NORTH CENTRAL REGION
RESEARCH CONFERENCE PROCEEDINGS

American Association for
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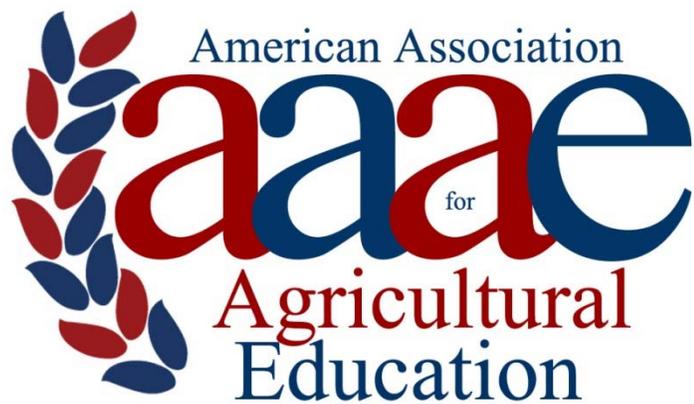
Research Session Coordinator
West Virginia University
Morgantown, West Virginia

Conference Host
University of Illinois
Urbana-Champaign, Illinois

Friday, October 5, 2012

2011 North Central Research Conferences

Friday, October 5, 2012
8:00 A.M. to 9:30 A.M. - Research Session I

Concurrent Session A
Theme: Distance Education
Discussant: Neil Knobloch, Purdue University
Facilitator: Melissa Welsh, Purdue University

Concurrent Session B
Theme: Teacher Education and School-based Agricultural Education Programs
Discussant: Shannon Washburn, Kansas State University
Facilitator: Scott Smalley, Iowa State University

Concurrent Session C
Theme: Agricultural Leadership
Discussant: Brad Greiman, University of Minnesota
Facilitator: Preston Byrd, Iowa State University

Friday, October 5, 2012
10:00 A.M. to 11:30 A.M. - Research Session II

Concurrent Session D
Theme: Teacher Professional Development
Discussant: Andy Baker, Western Illinois University
Facilitator: Matthew Shultz, Iowa State University

Concurrent Session E
Theme: Extension and International Education
Discussant: Matt Raven, Michigan State University
Facilitator: Rebekah Northrup, Purdue University

Concurrent Session F
Theme: Strengthening Academic Learning Through Agricultural Education
Discussant: Mark Zidon, University of Wisconsin, Platteville
Facilitator: Katie Reichling, University of Wisconsin, Platteville

Review Process for the
North Central Research Conference

The AAAE North Central members express their sincere gratitude to AAAE colleagues who served as reviewers, discussants, facilitators, and presentation judges for research papers submitted for the 2012 North Central Research Conference. A total of 38 research manuscripts were submitted. The AAAE Protocol Guidelines for Conference Paper Selection were used in the paper review and selection process. Twenty-four papers were selected for presentation at the 2012 North Central Conference.

Manuscript Reviewers

Jennifer Alexander	Oregon State University
Shannon Arnold	Montana State University
Mollie Aschenbrener	California State University, Chico
Kirby Barrick	University of Florida
Gary Briers	Texas A&M University
Thomas Broyles	Virginia Tech University
Scott Burris	Texas Tech University
James Christiansen	Texas A&M University
Steven "Boot" Chumbley	Eastern New Mexico University
Marcus Comer	Virginia State University
Nina Crutchfield	National FFA Organization
David Doerfert	Texas Tech University
Leslie Edgar	University of Arkansas
Don Edgar	University of Arkansas
Kirk Edney	Instructional Materials Service
Michael Edwards	Oklahoma State University
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Paula Faulkner	North Carolina A&T University
Ryan Foor	University of Arizona
Edward Franklin	University of Arizona
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Martin Frick	Montana State University
Nick Fuhrman	University of Georgia
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Ray Herren	University of Georgia
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Eric Kaufman	Virginia Tech University
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Brian Myers	University of Florida
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Matthew Portillo	University of California
John Rayfield	Texas A&M University
John Ricketts	Tennessee State University
Kristina Ricketts	University of Kentucky
Rudy Ritz	Texas Tech University
Grady Roberts	University of Florida
Jeremy Robinson	Oklahoma State University
Steven Rocca	California State University, Fresno
P. Ryan Saucier	Texas State University
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Kristin Stair	New Mexico State University
Christopher Stripling	University of Tennessee
Robert Strong	Texas A&M University
Kirk Swortzel	Mississippi State University
Rob Terry	Oklahoma State University
Andrew Thoron	University of Florida
Robert Torres	University of Arizona
Allison Touchstone	University of Idaho
Jonathon Velez	Oregon State University
Stacy Vincent	University of Kentucky
Wendy Warner	North Carolina State University
Brian Warnick	Utah State University
Jennifer Williams	Texas A&M University
Kevin Williams	West Texas A&M University
Elizabeth Wilson	North Carolina State University
Kattlyn Wolf	University of Idaho

Discussants

Andy Baker	Western Illinois University
Brad Greiman	University of Minnesota
Neil Knobloch	Purdue University
Matt Raven	Michigan State University
Shannon Washburn	Kansas State University
Mark Zidon	University of Wisconsin Platteville

Facilitators

Preston Byrd	Iowa State University
Rebekah Northrup	Purdue University
Katie Reichling	University of Wisconsin Platteville
Matthew Shultz	Iowa State University
Scott Smalley	Iowa State University
Melissa Welsh	Purdue University

Presentation Judges

Stacy Gartin	West Virginia University
Bart Gill	Western Illinois University
Amy Smith	South Dakota State University

The Effect of a New Media Course on Students' Thinking and Behavior

Katie Abrams, *University of Illinois*
Lauri Baker, *Kansas State University*

Introduction

New media channels present an opportunity to facilitate communication of agricultural information. Social media, in particular, is changing audience and organization's expectations for communication. Employers of agricultural communicators are looking to future graduates to offer them an understanding of Web-based communication tools –including models and theories that inform their effectiveness and skills to produce communication within these mediums (Akers & Irlbeck, 2009). To meet these expectations, universities must prepare graduates to use current tools and be adaptive as new tools quickly evolve.

Conceptual Framework

The conceptual framework of critical thinking and conceptual change in education guided this study. "Critical thinking is a reasoned, purposive, and introspective approach to solving problems or addressing questions, with incomplete evidence and information, and for which an incontrovertible solution is unlikely" (Rudd, Baker, & Hoover, 2000, p. 5). Infusing critical thinking into a course can be done through the use of collaborative learning activities (Adams & Hamm, 1996) and asking students to evaluate arguments and make judgments based on more than the information provided (Astleitner, 2002).

New media naturally lends itself to critical thinking in that "these media did not exist before now" (Lister, Dovey, Giddings, Grant, & Kelly, 2003, p. 5), which offers students a platform to make decisions where all the rules have not been determined. Research into student perceptions of use indicates students' personal use of social media does not mean they are comfortable using it in other situations (Settle et al., 2011). Research has uncovered that many students leave the educational system unprepared to think critically (Flores et al., 2010), while people whose attitudes are changed through an intervention are more likely to engage in greater processing of information (Petty, Tormala, Briñol, & Jarvis, 2006), which corresponds to an improved critical thinking disposition.

"Education is about conceptual change, not just the acquisition of information" (Biggs, 1999, p. 60). Conceptual change can be measured through the social technographics ladder, which describes an individual's participatory level in relation to social media (Bernoff & Li, 2008). The highest point on this ladder are creators who publish blogs or webpages. The next highest rung are critics who post ratings/reviews of products/services. Further down on the ladder are collectors who use RSS feeds. Next are the joiners; who maintain a profile on a social networking site. Lower still on the ladder are the spectators who read content online. At the bottom rung are the inactives who do not engage in any interactions online.

Purpose and Objectives

The purpose of this study was to determine students' change in critical thinking, attitudes toward new media, and new media behavior patterns (conceptual change) after participating in a course on new media. It was of additional interest to the researchers to determine if there was a difference in these variables if skills or strategy were taught first in the course. The objectives of this study were to determine whether a new media course and the way it is taught can affect students': 1) critical thinking disposition, 2) attitude toward new media, and 3) social technographics profiles. This study strived to address priority area number three in the *National Research Agenda for the American Association for Agricultural Education,* which is to work toward a "sufficient scientific and professional workforce that addresses the challenges of the 21st century," specifically "developing the models, strategies, and tactics that best prepare, promote, and retain new professionals who demonstrate content knowledge, technical competence, moral boundaries, and cultural awareness coupled with communication and interpersonal skills" (Doerfert, 2011, p. 9).

Methods

To address the research objectives, a descriptive pre- and post-test design was used. The independent variables were the new media course and the order in which skills and strategy were taught. A course on new media was developed and taught at two universities in fall 2011. Both courses had the same learning objectives, the same content and assignments, and integrated ideas from the literature on how to infuse critical thinking into the classroom through the use of groups (Adams & Hamm, 1996) and asking students to make evaluative judgments (Astleitner, 2002). Different instructors taught the courses with different approaches. The instructors were both agricultural communications assistant professors with the same amount of teaching experience.

Course A taught new media strategy first and ended with skills/how-to instruction. Course B taught students new media skills first and strategy second. Both courses incorporated the same assessments and application of subject matter. Both courses began with 15 students and ended with 14 students.

Students were given a pretest the first day of class that assessed initial levels on critical thinking, social technographics, attitudes toward new media tasks, and new media behavior patterns. To assess critical thinking, the EMI Critical Thinking Disposition Assessment (Irani et al., 2007) was used. The reliability of the EMI scale in this study was $\alpha = .89$ for the pretest and $\alpha = .83$ for the post-test. To assess social technographics, attitudes toward new media, and new media behavior patterns, the researchers developed their own scales using a set of likert scale and yes/no questions. The only social technographics scale with an acceptable reliability on both the pre- and post-test was the critic scale (8 items) with $\alpha = .74$ and $\alpha = .80$, respectively. Therefore, only that scale was used in the analysis.

The reliability of the new media tasks attitude scale was $\alpha = .71$ for the pretest and $\alpha = .70$ for the post-test. Students were given a post-test that was nearly identical (verbs changed to past tense) to the pre-test. Data were analyzed using IBM SPSS version 19 to obtain descriptive (frequencies, means, and standard deviations) statistics on the demographics and dependent

variables and inferential statistics (t-tests) to test the influence of the course and the way in which it was taught.

Results

The sample was primarily female (76.9%, *n* = 20) and juniors (34.6%, *n* = 9) and seniors in college (61.5%, *n* = 16). The majority were agricultural communications majors (76.9%, *n* = 20), the remainder were advertising.

Objective 1: Critical Thinking

A paired samples *t*-tests showed no significant difference on the total EMI score between the pre- (*M* = 107.08, *SD* = 8.20) and post-test (*M* = 107.20, *SD* = 18.08), *t*(25) = -.34, *p* > .05, meaning the course had no effect on critical thinking. This score was within the typical range of 59-130 (Irani et al., 2007).

Course A taught concepts and strategy before skills, whereas Course B taught skills first. An independent samples *t*-test showed no difference between Course A (*M* = 101.01, *SD* = 22.7) and B (*M* = 112.50, *SD* = 11.26) *t*(24) = -1.67, *p* = .11 (two-tailed) on the post-test. None of the constructs of the EMI scale were statistically significant between the courses, meaning order of skills versus strategy did not affect critical thinking.

Objective 2: Attitude Toward New Media

To assess this objective, four outcomes were measured: 1) students' attitudes toward various new media tasks, and 2) students' comfort level using and teaching themselves new media in general.

Tasks. Paired samples *t*-tests were conducted to examine the effect of attitudes toward new media tasks. Results showed attitudes significantly increased positively on using Photoshop to create graphics and editing images. On most items, the mean attitude increased positively but the change was not significant. Independent samples *t*-tests found no statistically significant difference between Courses A (*M* = 3.74, *SD* = .46) and B (*M* = 3.79, *SD* = .46) on total attitude, *t*(24)= -.24, *p* = .82.

Perceived comfort. Two independent questions assessed students' comfort levels with using new media and teaching it to themselves on a semantic differential scale where 1= very uncomfortable and 4 = very comfortable. Paired samples *t*-tests revealed a positive increase in their mean comfort levels after taking the course from *M* = 2.73 (*SD* = .78) to *M* = 3.08 (*SD* = .85) on teaching themselves new communications technology and from *M* = 3.00 (*SD* = .85) to *M* = 3.31 (*SD* = .84) on using it. The differences were not statistically significant (*p* = .09 and *p* = .78, respectively).

An independent samples *t*-test showed no significant difference in "teaching yourself…" for skills taught first (Course B), *M* = 3.14, *SD* = .86; and skills taught last (Course A), *M* = 3.00, *SD* = .85; *t*(24) = -.42, *p*= .68. There was no significant difference in "using…" for skills taught first (Course B), *M* = 3.36, *SD* = .84; and skills taught last (Course A), *M* = 3.25, *SD* = .86; *t*(24) = -.32, *p*= .75.

Objective 3: Social Technographics

The critic scale measured the frequency for students' participation in critic activities online, where 1= Never, 2= Once a year or less, 3= Several times a year, 4= Once a month, 5= 2-3 times a month, 6= Once a week, 7= 2-3 times a week, 8= Daily. Paired samples t-tests were conducted to determine the effect of the course on the critic profile. Results showed a mean positive increase from 3.58 (SD = 1.08) to 3.90 (SD = .1.02), which was statistically significant $t(25)$ = -2.30, p < .01.

To examine the effect of teaching skills first versus last on the critic social technographic profile, an independent samples t-tests was conducted and found no statistically significant difference (p > .05) between the treatments on the critic profile post-test means.

