attitudes Regarding Advising

	Faculty				Administration			
Statement	*M*	*SD*	A[a]	D[a]	*M*	*SD*	A[a]	D[a]
Advising *GRADUATE* students is a good use of faculty time.	3.64	.49	100.0	0.0	3.89	.33	100.0	0.0
Advising students is an effective way to build rapport.	3.62	.49	100.0	0.0	3.63	.52	100.0	0.0
Advising plays an important role in retaining students.	3.57	.68	93.9	6.1	3.89	.33	100.0	0.0
Advising *GRADUATE* students is a scholarly activity.	3.49	.58	96.0	4.1	3.33	.87	77.8	22.2
Advising *UNDERGRADUATE* students is a good use of faculty time.	3.39	.80	84.4	15.7	3.60	.52	100.0	0.0
Advising student organizations is a good use of faculty time.	3.23	.69	85.4	14.6	3.33	.71	88.9	11.1
Advising plays an important role in recruiting students.	2.90	.94	67.3	32.7	3.22	.68	88.9	11.1
Quality advising is valued in my department.	2.86	.76	71.5	28.6	3.67	.50	100.0	0.0
Quality advising is valued in my college.	2.78	.91	62.0	38.0	3.63	.52	100.0	0.0
Advising *UNDERGRADUATE* students is a scholarly activity.	2.69	.96	55.1	44.9	2.89	.78	66.6	33.3
Only faculty with teaching appts should advise *UNDERGRADUATES*	2.48	1.0	54.0	46.0	2.67	1.1	44.4	55.5
Quality advising is valued at the University level.	2.12	.94	34.0	66.0	3.11	.59	88.9	11.1
Only faculty with teaching appointments should advise *GRADUATES*	1.79	.83	17.1	83.0	1.22	.42	0.0	100.0
Only faculty with teaching appts should advise student organizations.	1.78	.77	12.3	87.8	1.78	.83	22.2	77.7

[a] Means were indexed and categorized as follows: D=Disagree (M = 1.00-2.49), A=Agree (M = 2.50-4.00).

Administrators (M=3.89) and faculty (M=3.57) both agreed that advising played an important role in retaining students. In addition, both administrators (M=3.63) and faculty (M=3.62) also agreed advising students is an effective way to build rapport. At the department level, faculty (M=2.86) agreed quality advising is valued, while administrators also (M=3.67) agreed. Pertaining to the college level, faculty (M=2.78) and administrators (M=3.63) still agreed with the statement. Faculty perception of whether quality advising is valued at the university was one of disagreement with a mean value of only 2.12. However, administrators (M=3.11) still agreed that quality advising is valued at the university level.

Table 4 examines faculty and administrators perspectives on the faculty's preparation level in advising students. Faculty (M=3.76) and administrators (M=3.56) agreed that faculty feel comfortable in communicating one-on-one with students. Strong agreement existed among faculty (M=3.65) and administrators (M=3.44) with the faculty's comfort level in assisting students in planning their academic course schedule. Furthermore, both faculty (M=3.10) and administrators (M=2.89) agreed faculty felt prepared in advising student organizations.

Table 4
Faculty Preparation Level in Advising Students

Statement	Faculty				Administration			
Faculty…	*M*	*SD*	A[a] (%)	D[a] (%)	*M*	*SD*	A[a] (%)	D[a] (%)
Feel comfortable in communicating with students.	3.76	.46	98.0	2.0	3.56	.52	100	0.0
Feel prepared in assisting students in planning schedules.	3.65	.52	97.9	2.0	3.44	.52	100	0.0
Feel prepared in counseling students on making career choices.	3.36	.59	94.0	6.0	2.89	.50	88.9	11.1
Know where to find information on academic policies.	3.33	.65	89.8	10.2	3.22	.44	88.9	11.1
Current expertise in advising students is adequate.	3.25	.75	80.6	19.6	2.67	.50	66.7	33.3
Are aware of campus resources for students with academic difficulty.	3.10	.76	76.0	24.0	2.89	.33	66.7	22.2
Feel prepared in advising student organizations.	3.10	.78	82.0	18.0	2.89	.33	88.9	11.1
Feel prepared in counseling students on personal matters.	2.82	.95	69.4	30.6	2.00	.50	11.1	88.9
Feel prepared in using on-line advising tools.	2.76	.98	62.0	38.0	2.89	.60	77.8	22.2
Feel prepared in knowledge of legal issues concerning advising.	2.36	.89	40.0	60.0	2.22	.44	22.2	77.8