Conclusions/Recommendations/Implications

Critical thinking scores essentially remained unchanged between pre- and post-test. This could be because changes in critical thinking dispositions occur over time (Irani et al., 2007). Perhaps a semester was not long enough for dispositions to change. Future studies should look at change in critical thinking skills not just dispositions, as critical thinking skills may be acquired quicker (Irani et al., 2007).

Although not statistically significant, it was interesting to note the decrease in attitude toward some new media, including total attitude. Students only provided an attitudinal response if they had experience with the task previously. Thus, this decrease could be because the source of the original attitudes is unknown, meaning students reacted solely to their personally-driven use of those tasks rather than business uses. Students may not have fully understood at the time of the pretest what was involved in these tasks from a business perspective. Using new media for a business is much more complex in terms of purpose, planning, and use. Therefore, the complexity involved in the tasks may have hindered attitudes. Also, students may have misunderstood what the new media tasks were initially, the course corrected the misunderstanding, and they discovered a less positive attitude toward.

While there was a positive increase in students' mean comfort levels of using technology after taking the course, the differences were not statistically significant. This may be explained by students all being communication majors, whom are inherently interested in technology and comfortable with its use. Moreover, research suggests prior attitudes and beliefs may hinder change particularly in relation to technology where preferences are already established (Hew & Brush, 2007).

Students' use of social media as critics increased as a result of the course. It would be useful to conduct an additional post-test a few months later to see if this trend continues. This finding shows students began engaging more in various social media through commenting and critiquing as a result of the course. If they continue on this trajectory of evaluating and critiquing information critically, they may develop better critical thinking skills (Astleitner, 2002).

The results of this study indicate no difference in student outcomes if the students learned strategy first and skills second or vice versa. This may be a result of the mix of students in the class and their upperclassman status. Students were all in the middle of the typical range for

critical thinking, meaning they had an adequate level of critical thinking skills throughout the course and may have been able to connect these concepts independently. Additionally, the students were all asked to utilize both skills and strategy in their final projects, which led them to process the two as an interrelated concept. This process may have allowed students to integrate the skills and strategy together as a single concept, which made the order unimportant. More research should be done to determine the effects of teaching order.

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The Marketing of Extension's Story: A Qualitative Study Assessing the Effectiveness of An Online Communication Campaign

Lauri M. Baker, *Kansas State University*
Jason D. Ellis, *Kansas State University*

Introduction

Previous marketing research of the land grant institution's outreach component indicates public relations efforts can maximize these outreach efforts (Baker, Abrams, Irani, & Meyers, 2011). While marketing primarily focuses on one-way communication supplemented with two-way communication to specific audiences, effective public relations involves developing relationships with clients and with strategic constituents, called "publics," such as governmental agencies, mass media and trade presses, financial publics, employees, and special interest groups (Grunig, 1997). The outreach component of the tripartite land grant mission has a cricial need for strategic communication with its publics (Telg, Irani, & Varvorines, 2011).

Review of Literature

Grunig and Hunt (1984) defined four models of public relations—press agentry; public information; two-way asymmetrical and two-way symmetrical. The public information model is characterized by using press releases and other one-way communication techniques to distribute organizational messages through in-house journalists. The two-way symmetrical model uses research with publics to facilitate understanding and communication. However, the two-way asymmetrical model (used in marketing) uses research to determine the messages most likely to persuade publics (as cited in Grunig & Grunig, 1992). "Organizations should practice two-way symmetrical communication when their environments are complex and turbulent" (Grunig & Grunig, 1992, p. 298). Based on needs assessments with publics and issues-based program development, two-way communication approaches may benefit land grant universities often in turbulent conditions (Donnellan & Montgomery, 2005).

Purpose & Objectives

This study is to determine how to effectively communicate what Extension is and does to a general audience.

The following objectives guided this study:

1. Determine effective channels of communication for sharing Extension's story.
2. Assess the feasibility of an online portal designed to share Extension impact stories.
3. Determine effective implementation strategies.

Methodology

Focus groups are used in marketing research studies because the researcher can determine emotional and unconscious motivations, which are sometimes difficult to assess in survey research (Morgan, 1998). This study used four focus groups, two for each of the target populations: Extension agents and Extension volunteers. A purposive sampling method was used

to gain participants from multiple areas of the state and from different levels within the organizational structure   . Participants were recruited through the appropriate organizational channels so focus groups could be conducted when groups were already scheduled to meet. The focus groups were conducted in August of 2011. The groups ranged from five to 10 participants, which is within the target number of four to 12 participants recommended for a homogenous group (Brown, 1999). A moderator's guide and questioning route were developed for the focus groups using the procedures set forth by Krueger (1998).

A website portal was developed to house stories about how Extension affected people's lives in a positive way. The site allowed people to post stories with pictures to share how Extension was making a difference and was evaluated by participants as part of the protocol procedure. The moderator's guide and questioning route that were reviewed by an expert panel for face and content validity were used to guide the discussion and to keep the focus groups consistent. Participants were asked initial questions about how they currently shared Extension's story and future ideas for how to market Extension. After these initial questions, participants were shown the online portal and were asked for feedback and improvements on this concept.

The same experienced, trained moderator was used for all four focus groups to ensure credibility. The focus groups were video and audio recorded for transcription. Participants' names were changed to protect their identity. Transcripts from the focus groups were imported into Weft QDA software to be analyzed for themes using Glaser's (1965) constant comparative method. The constant comparative method involves making comparisons between what is found to what was found prior in the analysis for every incident, allowing coding and analysis to occur simultaneously instead of coding and then analyzing (Glaser, 1965). The epistemological lens used for this study was that of people concerned with, but outside of, the industry of interest. Therefore, research and reports were able to be free of bias. However, epistemologically the researcher should try to get as close a possible to the subjects (Creswell, 2007). This was done in this study by the researchers developing a familiarly and trustworthiness with participants in the beginning of the sessions. Moreover, triangulation was used in this study, as it is recommended to gain a detailed and balanced depiction of the situation being investigated (Altrichter, Feldman, Posch, & Somekh, 2008). This consisted of multiple researchers analyzing transcripts to ensure validity of themes for confirmability. Additionally, to ensure veracity, an audit trail was kept and a member check was completed. Even though this study was with participants involved in Extension in one particular state, factors were similar to Extension issues in other states, and thus results may be transferrable to state Extension programs with similar characteristics.

Results

Objective 1: Determine effective channels of communication for sharing Extension's story.

Online. One of the strongest themes for an effective channel for sharing Extension's story was online. This came in many forms either by a website or existing social media platforms. Participants believed any site should be updated frequently and professionally. Lily noted, "It needs to be a top priority…." Several participants related the continuous updating to that of a blog. Robert communicated the possibilities of blogging by agents to market the news and stories by saying, "But if the Extension agents would blog news, I know our 4-H agent would…But she would text or Facebook our 4-H members. And the kids knew more and that is

the way they wanted to be reached." Participants continually expressed a need for interaction in this communication effort with blogs, Facebook, and texting being the most mentioned for how specific cliental wanted to be reached. Dean expressed this by saying "Facebook or that social media, you get the answer to your question before you ask it because they're telling you information all the time."

Radio and Television. Several participants felt that radio and television were great ways to broadcast Extension's message and impact. Many of them thought Public Service Announcements were the way to go. One participant had a specific example of how using radio and television could help extend Extension's impact. Dave noted that he frequently received calls from local farmers after listening to a statewide radio program talking about crops, and felt that it would be a good way for him to communicate to others. He said, "I'll frequently have farmers say, I was listening to the XYZ specialist talking about, soybean growth and develop better work. So, I think those are key educational opportunities." However other participants felt there was not accurate media coverage in their areas and that funds may not be available for such a communication effort.

Objective 2: Assess the feasibility of an online portal designed to share Extension impact stories.

Would not seek it out/difficult to find. There were mixed reactions about the feasibility of the online portal designed to share Extension impact stories. Some participants felt the site would not be sought out or used by people who were not involved with Extension. Beth spoke out about this concept by saying, "I don't think they would search it out…" Tony felt as though the purpose for the website was more designed towards people in the Extension field and it would be created for their own use and that others would not use it as a tool. He said, "In my experience of--it's not best, mind you--of websites and people developing websites, when websites are developed for the developer of the website no one goes to use them because it's not for them. I feel like this is that a little bit." He continued this thought by saying, "… I just don't see a whole lot of people using this enough to make it so that all the stories are relevant, all the stories stay current." Many other participants agreed that they would not spend a lot of time on the website and did not expect others to either. It would not be an effective tool for them to market the story if the audience is not seeking the information.

Needs Interactivity and Constant Change. If the website is created participants agreed unanimously that it needed updated frequently with a constant influx of new information. They wanted to see an abundance of interactivity, like video and comment capabilities, to draw in readers and keep them interested. They also believed that a site lacking interactivity and constant change could be detrimental to the story and marketability of Extension, especially with legislators. Denise wanted continuous change saying, "The other thing is if this comes up today and I go back to this website tomorrow, I don't want to see the same story. I want to see a change constantly." John felt it was extremely important to have information updated often and expressed this thought with, "If things aren't going up there almost every week or every two weeks, it's going to look old and dated." He said that if the website was marketed to legislators but was not kept current, then the congressmen and women could be disappointed if they visited the website and could not find information for their respective counties. Additionally,

participants were discouraged that the current site did not allow for comments or feedback on the posted stories.

Objective 3: Determine effective implementation strategies.

Facebook. Participants commonly discussed Facebook as a part of the promotional campaign for Extension's impacts. They found that using Facebook for the site, or putting information from the site onto Facebook, could greatly influence the impact of the effort. Sally said, "…I mean, I think most people don't want more than just a couple of sentences to read right now. Like the status line on Facebook. If they want more, they'll find more." There was also discussion on whether the site was up to date with technology and innovation if it was not integrated with Facebook in some way. Beth echoed these thoughts by saying, "my first thought is this graphic design does nothing to inspire me to do anything at all. It looks very dated to me." She then said the site had potential but needed to explore Facebook as a more viable option, "I think this concept may have some possibilities but if you do it this way--you need to give it the Facebook option."

Pictures and Video. Another heavily discussed implementation strategy was having more pictures and video and less text on the site. Several participants agreed by saying that the Internet was photo driven and people wanted to see what was actually happening. John stated this quite clearly by saying, "…the Internet is picture-based. They want to see the things happening." Sally suggested a way to do this, "I think a picture with a couple of lines with a link to a bigger story would be better." Pictures also could be used to highlight the key impact for the readers, which would help keep them interested and reading. Lily made this point clear by saying, "So I think something that gets their attention, highlights the key things at what you're really wanting to draw them into, whatever that success was, that people are going to keep reading and want to go back to that site."

Conclusions & Discussion

This study indicates that stakeholder groups prefer a communication campaign that focuses on two-way symmetrical communication, evidenced by participants' interest in utilizing Facebook in some way. The most dominant theme for how to communicate the impact of Extension was through online communication, which has more capacity for two-way symmetrical communication via interactive elements. Participants' analysis of the current portal was more indicative of asymmetrical two-way communication. Their comments were supportive of a more symmetrical model; allowing for continual feedback and interaction rather than just posted success stories.

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Teaching Difficult Science Concepts to Introductory College Freshmen: Faculty Voices

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Introduction

There exists an urgent need to attract and develop the next generation of agricultural scientists, (Association of Public and Land-grant Universities, Experiment Station Committee on Organization and Policy—Science and Technology Committee, 2010). This urgency is predicated by projections indicating that STEM occupations are expected to grow in the years 2008-2018 by 17%, doubling the rate from the previous decade (U. S. Department of Commerce, 2011). These projections leave industry professionals questioning the ability of the U. S. workforce to meet the global demands of the 21st century (Chen, 2009). Their questions are valid when examining the minimal number of college students declaring STEM majors (Chen, 2009; Duncan, 2009) furthering the concern that a lag in the development of skilled STEM professionals has serious implications for the future of the U. S. economy within the global marketplace.

The American Association for Agricultural Education's (AAAE) National Research Agenda (Doerfert, 2011) identifies the need for a [s]ufficient scientific and professional workforce that addresses challenges of the 21st century as a national priority. The association recognizes the need to "[d]evelop models, strategies, and tactics that best prepare, promote, and retain new professionals who demonstrate content knowledge [and] technical competence" (p. 9). They also recognize that STEM coursework which is engaging, applicable, learner-centered, and relevant can increase both student motivation and knowledge retention (Estes, 2004). Therefore, it is the focus of this project to examine how university faculty, teaching introductory agriscience courses, identify challenging science concepts for students in animal, food and horticultural science courses, and to reflect on their own ability to teach these concepts to their students.

Theoretical Framework

Researchers utilized Lortie's theory of apprenticeship of observation (1975). Lortie posits that unlike many other occupations, teachers' socialization into the profession starts when they are students. As a result, beginning teachers perpetuate their educational experience at the expense of reflective and proven theory and best practice. This theory has large implications when applied to university educators, many with no formal education in the teaching and learning process and who were trained in a heavily lecture based educational system (Estes, 2004).

Purpose and Research Questions

Researchers sought to determine difficult science concepts taught in introductory agriscience college courses as identified by university faculty. And, to examine the teaching strategies employed by faculty to navigate the process of teaching difficult science concepts to first-year students. The specific research questions were:

1. What are the difficult science concepts that first year college students face in introductory animal science, food science and horticultural science college courses as identified by the faculty teaching the courses?

2. How do the university faculty effectively teach difficult science concepts to first year college students in introductory animal science, food science and horticultural science courses?

Methods/Procedures

This qualitative study involved seven university faculty, teaching courses in one of three domains – animal science, food science or horticultural science – in two separate land grant universities in two different states. Individual, face-to-face interviews were conducted with each faculty member in their individual office utilizing a semi-structured interview guide comprised of questions developed by university faculty with expertise in teaching and learning. To be consistent, one interviewer conducted all interviews. Data generated from personal interviews were analyzed using open and axial coding. Next, central concepts, main ideas, and related responses were analyzed to create thematic categories (Glesne, 1999). Trustworthiness and confirmability were established by continuously returning to the original data and clarifying responses from faculty participants (Denzin, 1984). Furthermore, researchers triangulated data through peer debriefing, audit trails, interviewer notes, and reflexive journaling (Donmoyer, 2001; Lincoln and Guba, 1985).