[a] Means were categorized as follows: D=Disagree (M = 1.00-2.49), A=Agree (M = 2.50-4.00)

The third objective identified areas in which faculty feel most competent (see Table 5). Administrators (M=3.67) identified degree/program requirements as the area in which faculty felt most competent, however faculty identified course scheduling as the area they were most comfortable (M=3.48) and degree/program requirements ranking second (M=3.46). Faculty (M=3.10) and administrators (M=3.11) viewed faculty competent with career counseling. Administration (M=3.00) perceived faculty more competent in advising student organizations than faculty (M=2.69) viewed themselves. Faculty felt least competent in the area of financial assistance opportunities (M=2.17) and administrators viewed faculty least competent in the area of helping students with personal issues (M=1.78).

The fourth objective sought to identify advising roles faculty and administrators perceive to be most important at the undergraduate and graduate programs. Index scores of respondent rankings were used to determine an overall ranking of advising roles. As noted in Table 6, faculty and administrators showed strong agreement on what roles they perceived as most important for advising undergraduates. Both groups ranked the areas of degree/program requirements, course scheduling, and career counseling as their top three. Activities/competitions were ranked the least important role by both faculty and administration.

Table 5
Areas Faculty Feel Most Competent

Statement	Faculty				Administration			
	M	*SD*	Competent (%)	Not Competent (%)	*M*	*SD*	Competent (%)	Not Competent (%)
Course Scheduling	3.48	.65	91.7	8.3	3.44	.52	100	0.0
Degree/Program Requirements	3.46	.71	87.5	12.5	3.67	.50	100	0.0
Career Counseling	3.10	.69	81.3	18.8	3.11	.78	77.7	22.2
Industry/Job Market Demands	3.06	.69	79.2	20.8	2.78	.66	66.7	33.3
Student Organization Advising	2.69	.94	56.2	43.7	3.00	.92	87.5	12.5
Activities/Competitions	2.60	.98	58.4	41.7	2.88	.99	75.0	25.0
Personal Issues	2.42	.94	52.1	47.9	1.78	.66	11.1	88.9
Financial Assistance Opportunities	2.17	.95	37.5	62.5	2.33	.70	22.2	77.8

Table 6
Important Advising Roles for Undergraduate Students

Item	Administrator		Faculty	
	Rank	Index Score[a]	Rank	Index Score[a]
Degree/Program Requirements	1	87	1	358
Course Scheduling	2	79	2	341
Career Counseling	3	57	3	309
Scholarship/Aid Counseling	4	46	6	161
Personal Issues	5	44	5	187
Industry/Job Market Demands	6	37	4	199
Student Organization Advising	7	35	7	142
Activities/Competitions	7	35	8	119

[a] An index score was calculated by reverse respondent ranking (e.g., 1 = 8 pts, 2 = 7 pts, etc.) and summing total points received by each item.

Important roles for advising graduate students are identified in Table 7. Administrators ranked degree/program requirements as the most important; however faculty ranked research as their most important role for graduate student advisement. Administrators ranked research as a close second and the faculty's second was degree/program requirements. Both groups agreed that the least important advising role regarding graduate students is student organization advising and activities/competitions.

Table 7
Important Advising Roles for Graduate Students

Item	Administrator Rank	Administrator Index Score[a]	Faculty Rank	Faculty Index Score[a]
Degree/Program Requirements	1	81	2	328
Research	2	80	1	365
Career Counseling	3	66	3	307
Course Scheduling	4	58	4	267
Industry/Job Market Demands	5	42	5	240
Scholarship/Aid Counseling	6	40	7	145
Personal Issues	7	37	6	161
Activities/Competitions	8	23	8	141
Student Organization Advising	9	7	9	62

[a] An index score was calculated by reverse respondent ranking (e.g., 1 = 8 pts, 2 = 7 pts, etc.) and summing total points received by each item.