Findings/Results

Research question one sought to determine the difficult science concepts first year college students face in introductory animal science, food science and horticultural science college courses as identified by the faculty teaching the courses. Table 1 summarizes faculty perceptions of the difficult science concepts within their respective courses.

Table 1

Difficult Science Concepts as Identified by Faculty

Introductory Agriscience Course	Instructor	Difficult Science Concepts
Animal Science	A1	Nutrition, digestion, digestion physiology in ruminants
	A2	Inability to distinguish between ruminant and monogastric digestion
Food Science	F1	Safe food processing & decision science regarding food quality
	F2	Thermal processing & logarithmic order of death of orgranisms
Horticultural Science	H1	Differences between monocotyledons and dicotyledons
	H2	Respiration and photosynthesis, mineral movement through plants, and plant physiology
	H3	Plants are dissimilar to animals, and plant reproduction

Faculty were given a letter and number to maintain anonymity.

All faculty members included in the study were able to identify at least two challenging scientific concepts that the students in their introductory science courses struggled with.

Research question two determined techniques for teaching difficult science concepts to first year college students in introductory animal science, food science and horticultural science courses. Through face-to-face interviews the faculty provided the following responses (Table 2):

Table 2

Faculty Teaching Methods

Interview question 1: Why do you choose the teaching methods [you use] to teach this course?

Prof. A2   Well, I think there are a number of things. Number one, I found useful some things I learned as a student from the instructors I had related to well. Those instructors I felt I had learned the most from. I took the things that I have learned the most from them. I do some things that more or less come to me naturally, or that are kind of easy for me, and seem to work well. So it's mostly just watching others or what I think is good to pick from them and I guess that's it.

Prof. F2   I don't know if it's because I choose to use them. I never really was taught how to teach. I mean, I had finished my master's degree when I was asked to teach a 300 student lecture course because my former supervisor was going on sabbatical. And, he trusted me, and I was his TA (teaching assistant) for that course so he knew I could do it. And he said here are my overheads- the course is yours. And, he never got it back. I kept it since then. So, I just followed, I think, seeing how he taught. I think I learned from watching him teach. And I liked how he taught, and how the students laughed in his class and enjoyed it. And even though he was tough, you know the exams were tough and the expectations were high, but the students enjoyed it. So I tried to follow some of what I saw in him.

Prof. H1   Lecture is how I was taught. It's easy, it's efficient, it puts the information out there because with a large class size, you're a conveyer of information. It's not like I have 20 kids and can sit around and have a discussion and wander off on a tangent and come back and still have enough time to make sure we cover the content, which I can do to some extent to my lab. Which is why I enjoy teaching that lab section because I have a little more flexibility. When you've got 110 of them and you've got to get through x, y, and z by the end of the semester, you kind of have a set order and pattern for doing that. Some of the other things, the bringing in the case studies, the activities, the discussion, a lot of that had been self taught from reading methods articles. For me, one of the big professional development things has been the National Science Teachers Association. They have some great books. They have the Journal of College Science Teaching, looking at some of that stuff, hanging out with all the guys from agricultural education. When we moved agricultural education into the department, voilà! Look, I have all these people who know how to teach, would you teach me something? You know, trying things, reading things, hearing things, going to the center for instructional excellence workshops and hearing some of the cool things some people are doing and then trying to bring that back to try it out. And the class was given to me as 'here's your pile of PowerPoints.

Table 2 (Continued)

Faculty Teaching Methods

Prof. H3	There are a couple of reasons that I choose them and largely they're the methods that were used by my previous professors that I found to be effective. I can name all of the professors that had a large impact on me. One of them actually wrote a book on pedagogy and his name was Dr. Lensen and he was a cell biology professor when I was an undergrad. He just cared a great deal about teaching and he was the first one who pushed me on this path of teaching because in that class he decided to start holding recitation sessions. But there were no grad students to do that so he used students who had taken his class previously and had done well to lead these recitation sessions. That was my first experience of having people ask me questions and you'd just go, "Wow, this is great, I'm having people ask me questions that I know exactly what you were wondering when you were in my shoes and now I'm able to help you," and that was great.

Due to page limitations, representative data was presented.

Conclusions, Recommendations, Discussion/Implications

This study revealed that university faculty teaching introductory science courses were able to identify the difficult science concepts that their students struggled with the most to learn. Concepts of nutrition, digestion, and digestive physiology in ruminants and monogastrics (animal science); safe food processing, decision science related to food quality, thermal processing and the logarithmic order of death of organisms (food science); and, the differences between monocotyledons and dicotyledons, respiration and photosynthesis, mineral movement through plants, plant physiology, how plants are dissimilar to animals, and plant reproduction (horticultural science) were identified by the seven faculty interviewed.

Consistent with Lortie's theory of apprenticeship of observation (1975), the teaching strategies employed by the faculty were largely influenced by the "way they were taught". The teaching methods highlighted included lecture, small group laboratory experience, question and answer, case studies, activities, and discussion. In five of the seven faculty cases they were "thrown into" their first teaching assignment with little time to prepare, few resources, and no teaching mentor provided. One faculty member with no formal preparation in teaching reflected on student performance and interest as the motivation to pursue effective teaching strategies. As a result, this faculty member became a member of a professional teaching association, accessed a scholarly journal about teaching science, participated in their university's center for instructional excellence and sought out assistance from the formally trained agricultural education teacher preparation faculty within the department.

Based upon the importance of providing high quality instruction in STEM related fields, this study provides evidence for engaging university teaching faculty in a systematic process of professional development surrounding the teaching and learning process. For the particular context of animal, plant and horticultural science used in this study, the results suggest that agricultural education teacher preparation faculty, membership in professional teaching

associations and local centers for teaching excellence can provide helpful resources for the improvement of teaching in science related fields.

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Use of Experiential Learning in 4-H Clubs: Implications for 4-H Programs

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Introduction and Conceptual Framework

The National 4-H organization is based on "learning by doing". The idea of learning through an experience is a major component of the experiential learning process. By understanding the process of experiential learning, individuals will be able to more successfully implement experiential learning within 4-H clubs. The 4-H has a long history of dedication to hands-on learning. The National 4-H Organization has developed an experiential learning model based on the works of Kolb and that of Pfeiffer and Jones (Enfield, 2001; Enfield et al., 2007). A comparison of three relevant experiential learning models, and their connection to the 4-H model of *Do, Reflect, Apply*, is displayed in Figure 1.
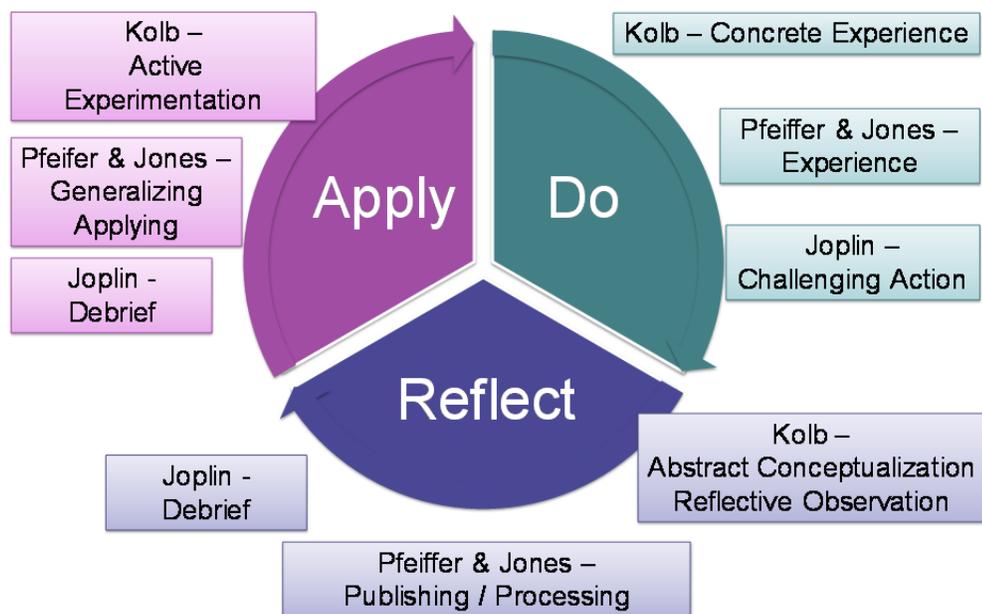
Figure 1 Comparison of experiential learning models.

Kolb, D. A. (1984) *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice-Hall, Inc.
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The beginning of hands-on 4-H learning started with the corn clubs and tomato clubs where youth were involved in creating a physical end product (Enfield, 2001). The experience

component has now evolved into the *Do, Reflect, Apply* experiential learning model (Enfield, 2001). The experiential learning model is used in 4-H because it is relatable, supports different learning styles, encourages discovery of knowledge, and helps draw conclusions (University of Arkansas, n.d). Besides the skills directly related to the cycle, it also encourages life-skills such as teamwork, communication, problem solving, decision making and self-directed learning (Enfield, 2001; University of Arkansas, n.d). To successfully incorporate experiential learning into 4-H programming, adult and teen leaders need to support an environment for exploration (Carlson & Maxa, 1998). These individuals help youth develop new knowledge through guiding questions, limiting directions, and encouraging reflection (Enfield, 2001). Experiential learning also requires active cooperation from the youth, which can be challenging at times (Carlson & Maxa, 1998).

Through the use of experiential learning, youth are put in control of their education by experiencing the material first hand, while being given opportunities to find how their discoveries relate to what they already know (Arnold, Warner, & Osborne, 2006). To help 4-H leaders understand the value and process of experiential learning, training sessions need to be utilized (McKee, Talbert & Barkman 2002). In a survey by Diem (2009), experiential learning was one of the top five categories in which volunteers wanted more information. Pennsylvania 4-H staff offered training for volunteers approximately five years ago (Dr. Claudia Mincemoyer, personal communication, November 11, 2010).

Purpose and Objectives

The purpose of this study was to determine the perceived knowledge, use and effectiveness of experiential learning in 4-H clubs in Pennsylvania 4-H. The following objectives guided the study:

1. Describe the demographics of Pennsylvania 4-H youth Extension educators and 4-H volunteer leaders.

2. Determine the level of training received by Pennsylvania youth Extension educators and 4-H volunteers trained in the 4-H model of experiential learning.

3. Explore the perceived knowledge of experiential learning within Pennsylvania 4-H clubs.

4. Explore the perceived use of experiential learning within Pennsylvania 4-H clubs.

5. Determine the differences, if any, in perceived knowledge of experiential learning between Pennsylvania 4-H Extension educators and Pennsylvania 4-H volunteer leaders.

Methods and Procedures

Study Participants

Following university IRB approval for the study, Extension educators and volunteer leaders in Pennsylvania were asked to participate in this experiential learning study. In Pennsylvania there were 76 Extension educators with a direct 4-H appointment. Due to this small number a complete census was used. Volunteer leaders were surveyed using a proportional stratified random selection process, by region of the state. Pennsylvania uses an online enrollment system with an individuals' name, county and contact information. A total of 3,444 volunteer leader entries were identified as the target population for the study. Using Krejcie and Morgan's (1970) sampling strategy, a sample of 346 volunteers were randomly selected to participate in the study.

Instrumentation, Data Collection and Analysis

An online survey was developed based on a review of literature with input from state staff and youth development researchers. The survey had questions in the format of yes/no, multiple choice, Likert-Type items and open ended responses. The questions on the survey focused around familiarity with terms associated with experiential learning. Survey respondents were also asked how frequently they utilized different learning methods that are often associated with experiential learning. For some topics, Extension educators were asked how they perceived the volunteer leaders within their counties utilize or understand experiential learning. Following a review by a panel of experts from the Department of Agricultural and Extension Education, a pilot test was conducted and found to have no unanticipated results. Cronbach's alpha for Likert-type items was found to be acceptable (0.82).

An on-line survey methodology based on Dillman (2000) procedures was used to collect data. The first contact with the sample population was a recruitment email with the survey link. Seven to ten days later a reminder was sent to those who had not yet completed the survey. Another reminder was sent out 7 to 10 days following the first reminder, and again, only to those who had not yet responded. The final notice was sent 7 days after the third contact with the sample group. For the 4-H volunteer leader sample, 10% of non-respondents were chosen using proportional stratified random sampling to receive this final notice. The usable response rate was 68.4% for Extension educators and 26.6% for volunteer leaders, with an overall response rate of 34.1%. Data gathered from the survey was analyzed using means, frequencies, standard deviations and independent t-tests in SPSS version 19.

Results

The demographic profile of a respondent was a white female with a four year degree. The Extension educators had less than 15 years of experience and the volunteer leaders had less than 10 years of experience working with the 4-H program. The Extension educators who completed this survey represented all project types available in the 4-H program. The most popular project type worked with was *Animals*, with 93.9% of Extension educators (n=46) and 83.1% of volunteer leaders (n=74) indicating participation.

Approximately 56% (n=29) of Extension educators offered more than 2 general workshops or training sessions each year and 42.3% (n=22) offer 1 or 2 per year. To determine if volunteer leaders were taking advantage of these educational opportunities, the volunteer leaders were asked how frequently they attend a general workshop or training session offered through the Extension system. Approximately 47% (n=43) of volunteer leaders attended 1 or 2 workshops or sessions each year, but 43.5% (n=40) of volunteer leaders attended less than 1 per year.

To determine the level of training in experiential learning, both groups of participants were asked if they had received any training in experiential learning at some point in their careers. Of the Extension educators, 71.2% (n=37) said *Yes* and 16.3% (n=15) of volunteer leaders replied *Yes* to specific experiential learning training.

It was found that 64.7% (n=33) of Extension educators offered some type of experiential learning training program for 4-H volunteers. While many training opportunities were offered, only 13.0% (n=12) of volunteer leaders indicated attending an experiential learning training program through the Extension system. Twenty-four Extension educators (72.7%) and eight volunteer leaders (66.7%) reported offering or attending an experiential learning session that was offered through Extension within the past year.

Of the Extension educators who responded to this survey, approximately 96% (n=49) were familiar with the term experiential learning. However, only 47.8% (n=44) of volunteer leaders indicated familiarity with the experiential learning term. To determine if any significant differences in knowledge of experiential learning existed between Extension educators and volunteer leaders, an independent t-test of five statements related to experiential learning was conducted. After calculating a mean score for each respondent and evaluating the two groups with an independent t-test, there was no significant difference found between the survey respondent groups as the p-value was 0.542.

The final evaluation for perceived knowledge was completed by asking the Extension educators to estimate how many of the volunteer leaders they work with are aware of the 4-H learning process *Do, Reflect, Apply*. Approximately 60% (n=31) of the Extension educators believed that *Most* or *Nearly All* of the leaders were aware of the *Do, Reflect, Apply* process. The volunteer leaders were asked if they had heard the *Do, Reflect, Apply* in association with the 4-H learning process. The survey results showed that 37.5% (n=33) of volunteer leaders are familiar with *Do, Reflect, Apply* and 4-H learning. When the volunteer leaders were asked to rank the following statement "I understand what the terms *Do, Reflect, Apply* mean related to the 4-H learning" on a scale of *Strongly Disagree* to *Strongly Agree*, the category with the most responses was *Agree* (42.9%, n=39).

The evaluation for the perceived use of experiential learning was conducted by volunteer leaders identifying the frequency, *Almost Never* to *Always*, at which different techniques of experiential learning were used within club activities. The response category of *Frequently*, or 75 to 99% of the time within club activities, received the highest overall percentage of responses (41.8%, n=342). The statements that had over 45% of volunteer leaders indicate *Frequently* were: *I provide hands-on activities for youth; I support youth as they direct their own learning; I ask youth questions during activities such as who, what, why, when, where; I encourage youth to have group discussions about experiences.* The statement that received the lowest number

(27.5%, n= 25) of *Frequently* responses was *I provide opportunities for youth to practice their new skills in another setting*.

Conclusions and Recommendations

Experiential learning is a critical part of learning within 4-H, and it is built into every workbook offered through the National 4-H Curriculum program. Extension educators, when compared to volunteer leaders, are typically more familiar with experiential learning terminology and its value in the youth learning process. As found through this research study, very few volunteer leaders have been trained on how to correctly use experiential learning within their local 4-H clubs. This low level of training may be influencing the volunteer leaders' level of knowledge about experiential learning. Less than 50% of volunteer leaders are familiar with the term of experiential learning or understand how the phrase *Do, Reflect, Apply* relates to 4-H learning.

Even though the volunteer leaders expressed a low level of knowledge about experiential learning, these same volunteer leaders reported that experiential learning was prominent within club activities. Extension educators perceived a lower level of use of experiential learning techniques by their volunteer leaders when compared to the level of use reported by the volunteer leaders. This difference may be due to a lack of communication between the two groups of individuals of what is actually happening within the club activities, or an overall knowledge gap in the understanding of the experiential learning process.

In order to increase volunteer leaders' knowledge and use of experiential learning within Pennsylvania 4-H programming, Extension educators need to reach out to the volunteer leaders within their counties. A concerted effort must be made to be certain that all 4-H volunteers understand the importance of the experiential learning model that is espoused by the National 4-H Organization. Volunteers need to be trained in the proper use of the model. The potential learning benefits of using the model must also be impressed upon those that work with 4-H youth. Small steps in reducing this knowledge deficit could include the development of online training or fact sheets related to experiential learning, and the impact that it can have on member learning when properly implemented. The 4-H staff should also consider future research opportunities, such as case studies, interviews, focus groups, and direct observations of club activities to determine if the complete experiential learning model is being utilized within 4-H club activities.

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Reflecting On Experience: The Impact of Reflection Following FFA Civic Engagement Activities

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Literature Review / Theoretical Framework

Civic engagement activities unite human efforts and resources toward identifying and correcting existing community problems (Adler & Goggin, 2005; Camino & Zeldin, 2002; Diller, 2001; Jans, 2004). Educators throughout the United States routinely utilize civic engagement activities to enhance students' content knowledge, develop citizenship skills, amd simultaneously strengthen their community's status (Sherrod, 2005; Yates & Youniss, 1999; Youniss & Yates, 1997). FFA chapters throughout the U.S. provide numerous civic engagement involvement opportunities for youth, commonly offered as community based service learning projects (National FFA Organization, 2011; Ricketts & Ricketts, 2011); FFA civic engagement activities potentially enhance agriculture students' sense of civic responsibility (Brandell & Hinck, 2005; Skinner & Chapman, 1999).

The researchers developed a theoretical model (Figure 1) framed within existing youth development and civic engagement literature to guide the current investigation. First, civic responsibility encompasses three dimensions: an individual's connection to the community, awareness of existing community needs, and civic efficacy (Balsano, 2005; Evans & Prilleltensky, 2005; Furco, Muller, & Ammons, 1998). Second, civic engagement activities should include a post-activity reflection component (Waterman, 1997). Post-civic engagement reflection enhances youths' conceptualization of the civic engagement experience, realization of civic impact, and transfer of knowledge to future civic situations (Bringle & Hatcher, 1999). If civic engagement experinces lack reflection, students may not reach their full developmental potential (Blyth, Saito, & Berkas, 1997; Hatcher & Bringle, 1997). The utilization and effect of reflection within FFA civic engagement programming holds great potential but remains largely unexplored.
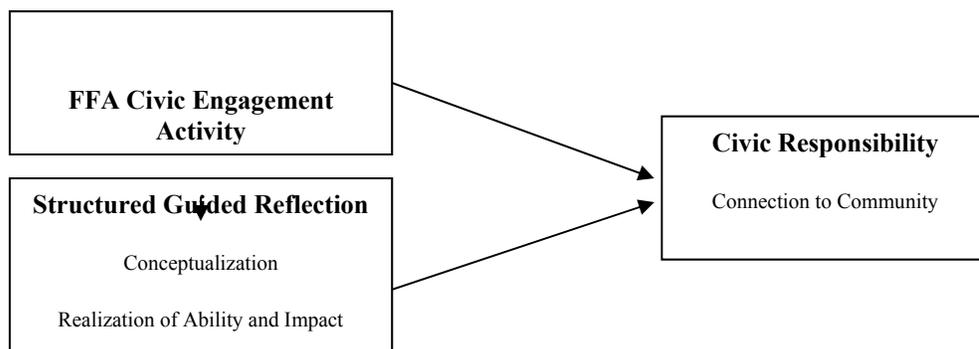

Figure 1. Theoretical model of critical components during FFA civic engagement activities.

Purpose

The purpose of this study was to determine the influence of guided reflection following FFA civic engagement activities on students' self-perceived civic responsibility. The research specifically addressed the National Research Agenda Research Priority Area 6: Vibrant, Resilient Communities focusing the inquiry to, "Design and test models for increasing civic engagement in local communities and for increasing the social capital of local communities" (Doerfert, 2011, p.10). The following research objectives and hypotheses were generated to guide the study:

1. Describe students' self-perceived levels of civic responsibility.
2. Compare the effect of post-civic engagement reflection on students' levels of civic responsibility.

H_1: $\mu_{\text{Reflection}} > \mu_{\text{No reflection}}$

Methods

This study utilized a quasi-experimental, nonequivalent control group pretest-posttest design (Ary, Jacobs, & Sorensen, 2010; Shadish, Cook, & Campbell, 2002). The design utilized four data collection points: November 2010, May 2011, November 2011, and March 2012. Data were gathered on the same unit of student subjects making it a dependent samples design. Four schools participated because they consistently provided FFA sponsored civic engagement activities lacking a reflection component. Two FFA chapters were randomly assigned to provide a group discussion format reflection following FFA civic engagement activities after time period three; the other two FFA chapters continued providing FFA civic engagement activities without reflection. The participating schools provided the researcher an accepting sample of 372 students. Students who participated in FFA civic engagement activities before and after the treatment assignment ($n = 138$) were the final usable sample. These students were viewed as a time and place samples and results were deemed inferable to past and future individuals within the four FFA chapters (Oliver & Hinkle, 1982). Respondents self-reported themselves as mostly 15 years old, male, in 9th grade, white, lived on a rural farm, and had grades of mostly A's and B's.

The teacher-facilitated reflection treatment protocol was adapted from the Six Step Civic Reflection Process (Bradley, 1997) and provided a consistent treatment among treatment group subjects. Data were collected using a paper and pencil form of the Civic Responsibility Scale (Furco et al., 1998) to measures students' levels of self-perceived civic responsibility. A panel of seven experts recommended changes to enhance face and content validity of the instrument. A pilot test ($n = 28$) with a similar population not included in the study revealed acceptable Chronbach's alpha reliability estimates ranging from .72 to .93 (Nunnally, 1978). Prior to data collection, required permission for subject involvement was obtained from students, teachers, school administrators, and the Missouri Campus Institutional Review Board.

Research objective one described students' levels of civic responsibility during each data collection time period. As shown in Table 1, students slightly agreed they had feelings of connection to the community ($M = 4.47$; $SD = .85$), community needs awareness ($M = 3.98$; $SD = .91$), and civic efficacy ($M = 3.86$; $SD = 1.00$).

Table 1

Summated Levels of Students' Civic Responsibility Among All Schools ($n = 138$)

	Pre-experimental			Post-experimental	Total
	Nov. 2010	May 2011	Nov. 2011	March 2012	Total
Civic Responsibility Construct	($n = 138$)	($n = 138$)	($n = 138$)	($n = 138$)	($n = 138$)
	M *SD*	*M* *SD*	*M* *SD*	*M* *SD*	*M* *SD*
Connection to the Community	4.66 .84	4.49 .95	4.38 1.00	4.43 1.07	4.47 .85
Community Needs Awareness	4.09 .91	3.99 1.04	3.92 1.06	4.02 1.13	3.98 .91
Civic Efficacy	3.96 1.04	3.83 1.14	3.79 1.19	3.93 1.20	3.86 1.00

Note. Coded: 1 – 1.50 = *Strongly Disagree*, 1.51 – 2.50 = *Disagree*, 2.51 – 3.50 = *Slightly Disagree*, 3.51 – 4.50 = *Slightly Agree*, 4.51 – 5.50 = *Agree*, and 5.51 – 6 = *Strongly Agree*.

Objective two compared the effect of a post-civic engagement reflection on students' civic responsibility. The researcher used Analyses of Covariance (ANCOVA) to compare group mean scores and test the null hypothesis. Civic responsibility scores for time periods one through three were collapsed into a single pre-experimental civic responsibility score for

comparison to the single post-experimental civic responsibility score. Summary statistics for treatment groups were calculated for comparison of all subjects (n = 138).

Connection to Community

As shown in Table 2, students in the no reflection group had an overall pre-experimental connection to community construct mean score of 4.66 (SD = .78) and an overall post-experimental connection to community construct mean score of 4.50 (SD = .98). Students in the reflection group had an overall pre-experimental connection to community construct mean score of 4.68 (SD = .75) and an overall post-experimental connection to community construct mean score of 4.71 (SD = .94).

Table 2

Comparison of Connection to Community Construct Mean Scores between Groups (n = 138)

| | | Pre-experimental | | | | Post-experimental | | | |
| | | | | Range | | | | Range | |
Group	n	M	SD	Min	Max	M	SD	Min	Max
No Reflection	53	4.66	.78	1.00	6.00	4.50	.98	1.00	6.00
Reflection	85	4.68	.73	1.00	6.00	4.71	.94	1.00	6.00
Total	138	4.67	.75	1.00	6.00	4.63	.96	1.00	6.00

Note. Coded: 1 – 1.50 = *Strongly Disagree*, 1.51 – 2.50 = *Disagree*, 2.51 – 3.50 = *Slightly Disagree*, 3.51 – 4.50 = *Slightly Agree*, 4.51 – 5.50 = *Agree*, and 5.51 – 6 = *Strongly Agree*.

The null hypothesis for the connection to community construct was tested using ANCOVA and used students' pre-experimental connection to community construct scores as the covariate. The F-value ($F_{2,135}$ = 2.52, p = .12) was not statistically significant, indicating there was no difference among students' connection to community construct scores between treatment groups when controlling for pre-experimental connection to community construct scores.

Community Needs Awareness

As shown in Table 3, students in the no reflection group had an overall pre-experimental community needs awareness construct mean score of 4.20 (SD = .85) and an overall post-experimental community needs awareness construct mean score of 4.10 (SD = 1.07). Students in the reflection group had an overall pre-experimental community needs awareness construct mean

score of 4.23 (*SD* = .74) and an overall post-experimental community needs awareness construct mean score of 4.41 (*SD* = 1.03).

Table 3

Comparison of Community Needs Awareness Construct Mean Scores between Groups (*n* = 138)

| | | Pre-experimental | | | | Post-experimental | | | |
| | | | | Range | | | | Range | |
Group	*n*	*M*	*SD*	Min	Max	*M*	*SD*	Min	Max
No Reflection	53	4.20	.85	1.00	6.00	4.10	1.07	1.00	6.00
Reflection	85	4.23	.74	1.00	6.00	4.41	1.03	1.00	6.00
Total	138	4.22	.78	1.00	6.00	4.30	1.05	1.00	6.00

Note. Coded: 1 – 1.50 = *Strongly Disagree*, 1.51 – 2.50 = *Disagree*, 2.51 – 3.50 = *Slightly Disagree*, 3.51 – 4.50 = *Slightly Agree*, 4.51 – 5.50 = *Agree*, and 5.51 – 6 = *Strongly Agree*.