Conclusions

Perception differences existed between administration and faculty in the number of students advised and time spent by faculty advising students. Compared to administrators, faculty believe time spent advising undergraduate students has increased and time spent with graduate students has remained unchanged in the last five years. Administrators perceive faculty spend less time and contact in advising undergraduate students than faculty report. Both faculty and administration agree the number of students advised academically and within student organizations should be a portion of the teaching appointment, or distribution of effort (DOE).

Agreement is shared by faculty and administration that students should utilize the electronic advising schedule and that fewer appointments should be made on a walk-in basis. Both administration and faculty believe academic advising should be a component of the Promotion and Tenure review process. Administrators perceive it is a valued component, however faculty disagree and view it as not valued.

Administration and faculty are in agreement that advising students – undergraduates, graduates, and/or student organizations – is a good use of faculty time. Both administrators and faculty believe faculty's role in advising students is a great opportunity to build rapport and retain students. Faculty and administration consider advising graduate students more scholarly than advising undergraduates. Differences exist among administration and faculty regarding value of quality advising. Administrators strongly believe quality advising is valued at the university level, however faculty disagreed it was valued at the top administration. Both groups agree that faculty feel comfortable in communicating with students and assisting in planning student schedules. Faculty believe they are least competent in their knowledge of legal issues surrounding advising, whereas administrators perceive counseling students on personal matters as the faculty's area least competent.

Administrators and faculty feel that the most important role of an undergraduate advisor is advising students regarding degree/program requirements. Both administrators and faculty also believe the least important area for undergraduate student advisement is activities and competitions. However, in regards to the role of a graduate student advisor differences between the two groups existed. Administrators felt faculty's most important role in advisement was with degree/program requirements; whereas faculty believe advising students with research is most important. Both administrators and faculty agree that advising student organizations and activities/competitions were the least important roles for advising graduate students.

Recommendations

Perception differences exist between administration and faculty in the number of students advised and time spent by faculty advising students. This may be due to a lack of communication between faculty and administration. It is recommended that the College of Agriculture at this land-grant institution create College Advising Task Force composed of both faculty and administration to address this issue. Representing all departments, members could begin dialogue in each department, but also carry discussion in a wider context through the college and university. . It is also recommended this Task Force/Work Group collaborate with the Professional Development committee within the college to create professional development seminar topics. Discussion topics for professional development seminars could include promotion and tenure accountability, Distribution of Effort (DOE) allocation specific towards advising, and the other issues faculty and administration need help (such as the legality for advising and assisting students with personal issues). New technologies faculty support in student advising should be utilized and incorporated. Examples may include on-line and electronic advising for scheduling appointments.

The Distribution of Effort (DOE) allocation towards advising is an issue for both faculty and administration, as both groups agreed advising should be reflected in the DOE. It is recommended that department chairs support the role of advising through revising each faculty's DOE to more accurately reflect faculty's time commitment in advising both undergraduate and graduate students. Time allocation and responsibility pertaining to Promotion and Tenure is a larger issue for faculty. Further research is warranted to determine how faculty and administrators suggest advising duties be evaluated and rewarded. More importantly the promotion and tenure process is important--especially for new assistant professors. Therefore, it is recommended that a new faculty mentoring program be established. This mentoring program could focus on the role and responsibility as an academic and/or student organization advisor. More importantly, this specific mentoring program could include the administrator as a mentor in professional development of outstanding faculty. Another recommendation is for new faculty to seek out the assistance of experienced faculty and administrators pertaining to advising.

Discussion/Implications

Selke & Wong (1993) reported it is a mistaken belief that faculty can learn all they need to know about academic advising through their own experiences as a student. Furthermore, only one-third of colleges and universities are reported to provide any type of professional development activities for advisors (Gordon & Habley, 2000). This study provided information to Colleges of Agriculture that they are not exempt or alone. Providing faculty professional development is vital to the success of student advising in areas of student/faculty rapport and student retention. Kennedy, Gordon, & Gordon (1995) reported students feel that personal interaction with faculty has a positive influence on their overall experience at an institution. Not only will positive interaction through advising foster student success, it will provide great financial rewards back to the university. Therefore, advising students is an important aspect to faculty, college and university success and issues on this topic must be examined in more depth.

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