The null hypothesis for the community needs awareness construct was tested using ANCOVA and used students' pre-experimental community needs awareness construct scores as the covariate. The F-value ($F_{2,135}$ = 4.44, *p* = .04) was statistically significant, indicating a significant difference existed among students' community needs awareness construct scores between treatment groups when controlling for pre-experimental community needs awareness construct scores.

Civic Efficacy

As shown in Table 4, students in the no reflection group had an overall pre-experimental civic efficacy construct mean score of 4.15 (*SD* = .89) and an overall post-experimental civic efficacy construct mean score of 4.11 (*SD* = 1.05). Students in the reflection group had an overall pre-experimental civic efficacy construct mean score of 4.10 (*SD* = .93) and an overall post-experimental civic efficacy construct mean score of 4.35 (*SD* = 1.12).

Table 4

Comparison of Civic Efficacy Construct Mean Scores between Groups (*n* = 138)

| Group | *n* | Pre-experimental | | | | Post-experimental | | | |
| | | *M* | *SD* | Min | Max | *M* | *SD* | Min | Max |
				Range				Range	
No Reflection	53	4.15	.89	1.00	6.00	4.11	1.05	1.00	6.00
Reflection	85	4.10	.93	1.00	6.00	4.35	1.12	1.00	6.00
Total	138	4.12	.91	1.00	6.00	4.26	1.09	1.00	6.00

Note. Coded: 1 – 1.50 = *Strongly Disagree*, 1.51 – 2.50 = *Disagree*, 2.51 – 3.50 = *Slightly Disagree*, 3.51 – 4.50 = *Slightly Agree*, 4.51 – 5.50 = *Agree*, and 5.51 – 6 = *Strongly Agree*.

The null hypothesis for the civic efficacy construct was tested using ANCOVA and used students' pre-experimental civic efficacy construct scores as the covariate. The F-value ($F_{2,135}$ = 5.02, p = .03) was statistically significant, indicating a significant difference existed among students' civic efficacy construct scores between treatment groups when controlling for pre-experimental civic efficacy construct scores.

The null hypothesis stating that no difference existed between groups level of civic responsibility was rejected in favor of the research hypothesis. Summary statistics for treatment group comparisons indicated students who participated in FFA civic engagement activities and also experienced post-civic engagement reflection had significantly higher levels of civic responsibility.

Discussion

For objective one, students slightly agreed with feeling connected to their community, an awareness of community needs, and civic efficacy. Civic responsibility scores decreased throughout the first three time periods but increased from time period three to four. It was concluded that students' sense of civic responsibility can change positively or negatively over time. Research indicates that adolescent youth may naturally become more self-critical of their own civic abilities with age (Levine & Higgins-D'Alessandro, 2010). Interestingly, once reflection components were established, students' civic responsibility scores began to increase. An alternative explanation could be that post-civic engagement reflection reinforces students' civic self-perceptions (Blyth et al., 1997). This conclusion implies that civic engagement activities lacking reflection may not enhance youths' civic responsibility. However, civic

responsibility is but one operational definition of desirable civic attitudes. Future researchers should consider other dimensions of civic attitudes for investigation.

For objective two, control and treatment groups exhibited similar pre-experimental scores for each civic responsibility construct. Students in the reflection group displayed higher civic responsibility scores than the no reflection group during the post-experimental time period. Moreover, the no reflection group students' civic responsibility scores decreased between treatment periods for each construct. It was concluded that students who experience reflection following FFA civic engagement activities demonstrate higher levels of civic responsibility than students who do not experience reflection. This conclusion supports the work of numerous civic engagement scholars (Bringle & Hatcher, 1999; Camino & Zeldin, 2002; Conway, Amel, & Gerwein, 2009; Stafford, Boyd, & Lindner, 2003; Terry & Bohnenberger, 2004; Youniss & Yates, 1997) and supports increased reflection implementation within FFA civic engagement programming.

It can be implied that reflection enhanced youths' self-perceived civic responsibility. However, the treatment lasted only four months. FFA civic engagement programming could be more impactful with reflection offered during longer periods of time (Bringle & Hatcher, 1999; Waterman, 1997). This implication leads to several practical recommendations. Educators should incorporate reflection activities such as group or one-on-one discussions, presentations, or journals following students' civic engagement experiences. Secondly, the National FFA Organization and teachers educators should encourage the use of reflection as a pedagogical tool and provide reflection resources including online reflection strategies, reflection protocols, or other reflection plans of action. FFA sponsored civic engagement efforts intend to help youth become positive community members. Reflection following FFA civic engagement activities provides a simple, yet crucial step in more effectively reaching that objective.

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Factors Influencing Preservice Teachers' Decisions to Participate in an Early Field Experience Abroad

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Introduction

Modern society is experiencing drastic cultural changes due to globalization as a result of advancements in technological, political, cultural, economic, and ecological systems (Daggett, 2005; Wingenbach, Chmielewski, Smith, Pina Jr., & Hamilton, 2006). With increased globalization, the topic of internationalizing educational curricula so that students are exposed to cultural and social diversity and are able to work productively in the global agricultural system has been a part of higher education discourse for more than 30 years (Daggett, 2005; Navarro, 2004; Wingenbach et al., 2006; Zhai & Scheer, 2002). One method of effective exposure discussed pertains to substantive global interaction and travel (Webster & Hoover, 2006). The foundation for this exposure includes full engagement, reflection, conceptualization, and self-initiated experimentation during the experiences (Andreasen & Wu, 1999; Kolb, 1984). To this end, educators can be instrumental in providing substantive global experiences for students (Webster & Hoover, 2006). However, the educator facilitating the experience must too be equipped with the knowledge and skills to work in said environments (Boyle-Baise & Kilbane, 2000). One way to prepare teachers for the diverse workforce and facilitating internationalization in the classroom is through authentic immersion activities prior to entering the profession (O'Grady, 2000; Suarez, 2003; Webster & Hoover, 2006).

Purpose and Objectives

The purpose of this study was to identify factors that impact preservice teachers' motivation to actively engage in an early field experience abroad and how the structure of the experience impacts their perceptions about cultural diversity and their likelihood to continue global engagement. This study was guided by the following objectives:

1. Describe the personal characteristics of the participants and motivation to participate in the field experience abroad;
2. Describe the factors within the field experience that fulfilled the participants' basic psychological needs as perceived by the participants; and
3. Describe participants' perceptions about cultural diversity and likelihood to continue global engagement after the field experience abroad.

Conceptual Framework

The conceptual framework for this study is Anderson (2007) organismic social cognitive perspective (OSCP) model (see Figure 1). This model borrows from Bandura's (1986) model of triadic reciprocality; however, instead of *self-efficacy* as the key variable for motivating the student, the OSCP model uses *self-determination* from an organismic-dialectical perspective to explain personal factors of motivation (Deci & Ryan, 2002). The organismic perspective purports that there exists an innate human drive for psychological growth based on the

satisfaction of three basic needs: *autonomy*, *competence*, and *relatedness*. The development of the new model was done to address the limitations of self-efficacy in that self-efficacy focuses specifically on the extent to which people believe they are capable of engaging in behaviors that would lead to desired outcomes (Deci & Ryan, 2000). This belief of self-capability was formed by past extrinsic rewards or consequences and is driven by the desire to either obtain more rewards or avoid consequences. Unfortunately, this assertion does not take into account the complexity of motivation by addressing the different forms of motivation (Deci & Ryan, 2000). As it relates to this study, the OSCP model demonstrates the dynamics between personal factors and environmental factors that influence individuals' participation in early field experiences abroad and encourage sustained engagement during and beyond the field experience.
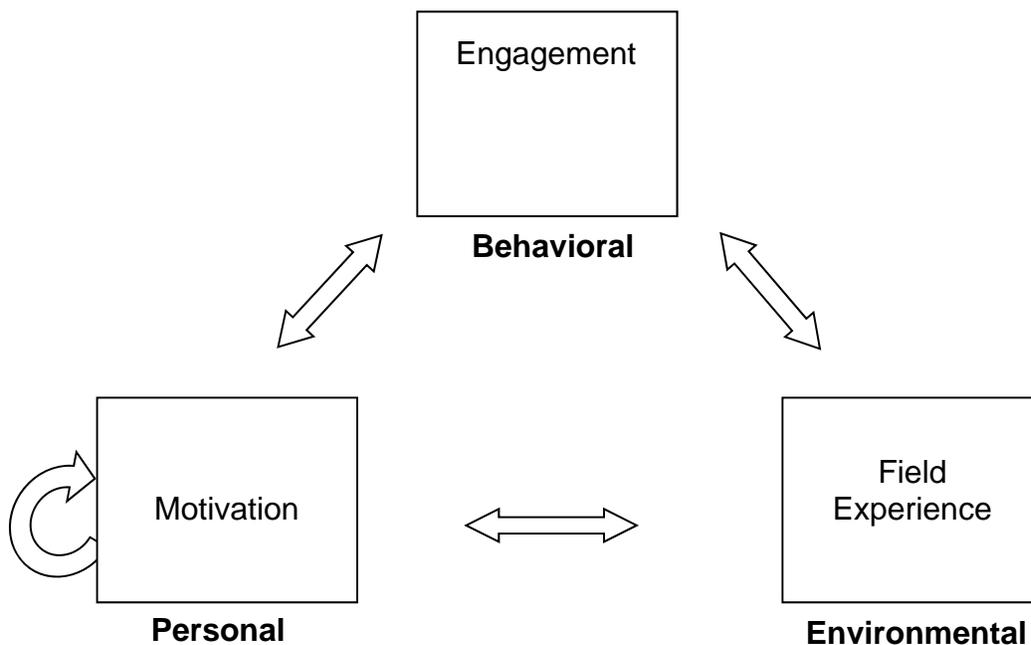
Figure 2. Conceptual Model for the Organismic Social Cognitive Theory

Methods

A phenomenological approach was used in this study. It consisted of identifying a phenomenon, bracketing out one's biases, and collecting data from 5 to 25 individuals who have experienced the phenomenon in order to elicit rich and descriptive data into a firm interpretation of what has occurred (Creswell, 2007; Moustakas, 1994; Polkinghorne, 1989).

The purposive sample of ten college students majoring in education were recruited based on their enrollment in a cross-listed course between the departments of agricultural education and curriculum and instruction. The course was an early field experience to Morocco focusing on global outreach and effective communications.

Participants attended a six-week on campus course to learn about transformational leadership through a cultural context and a three-week field experience abroad. The purpose of

the field experience was to gain an authentic cultural experience abroad while teaching 9th graders in Morocco. It was determined that the content for instruction would be effective communications, specifically English as a Second Language, in order to mitigate issues with language barriers and content knowledge among the Moroccan students and the preservice teachers.

The data for this study was collected through a pre-trip questionnaire on participants' demographics, perceived factors that influenced participants' decisions to participate, expected outcomes from the experience, and initial concerns about the experience. In addition, field notes were taken through observations, individual and group interviews. After the field experience, participants were asked to complete an adapted version of the 21 item Basic Needs Satisfaction at Work Scale (1 = Strongly Disagree, 3 = Neutral, and 5 = Strongly Agree) (La Guardia, Ryan, Couchman, & Deci, 2000). This valid instrument was designed to evaluate the satisfaction on an individual's specific psychological needs during the field experience. Both questionnaires were collected using an online survey host monitored by the researcher that did not attend the field experience.

The process of validation for the interviews followed the format set by Creswell (2007). The researchers made use of multiple and different sources, methods, and investigators to provide corroborating evidence and triangulate the responses. A detailed and thorough process of coding took place through separation of comments, highlighting key remarks, and categorizing participants' perceptions based on the following themes related to motivation: advantages, concerns, autonomy, competence, and relatedness. Finally, an audit trail was created of all video recorded interviews, developed notes, summarized field notes, and identified codes. These audits kept a consistent flow of research and discussion limiting the amount of error in the findings. A summary of the major five themes are reported in this abstract.

Results

The four males and six females were comprised of students from a variety of backgrounds; two were from the inner-city, one international student, two from rural areas, and five from suburban areas. Five participants were seniors, four juniors, and one graduate student. The two participants from the inner-city both traveled abroad for previous study tours but never for reasons other than academics. The two participants from rural areas and one from a suburban area had never traveled abroad. The remaining participants from suburban areas reported previous experience abroad for reasons other than academics.

The participants reported on the questionnaire very distinct reasons for studying abroad. The reasons ranged from intrinsic motives to more self-determined forms of extrinsic motivation. Intrinsic motives were identified as a desire to participate because of personal satisfaction with the experience while more self-determined forms of extrinsic motivation were identified as participating because of some external benefit or consequence imposed by the individual. All participants indicated that the influence to participate was a personal choice supported by their family.

In support of the aforementioned assertions, the field observations at the airport before departure yielded that all participants had self-initiated reasons for wanting to participate in the

field experience and discussed sacrifices they made to participate. Participants openly expressed a high level of excitement for the field experience. Perceived advantages for this particular field experience was that it was inexpensive, allowed for other summer activities, it wasn't during the school year so it fit into their programs of study which are tightly prescribed, the location was appealing, and it allowed participants teach in a unique context that would have a major social impact.

The major concern was that participants felt overly prepared for the cultural experience and not prepared to teach. Unanimously the participants reported only a general knowledge of what they were expected to do during the field experience. Of the ten, only two had previous experience teaching a complete lesson in a classroom, both agricultural education students. However, all participants were positive about the expected learning outcomes. Other concerns were for safety, but participants expressed confidence that steps were taken by the instructor and the institution to ensure their safety.

The field notes and interviews yielded that students were often frustrated with the teaching experience. One area of concern was that lessons were planned last minute, not providing the participants the opportunity to familiarize themselves with the lesson or practice. An observation was that multiple participants taught together and demonstrated behaviors of discomfort with the material and the process of group teaching. Suggestions to reevaluate the teaching methodology were made by the participants and the Moroccan teachers; however, the field experience instructor provided directives to maintain the methodology of teaching they were already using.

Observations yielded a change in behavior by the participants over the span of the experience. Participants who started with group-oriented behaviors begin to show behaviors of retreating into smaller groups whenever organized events were not planned. Although negative behaviors were never observed during the teaching experience, negative comments from participants about the teaching abilities or lack of engagement of other participants were recorded. In addition, overt displays of dissatisfaction with the field instructor's management style were recorded. Consequently, Moroccan student attendance consistently decreased from 78 students on the first day of classes to 41 students on Friday at the end of the first week of instruction.

During the second week of instruction, participants initiated the planning of new lessons and presented them to the field experience instructor. The new lesson plans were approved and attendance in the classes began to increase to as the new lessons were incorporated to 93 students on the last day of instruction. Participants reported how this phenomenon provided a real life example of the impact of instruction on student behavior. Similarly, participants reported that although the experience was stressful, they learned a lot about teaching, instructional planning, and classroom management.

During interviews, participants expressed a desire to have planned and practiced the lessons during the pre-field experience sessions instead of waiting until they were on-site. Participants also commented on feeling they were being told what to do instead of being allowed to make decisions based on feedback and self-reflection, contrary to how they are instructed in their teacher preparation classes and during the transformational leadership lessons. In addition,

participants expressed negative perceptions of the credibility of the field experience instructor in that instruction was contradicting observed actions. However, participants expressed enjoyment for the cultural experiences when they were able to truly engage with the residents. All of the participants stated they felt they accomplished the learning objectives and agreed that they were able to gain interesting new perspectives that will help them in the classroom. All participants expressed a desire to travel abroad more or participate in other study abroad programs. The findings of the participants' basic needs satisfaction corroborated the findings in the field notes in that participants reported a slightly moderate level of autonomy ($M = 3.19$, $SD = 0.41$) and moderate levels of competence ($M = 3.89$, $SD = 0.25$) and relatedness ($M = 3.94$, $SD = 0.49$) during the field experience.

Conclusions and Recommendations

This findings support the conceptual model in that the field experience environment has an impact on the participant's level of motivation. In turn, the level of motivation by the participant impacts his or her behavior, which impacts the environmental factors. Because these participants identified more advantages than concerns, they elected to participate, received autonomy support, and thus were more motivated to participate (Deci & Ryan, 2002). The high levels of motivation provided volition to stay engaged under stressful situations. Also, feeling connected to other participants and the incorporation of successful transformational leadership strategies during the second week of instruction provided encouragement as well due to the perceived fulfillment of relatedness and competence.

Although participation in a study abroad program does not within itself change the preservice teacher's behaviors as it relates to global engagement, it does allow one to interact with different cultures and fully immerse him or herself in a diverse environment (Hollins & Torres-Guzman, 2005). It is these global experiences, when properly structured to allow the individual to be fully engaged, reflective, and able to conceptualize and experiment within the context of the experience, that the participant's worldview is shaped, impacting one's understanding of how globalization effects government, industry, and their lives (Bruening & Frick, 2004; Hu & Kuh, 2003). However, to take advantage of the benefits of studying abroad, students must gain access to positive field experiences (Navarro, 2004; Suarez, 2003).

It is therefore recommended that more cultural field experiences are incorporated into the program of study in agricultural education that provide students with autonomy, relatedness, and competence, which are the personal motives that lead to sustained engagement. In order to accomplish this recommendation, organizers of field experiences abroad must take into account external personal factors including cost, location, family support, and academic considerations when planning a trip in order to address the barriers to participation. During the experience, environmental factors such as the instructor's supervisory style, organization of the program, opportunities to connect with the other participants, relevant cultural experiences, and the ability to accomplish expected outcomes should be monitored in order to positively impact personal motives. Finally, further studies should be conducted to further validate the conceptual framework in this context and explore the relationship between participation in substantive field experiences abroad and the likelihood of working in diverse educational settings or utilizing more culturally responsive curriculum among agricultural education majors.

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Framing Food Safety Information in an Interactive Web World: Effects of Message Framing and Web Interactivity on Attitude Change and Information Recall

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Introduction

Today, food-safety related news events receive considerable media attention. Recently, several notable incidents of agricultural products prompting food scares have made international news - pesticide residues, bacterial contamination, biotechnology and GMOs (Tucker, Whaley, & Sharp, 2006). Mass media are the public's primary source of science information (Leiss & Powell, 2004; Treise & Weigold, 2004). While media may not directly determine how people think about a particular issue, over time they may be key in influencing public knowledge and perceptions about science (Powell, Dunwoody, Griffin, & Neuwirth, 2007). Haygood, Hagins, Akers, & Keith (2002) cautioned against underestimating the influence of mass media "because perceptions and attitudes go hand-in-hand. Many of the attitudes expressed through media directly affect consumers' perceptions of agriculture" (p. 3).

Two additional factors contribute to the importance of mass media coverage of food safety related events. First, our rapidly modernizing society continues to move further from its agrarian roots towards an increasingly urbanized landscape, resulting in diminished public knowledge about agriculture (Doerfert, 2003). This lack of first-hand knowledge yields attitudes and perceptions primarily based on media accounts (Powell & Leiss, 2004). As consumers react to food safety issues, organic foods have become increasingly attractive to consumers and are perceived as safe, healthy alternatives (Hughner, McDonagh, Prothero, Schultz, & Stanton, 2007).

Another contributing factor is a drastic change in the information ecosystem brought about by the Internet, which has impacted how people relate to information. Edison Research (2010) recently determined the Internet is now the most essential mass medium for consumers. While growth in online news and information consumption spans generations, it is particularly driven by Millennials (Project for Excellence in Journalism, 2009), college-aged individuals born of an age when personal computers, televisions, and other communication technologies have been ever-present (Howe & Strauss, 2007). Although not regular news consumers, Millennials primarily use the Internet to satisfy their desire for news when seeking it and are savvy about using multiple online tools to meet their needs.

Theoretical Framework

Tuchman (1978) observed that constructing news is an inherently social process, providing a kind of window to the world through which people form perceptions. How information is structured in mass media, how it is framed, affects the way information is processed in one's mind (Reese, 2003). Frames include and/or exclude certain information, indicating to audiences how a message should be interpreted (Bateson, 1972; Hallahan 1999). Framing has the ability to eliminate certain voices and affect the strength or weakness of

arguments, triggering different cognitive functions in the mind and affecting individuals' risk perceptions. (Tankard, 2003; Iyengar, 1991).

A unique characteristic of the Internet is interactivity, which has been called the primary advantage of new media (Morris & Ogan, 1996). Kiousis (2002) noted the standard for interactivity is ambiguous but defined it as "the degree to which a communication technology can create a mediated environment in which participants can communicate…both synchronously and asynchronously and participate in reciprocal messages exchanges" (p. 356). Tremayne (2008) determined information presented in an interactive online environment can improve learning among readers. Past research has indicated that website interactivity can have an impact on persuasion (Sicilia, Ruiz, & Munuera, 2005; Sundar & Kim, 2010; Sundar, Kalyanaraman, & Brown, 2003).

"Attitudes can serve important functions for people…and can be useful in predicting behaviors" (Petty and Cacioppo, 1996, p. 29). Several theoretical approaches are used to explore attitude change, but that the elaboration likelihood model (ELM) is often used when attempting to understand attitude change. Petty and Cacioppo (1981) also stated that personal relevance of the issue under consideration is the primary determining factor as to whether one is persuaded by a message, whether one's attitude is changed.

Several studies have been conducted comparing the effectiveness of online versus print messages on subjects' recall of information, and results have varied. Tewksbury & Althaus (2000) determined those who read online news were less likely to recall national and political news than business and other news topics and found cues present in online news were more likely to distract subjects than encourage them to recall information. Eveland & Dunwoody (2002) used experimental methodology to explore influence of medium on subjects' information processing and determined subjects exposed to online messages had increased elaboration when compared to those receiving print messages. Increased elaboration was positively related to the amount of learning exhibited. However, subjects receiving online messages learned significantly less when compared to those receiving printed messages. Davis et al. (2005) measured recall of a news story presented in print and electronic text and found print delivery yielded greater recall, with subjects exposed to print news stories recalling significantly more information than those who received electronic text.

The conceptual model (Figure 1) takes its shape from elements of the ELM and suggests risk/benefit message framing and website interactivity interact to impact a subject's ability to recall information from a news story and effect an attitude change regarding the issue in that story.
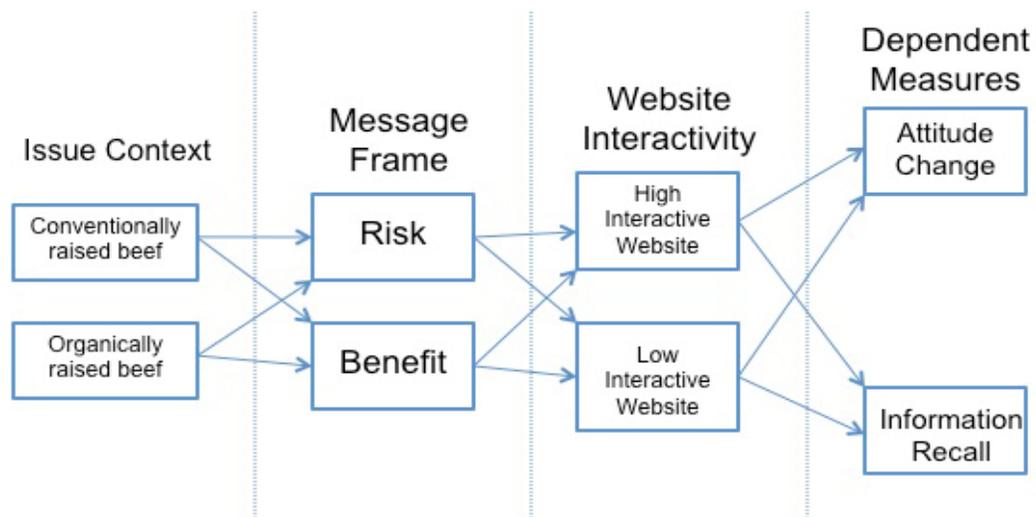
Figure 1.

Purpose and Hypotheses

The purpose of this study was to combine message frame with website interactivity level and determine effects on subjects' attitude change and information recall. The following hypotheses were tested:

H_1: Subjects receiving risk-framed messages on a high interactive site will have significantly less information recall than subjects receiving the benefit-framed message.

H_2: Subjects receiving the risk-framed messages on a high interactive site will have significantly greater attitude change than subjects receiving benefit messages on a low interactive site

Methods

This study used an experimental design, with a 2 (risk of conventional/organic, or benefit of conventional/organic message) x 2 (low interactive website/high interactive website) between subjects, factorial design, which allowed for investigation of combined effects of two or more independent variables (Ary, Jacobs, Razavieh & Sorenson, 2006). The study employed a convenience sample of college students from four courses at a southern university and was therefore quasi-experimental (N = 492). Subjects were randomly assigned to one of eight treatment conditions and were offered course extra credit as an incentive for participation. Data were collected for individual subjects and steps were taken to ensure subjects completed the experiment only once.

Four news stories were prepared utilizing risk/benefit frames about ground beef, based on a review of relevant literature. Frames were developed using Marette, Roosen, Blanchmanche, and Verger's (2006) methods. All stories included general information about beef; both benefit versions contained information about the benefits of CLAs, both risk versions contained information about the risks of *E. coli*.

Website interactivity was operationalized using Chung and Yoo's (2008) definition. To reduce the risk of potential threats to ecological validity per Christensen (2001), subjects were shown images of experimental conditions rather than live websites. Low-interactive site images included the framed message on a single page, no hyperlinks and no photo. High-interactive site images included in-text hyperlinks, social networking "share" buttons, photo related to the story, and a podcast link with a video image.

Potential confounding variables such as individuals' need for cognition and prior knowledge of the subject were controlled for through design, treated as individual difference variables and analyzed separately.

A panel of experts addressed validity of the researcher-designed instrument. Pilot testing addressed construct validity and tested the pre-experimental measures, the instrument, and the experimental message stimuli. Reips's (2010) recommendations for online research and Dillman's (2009) tailored design method were used. Precautions were taken to ensure no subjects in the pilot study were part of the final sample. To evaluate message frame and website interactivity treatments, manipulation checks were conducted.

A six-item scale used by Wood (2006) and Meyers (2008) with an alpha reliability of .95 was employed to measure attitude. Attitude change was measured by utilizing the attitude scale on two separate occasions and calculating the difference in scores (Kelman, 1953; Woloschuk, Harasym, & Temple, 2004), with the lowest possible score on each scale a 6, and the highest 30.

Administered through Qualtrics, the instrument contained four pre-treatment sections containing a total of 45 items, the experimental treatment, two post-treatment measures (attitude and information recall), and 30 demographic items. The instrument was delivered to 492 subjects; 410 completed the entire instrument.

Results

Results reported here are part of a larger study conducted by the researchers. Descriptive analysis revealed subjects ranged in age from 18 to 48, with a mean of 20 years. The majority of subjects indicated enrollment in the college of agriculture (72%, n = 296) and all other undergraduate colleges at the university were represented in the sample. Subjects were primarily college juniors (40.7%, n = 167).

Mean attitude score following exposure to treatment was 17.06, indicating a slightly negative attitude toward beef. A Cronbach's alpha test of reliability was computed on the post-experimental measure attitude scale. The overall alpha reliability was $\alpha = .94$, and the total scale measuring attitude after exposure to the experimental treatments had standard deviations ranging from .94 to 1.11, with the scale not significantly improved by removing items. Scores on attitude change ranged from 7 to 12, with a grand mean of 3.84 (using absolute values).

To measure information recall, Davis's (2003) method was employed and four multiple-choice items were created based on information included in the message treatments. Items included were taken from the USDA's National Organic Program Standards (2008), academic research published about CLAs (2007), and information available from the Center for Disease Control and Prevention (CDC) about *E. coli* O157:H7. Correct answers were scored as 1,

incorrect answers 0, and scores were summed create an index of information recall. Scores ranged between 0 and 4, with an average score of 4 across treatment conditions. The information recall measure contained four items combined to create an index, which yielded an alpha reliability coefficient of .89.

An independent sample *t-test* of the first hypothesis revealed that no significant differences existed between subjects exposed to risk-framed messages on a high interactive site (*M* = 3.55, *SD* = .718) and those receiving benefit-framed messages on a low interactive site (*M* = 3.52, SD = .78; F (1, 203) = .06, p = .80. Effect size was calculated using partial eta squared, resulting in .00, indicating no effect.

An independent sample *t-test* of the second hypothesis revealed that significant differences in attitude change scores did exist between subjects receiving risk-framed messages on a high interactive site (M = 4.55, SD = 2.86) and subjects receiving benefit-framed messages on a low interactive site M = 3.18, SD = 3.56; F (1, 201) = 8.97, p = .00. Effect size was calculated using partial eta squared and was .04, accounting for 4% of the variance.

Discussion/Conclusions

In this study, subjects did not differ in their information recall as a result of the experimental treatment received, which may be because the measure included only four items (out of a total of 60+) and was not enough to accurately measure recall. In experimental research, effects of treatments can be underestimated because tests do not accurately measure subjects' achievement (Ary, et al., 2006).

The second hypothesis did reveal a difference between subject groups; a greater attitude change was found in subjects in the risk/high treatment group. Recognizing a potential contributing limitation of the study in using a static image to represent an interactive website means it is possible the difference was due to an element of fear inspired by the risk framed message, rather than the combination of interactivity and message frame.

Recommendations

The researchers recommend future studies with a lengthened information recall measure, in combination with the use of a live website to explore information recall. The study could employ website tracking software to determine whether or not subjects moved beyond the treatment pages and material. Additionally, literature on attitude illustrates the importance of experience and prior knowledge, and it may be instructive, especially when including an element of fear or risk in message treatment, to ask subjects directly about these items. From the results of this study, it appears persuasive communicators can employ interactive functions as they wish without fearing negative consequences. However, it is important again to realize that definitions and perceptions of interactivity vary widely.

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Undergraduate Involvement in Extracurricular Activities and Leadership Development

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Introduction

Reforms in higher education have led to a greater focus on student learning outcomes, including professional skill development like leadership, and the impact of experiences outside the classroom as learning opportunities (Astin, Keup, & Lindholm, 2002). The Council for the Advancement of Standards in Higher Education (CAS) identified leadership development as one of 16 student learning and development outcomes and suggested that leadership can be intentionally learned (CAS, 2006). "There is a growing recognition that this task [purposefully develop socially responsible leaders] is the responsibility of all members of the campus community, not just those teaching leadership courses or those working with co-curricular leadership programs" (Dugan & Komives, 2007, p. 5). The American Association of Agricultural Education identifies the need for leadership research in the National Research Agenda and suggests local leadership capacity and the level of civic engagement as significant factors in improving the quality of life in rural communities.

Conceptual framework and literature review

An adaptation of Terenzini and Reason's (2005) model explaining college students' first-year experiences served as the framework for this study. The framework for this study had three components, precollegiate characteristics and experiences, collegiate experiences, and leadership outcomes (Figure 1).

The precollegiate construct of this model included socio-demographics that have been linked to leadership development, including race (Phinney, 1990) and gender (Kezar, 2002). Additional personal and social experiences related to undergraduate leadership development, such as precollegiate extracurricular experiences (Park & Dyer, 2005) and leadership self-efficacy (Dugan & Komives, 2007) were also included.

The college experience construct included three types of individual student experiences that have been associated with leadership development: 1) classroom experiences; 2) curricular experiences; and 3) out-of-class-experiences. The focus of this research was out-of-class experiences, specifically extra-curricular activities. Astin (1999) proposed that positive outcomes of involvement are a result of both the quantitative (i.e., how much time a student spends on an activity) and qualitative (i.e., how focused the student is on the activity) aspects. The frequency and quality of students' participation in activities was associated with high educational aspirations, enhanced self-confidence, and increased interpersonal and leadership skills (Pascarella & Terrenzini, 1991).

Reflection

Pre-Collegiate characteristics and experiences

- Socio-demographic traits
- Academic preparation and performance
- Personal and social
- Belief in leadership

M e n t o r i n g

College

Individual Student Experiences

Classroom experiences

Out-of-class experiences

Curricular experiences

Service learning

C u l t u r e

Leadership Development* Outcomes

- Individual values
- Group values
- Community values

*Using social change model (HERI, 1996).

Figure 1. Collegiate leadership development model. Foreman & Retallick, in-press.

The Social Change Model (SCM), developed by the Higher Education Research Institute of UCLA in 1993 is a widely cited model of leadership in higher education (Haber & Komives, 2009) and was used to conceptualize leadership development. The SCM describes leadership as a purposeful, collaborative, values-driven process. Its central principles—social responsibility and change for the common good—are assessed through eight core values that describe students' level of self-awareness and ability to work with others. The model views leadership as a process, not a position, and encourages leadership development in all participants, including those who hold formal leadership positions and those who don't. The SCM promotes the values of equality, social justice, self-knowledge, personal empowerment, collaboration, citizenship, and service (Astin & Astin, 2000).

Community Values of the Social Change Model was the dependent variable for this study. Community Values is described as, "Believing in the process whereby an individual and/or a group become responsibly connected to the community and to society through some activity. Recognizing that members of communities are not independent, but interdependent. Recognizing individuals and groups have responsibility for the welfare of others." (Dugan & Komives, 2007, p. 10).

Purpose and Research Questions

Literature links undergraduate extracurricular participation and leadership outcomes (Birkenholz & Schumacher, 1994; Ewing et al., 2009; Layfield et al., 2000). However, a better understanding of the extracurricular experiences and which of those experiences result in desired leadership outcomes is needed. This study examined extracurricular experiences that contribute to students' community values of Socially Responsible Leadership.

Four research questions guided this study:

1. Does membership in extracurricular clubs and organizations influence leadership development?

2. Does the amount of time a student spends participating in a club or organization influence leadership development?

3. Does the level of participation in extracurricular clubs and organizations influence leadership development?

4. Does gender or race influence community values of leadership development?

Methods

This study was a part of a larger study designed to examine the role of undergraduate extracurricular participation in leadership development. Full-time, undergraduate college students classified as seniors in the College of Agriculture and Life Sciences at Iowa State University ($N = 969$) were surveyed.

The researchers designed an on-line questionnaire to answer the research questions. The instrument reflected the conceptual framework and contained three sections: precollegiate characteristics and experiences, collegiate experiences, and SRLS-R2 citizenship scale.

Precollegiate and collegiate characteristics and experiences were assessed using both university records (i.e., demographics) and the web-based survey (i.e., collegiate extra-curricular activities). Information about extracurricular experiences was gathered via the web-based instrument. Skip/display logic was used to customize the questions each subject received. Subjects were asked to indicate whether or not they participated in extracurricular organizations and based on the responses to these questions, subjects were asked additional questions to learn more about their experiences.

Community Values of the Social Change Model was the dependent variable for this study and was measured using the citizenship scale of the Socially Responsible Leadership Scale (SRLS-R2) (National Clearinghouse for Leadership Programs, 2009). Reliability for the SRLS-R2 community values scale was computed for this study using Cronbach's alpha and was .896. A panel of professionals comprised of faculty and graduate students with expertise in undergraduate outcomes, extra-curricular experiences, and leadership development reviewed the instrument for validity. In addition, the instrument was field tested with students similar to those in the sample to establish validity of the instrument. Based on their feedback, changes to content, question format and data collection procedures were made to improve the validity of the instrument.

The researchers modified Dillman's (2007) five-step data collection approach on the basis of suggestions from students on the expert panels. The distribution list obtained from the university registrar's office contained 969 subjects. Subjects were contacted via e-mail to participate in the study and were sent up to four e-mail reminders inviting them to participate in

the study if they had not yet completed the questionnaire. This process resulted in 270 responses (27%), 199 of which were complete for a usable response rate of 20.5%.

Non-response error was controlled by comparing early and late respondents, as suggested by Lindner, Murphy, and Briers (2001). According to this analysis, differences in involvement in extracurricular activities did not exist between early and late respondents.

Results

Ninety-one (45.7%) males and 108 (54.3%) females responded to this study. All were full-time students and were classified as seniors; 151 subjects (75.9%) entered the university directly from high school, and 48 subjects (24.1%) entered as transfer students. Ninety-six percent of respondents indicated they were involved in an extracurricular activity, including 21% in the Greek system, 95% in extracurricular clubs and organizations, and 29% in competitive teams. The results of a t-test indicate that students who were members of clubs ($M = 33.22$, $SD = 3.71$) scored higher on the citizenship scale than those that were not ($M = 31.73$, $SD = 4.29$, t (75.83) = -2.15, $p = .035$).

Membership

The number of extracurricular clubs and organizations that students reported being involved in ranged from 0 to 11 ($M = 3.41$, $SD = 2.44$) extracurricular clubs and organizations. Females ($M = 3.91$, $SD = 2.29$) were involved in more clubs than males ($M = 2.82$, $SD = 2.48$, t (197) = -3.198, $p = .002$). The number of clubs and organizations a student participated in was calculated based on the clubs and organizations in which a student indicated they participated. This variable was recoded into four categories (i.e., 0 clubs, 1-2 clubs, 3-4 clubs, and 5-11 clubs) An ANOVA using the number of extracurricular clubs and organizations as the independent variable and leadership development (SRLS-R2 – citizenship) as the dependent variable indicated a significant relationship between the number of clubs a student participates in and leadership development ($F(3, 179) = 10.55$, p .000).

Amount of time spent

The average amount of time students spent in extracurricular clubs and organizations ranged from 0 to 20 or more hours per week ($M = 5.33$). Gender differences were not found ($p \leq .575$). Average hours per week spent in extracurricular clubs and organizations was a categorical variable with 20 possible answers. This variable was recoded into four categories (i.e., 0-1 hours, 2-3 hours, 4-6 hours, and 7 or more hours). An ANOVA was computed using the recoded average hours per week as the independent variable indicated a significant relationship between the amount of hours per week a student is involved in extracurricular activities and community values (F, (3, 179) = 6.53, $p = .000$).

Level of participation

One hundred forty-two students (71.4%) reported serving as an officer; 57 (28.6%) did not. Pearson Chi Square indicated no gender differences between students who served as an officer and those who did not (χ^2(1, $N = 199$) = 1.076, $p = .30$). Students who served as officers ($M = 7.02$, $SD = 4.69$) spent more hours per week involved in extracurricular clubs and

organizations than those who didn't serve as officers ($M = 3.55$, $SD = 4.39$), $t(196.96) = 5.40$, $p = .000$. The results of a t-test show that students who served as an officer ($M = 33.80$, $SD = 3.42$) in a club or organization scored higher on the SRLS-R2 scale ($M = 31.80$, $SD = 4.16$), $t(170.58) = -3.54$, $p = .001$.

Gender and race

The results of a t-test indicate that females ($M = 104$, $SD = 3.77$) scored higher on the citizenship scale than males ($M = 79$, $SD = 3.91$), $t(164.89) = -1.79$, $p = .002$. Less than 6% of the respondents were a race other than white, therefore no comparisons were made.

Conclusions and implications

A limitation of this study was that data were collected at one College of Agriculture and Life Science at a fairly homogeneous institution. In spite of this limitation, the analysis offers insights for other institutions who aspire to increase student leadership outcomes. Leadership development is an important outcome of the college student experience. Results of this study are consistent with previous research (Birkenholz & Schumacher, 1994; Ewing et al., 2009; Layfield et al., 2000) on the importance of participating in extracurricular clubs and organizations. Involvement in these activities (i.e., membership, the number of clubs in which a student is involved, amount of time spent, and serving as an officer) has a strong relationship with leadership development, and institutions should include the role of extracurricular activities as they develop action plans for reaching leadership development outcomes. Additional research is recommended to identify specific characteristics or activities of extracurricular involvement that are most likely to increase leadership outcomes. This information would be very valuable as educators work with student leaders to create meaningful experiences.

A significant gap exists between leadership theory and practice (Dugan & Komives, 2007).   To reduce this gap, institutions of higher education and perhaps the individual colleges within those institutions should adopt a conceptual framework for developing and assessing leadership outcomes that includes curricular, classroom, and extracurricular components. Astin's (1999) involvement theory supports the need for increased engagement both inside and outside the classroom. Astin (1984) describes an involved student as one who "devotes considerable energy to studying, spends much time on campus, participates actively in student organizations, and interacts frequently with faculty members and other students" (p. 518).

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Self-Perceptions of Leadership Held by Upper Classmen in Two FFA Chapters – A Collective Case Study

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Introduction

It is evidenced that leadership development is a primary aim of the National FFA Organization, taking center stage in its motto and the listing of strategies for accomplishing the motto (National FFA Organization, 2006b). To measure the effectiveness of leadership training and development within members, studies have been conducted showing that FFA membership increases student leadership skills (Dormody & Seevers, 1994; Mullins & Weeks, 2006; Ricketts & Newcomb, 1984; Stewart, Smith, Ehlert & Mihalevich, 1985; Wingenbach & Kahler, 1997). Additionally, level of involvement within the FFA has been shown to have a direct relationship with higher student self-perceptions of leadership than membership alone (Brick, 1998; Carter & Spotanski, 1989; Mullins & Weeks, 2006; Ricketts & Newcomb, 1984; Townsend & Carter, 1983).

Though these studies address adolescent leadership in the FFA through a quantitative lens, few studies directly address leadership from the adolescent perspective (Whitehead, 2009). Van Linden and Fertman (1998) support the need for understanding leadership through the eyes of adolescents and assert that improvement in leadership development can occur through this deeper understanding. If agricultural educators are to assist all members in reaching their full potential, they must have a better understanding of how students think about and perceive leadership. Thus, an in-depth qualitative inquiry addressing student perceptions of leadership, decisions to engage in leadership opportunities, and the impact of leadership on students from their own eyes and descriptions is valuable.

Conceptual Framework

The conceptual model proposed by Ricketts, Osborne, and Rudd (2004) guided the study (Figure 1). This conceptual model illustrates factors that may explain the emergence of leaders in local FFA chapters. This study sought to identify self-perceptions of leadership and the influences that are impacting student's decisions to engage in leadership. Specifically, this study focused on the sub-factors listed within the primary group of "Self", though other factors may emerge as influencers on such decisions. A theoretical foundation for the purported model is McClelland's (1961) motivational theory. The theory identifies achievement, power and affiliation as the motivational needs that influence individual behaviors. A student's motivational needs are assumed to play a large role in a student's decision to engage, or not engage, in leadership opportunities and training made available through the FFA.

Family
Encouragement
Support
Role models
Socio-economic status
Views toward
 Ag/FFA/Leadership
Distance from school
Location of residence
Involvement in school
Family structure

FFA
Knowledge
Attitude
FFA membership
Years in HS FFA
Participation/
 success in CDEs
Leadership
 experiences
Participation

School
Reputation of FFA
Peer influences
Enrollment
Climate
Quality of student
 organizations
Administrative
 support

Self
Gender and Ethnicity
Need for power
Need for recognition
Need for affiliation
Need for achievement
Leadership knowledge
Goal orientation
Leadership ability
Leadership experiences
Success/failure
Career plans
Maturity
High School GPA
Communication skills
Self-concept
Leadership perceptions
Athletic participation
Academic participation
School & community
 participation
Leadership roles
Learning style
Personality type
Critical thinking

Local FFA Leadership Level

Ag Program/FFA Chapter
Agriscience program quality
FFA chapter quality
Leadership opportunities
FFA recognition program
Agriscience program type
Teacher support and
 encouragement
% Female students
% Female members
% in 11-12 grade Ag
Leadership curriculum

Community
Population
School support
Ag program
 support
FFA support

Agriscience Teacher
Gender
Quality
Background
 experiences
Number of teachers

Figure 1. Conceptual Model of Factors Affecting the Emergence of Leaders in Local FFA Chapters (Ricketts et al., 2004).

Purpose, Central Question and Research Sub-Questions

The purpose of this collective case study was to describe the self-perceptions of leadership possessed by upper-classmen FFA members in two FFA chapters. The central question guiding the study was: What are the self-perceptions of leadership engagement possessed by upper classmen FFA members in two FFA chapters in Missouri? The research questions designated for reaching the central question were:

1. What does the term "leadership" mean to upper classmen FFA members?
2. What influences a student's decision to engage or not engage in leadership within their FFA chapter?
3. What do students engaged in leadership in their FFA chapter say they aspire to attain from the experience?

Methodology

This qualitative inquiry utilized a collective case study methodology (Stake, 1995) to investigate self-perceptions of leadership possessed by upper classmen FFA members in two FFA chapters. The researcher recognized the philosophical assumptions presented in Creswell (2007) in the research design. Purposeful sampling of cases that were typical representations of high quality chapters was utilized (Creswell, 2007; Stake, 1995). Two bounded cases were identified for this collective case study: Centerville and Tama. Both cases had two agricultural education teachers, with a male teacher having the most influence on the leadership aspects of the chapter. Each chapter had also received the National Chapter Award along with memberships of approximately 175 members.

A total of 23 students were involved in the study. The researchers collected a reflective questionnaire from each student, from which students were divided into four groups within each case: leading males, non-leading males, leading females and non-leading females. A "leader" was defined as a student who had served or was currently serving as an officer within their FFA chapter. Status as a chapter officer was chosen to distinguish between leaders and non-leaders within the chapter to establish a clear distinction. Following the designation of groups, the researchers conducted four semi-structured focus group interviews within each chapter, eight interviews in total. Additionally, the researchers conducted field observations within each case. Data analysis was driven by participant's responses (Ary, Jacobs, Razavieh, & Sorensen, 2006). The researcher recorded, transcribed and individually coded focus group interviews using line by line coding, then combined codes into emergent themes (Stake, 1995). Reflective questionnaires and observations were then line by line coded utilizing those themes. Credibility of findings was built through bracketing of the researcher's prior experiences and data triangulation (Ary et al., 2006). Dependability and confirmability were facilitated through data triangulation and an audit trail maintained throughout the research process (Ary et al., 2006). Although findings of this study cannot be generalized beyond the cases themselves, transferability was facilitated through the use of representative direct quotations from the participants themselves and the use of thick, rich descriptions (Ary et al., 2006).

Findings

This abstract represents a portion of a larger study. Findings of that larger study consisted of six emergent themes, this portion emphasizing five of those themes. Student definitions of leadership were first established, prior to theme emergence. Most prominently, students expressed belief that leadership is about helping people, influencing others, and making a difference in other's lives. The second major premise of leadership identified by students was that leadership is taking control of a situation, taking charge, and holding power.

The first emergent theme of the study was Personal Abilities and Motivation Influence Leaders. It surfaced that leaders pursue leadership because it is something they enjoy and are supposed to do. One student stated, "I feel good after I do something leadership wise, I just like the idea of it." Helping others, influencing and inspiring them to act on their goals, and serving as a positive example were reasons that many chapter officers chose to pursue and excel in their leadership positions. Power, control, and recognition were identified by students as enjoyable aspects that accompany leadership. One male leader explained, "I like that you always get

noticed when you walk in a room. You get a lot of attention just for being in that leadership position…" A final component of this theme was motivational differences that surfaced between leaders and non-leaders. Primarily, it was found that achievement was much more common as a motivational factor of leaders than non-leaders.

Support from Others Influences Leadership was the second emergent theme. Leaders and non-leaders alike identified that support from family and their FFA advisor had an influence on an individual's propensity to lead. One male student leader stated, "I looked up to my brothers and I seen what leadership was from them… I just started acting like them and they were leaders, and I became a leader." Similarly, students acknowledged that family members could influence them to not pursue leadership. In addition to family, students discussed that encouragement, or lack thereof, from the FFA advisor had a significant influence on student leadership decisions. If the advisor had at some point specifically spoken to a student about pursuing a leadership position within the chapter, the student was more likely to take interest in such a position.

The third emergent theme was Significant Barriers to Leadership are Perceived by Leaders and Non-Leaders. Among barriers discussed, the two most common were communication and time commitment of leadership. The level of comfort with communication, particularly with public speaking, was considered a large barrier to leadership. One student explained, "Some people aren't people-people. They don't like bein' around people, talkin' to people, they aren't good public speakers. And that, that really hurts ya in FFA." The most commonly discussed barrier to leadership was time commitment necessary for leading. Leaders and non-leaders alike recognized that leading within FFA is a large time commitment, and a reason that many students do not pursue leadership opportunities.

The fourth theme identified was Leadership Enhances Personal and Professional Development. One student explained, "There is nothing bad about being a leader at all. There is nothing bad that can come from it. It's all good." Enhancement of personal development included perceived intrinsic benefits, skill development, and friendships that were gained through leadership positions. Students perceived that leadership enhanced professional development through a greater number of opportunities made available to leaders and preparation for the future that leadership afforded.

The fifth theme was that Leaders Perceive that Non-Leaders are Apathetic. Specifically, student leaders discussed their belief that if not held back by another barrier, non-leaders chose not to lead due to lack of care or laziness. This sentiment was described multiple times with one student leader voicing:

> *"I think some people are lazy. Okay, because being an officer, I have to come in at 7, and like being on a leadership contest team, I have to, like, wake up at 5:30 to go to do practice contests. And I was talking to a friend the other day and telling them what time I had to go to FFA contests and they were like, 'That is why I quit the team. I did not want to get up that early on my Saturday morning.' And that's just, kind of being a bum, I think."*

Conclusions, Recommendations and Implications

Conclusions, implications and recommendations from this study cannot be inferred past the cases themselves. First, it can be concluded that leaders not only acknowledge the power, control and recognition that accompany leadership, but that some desire it. This is consistent with research on the connection between leadership and motivations (Kirkpatrick & Locke, 1995; Ricketts & Rudd, 2002). It may be implied that some students may pursue leadership opportunities specifically for these reasons. Researchers recommend that FFA advisors be cognizant that this may be motivating chapter officers and influencing chapter leadership.

A key conclusion that may be drawn from this study is that FFA advisors play a crucial role in students' decisions to pursue leadership opportunities. This conclusion supports the conceptual model of Ricketts, Osborne and Rudd (2004). This assertion implies that if a student does not perceive their advisor has confidence in their potential to be a leader, and they are not receiving that encouragement elsewhere, they are much less likely to believe in their own ability to be a leader. It may also be implied the advisor plays a much larger role in determining a student's pursuit of leadership than they realize. The researchers recommend that advisors work to support each student in their personal leadership development.

It may be concluded that students view public speaking and communication as a crucial element of leading within the FFA, which supports the conceptual model of this study (Ricketts, Osborne & Rudd, 2004). From this conclusion it may be implied that some students are not pursuing leadership opportunities due to fears of communicating with others. It is recommended that students be led to understand that public speaking is important, though not an end-all trait of leadership. It may also be concluded that some students choose not to pursue leadership due to the time commitment of the position. It is recommended that advisors and FFA chapters work to establish ways for this barrier to be overcome.

Finally, it can be concluded that all students recognized an overall benefit to leadership, whether they were leaders or not. This implies that even those non-leading students acknowledged that leadership results in personal and professional benefits. This supports the research cited earlier in the study.

It is recommended that this research be replicated in other chapters and in other states. It is further recommended that an investigation into the influence of gender on student self-perceptions of leadership be conducted. Finally, from the student's perspective, additional research on the influence of McClelland's motivation theory on student decisions to engage in leadership should be investigated.

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Can We Do More With Less? Examining Factors Influencing Student Ratings of Instruction

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Introduction

Undergraduate enrollments at universities and colleges across the United States are booming. More than 70 percent of the members of the high school graduating class of 2009 enrolled in college, which is the highest portion of individuals on record, dating back to 1959 (U.S. Department of Education, 2009). While enrollment trends decreased slightly in 2010, 68% of students graduating high school still entered higher education. Faculty teaching loads have increased accordingly. Specifically at the University of Missouri, the student to faculty ratio from 2007-2011 increased from 17.2:1 to 21.6:1 (MU System, 2011). Higher enrollments at universities and colleges coupled with fewer faculty poses unique challenges to maintaining quality and student satisfaction under the constraints of shrinking resources.

While not without their own problems in the literature, student ratings of instruction are an important instructional outcome. Student ratings have been collected for end of semester course evaluations and overall instructor evaluations as early as 1900 in college classes (Guthrie, 1954). Thus, student ratings are one of the earliest and most consistently documented forms of instructional outcomes for college teaching. A large body of research has been conducted in higher education regarding the validity of end of semester student ratings of instruction, and it has been widely accepted that as one form of information, student ratings can be considered valid (Cohen, 1981; Kulik, 2001). End of semester evaluations of teaching effectiveness and overall course effectiveness provide valid insights into learning, student satisfaction, and ways in which instructors can improve a course.

This study was conceptualized around the psychological literature regarding environmental stress and how stressors of course and classroom crowding can impact students' perceptions of instructional effectiveness (Gifford, 2007). Environmental stress can be caused by factors such as noise, crowding, and temperature (Evans, 1982). For this study, it was conceptualized that the number of students enrolled in a class, the physical crowding of a classroom in terms of actual number of seats available, and the enrollment capacity of a course could have an impact on student perceptions of instructional quality in a course, as translated by the ratings they give on end of semester evaluations.

In an early meta-analysis by Glass and Smith (1979) regarding class size and student achievement, the researchers concluded, "there is little doubt that, other things equal, more is learned in smaller classes" (p. 15). Large, lecture style classes have been noted to be less conducive to critical thinking and advanced problem solving (Whittington, Stup, Bish, & Allen, 1997), whereas higher-order thinking is more easily achieved in smaller class settings (Persky & Pollack, 2010). Furthermore, it has been widely concluded in the literature on student ratings of instruction that class size has a negative impact on course evaluations (Monks & Schmidt, 2010). Yet, specific repercussions, as they translate to student ratings of instruction, of teaching more students with decreased classroom space and decreased instructor capacity is unknown. In short,

when a college class is over-crowded both physically, as indicated by classroom capacity, and psychologically, as indicated by course enrollment capacity, what is the outcome on student ratings of teaching? What are specific repercussions, as noted in student end of semester ratings of instruction, of trying to include more students into a course than the room or the instructor can capacitate?

Purpose/Objectives

The purpose of this study was to examine the relationships between class size, classroom capacity and enrollment capacity for specific agricultural economics and agricultural education courses on end of semester ratings of instruction. The study addresses Priority 4 of the 2011-2015 National Research Agenda for the American Association for Agricultural Education regarding meaningful and engaged learning in all environments (Doerfert, 2011). The following research objectives guided the stated purpose of the study:

1. Describe the characteristics of selected agricultural education and agricultural economics courses in regard to class size, room capacity, and enrollment capacity
2. Explain the variance in student ratings of teacher effectiveness that can be explained by room capacity and enrollment capacity when controlling for class size.
3. Explain the variance in student ratings of course as a whole that can be explained by room capacity and enrollment capacity when controlling for class size.

Methodology

This study utilized a descriptive-correlational research design. The population for the study was all undergraduate courses in agricultural education and agricultural economics at the University of Missouri taught between 2000 and 2010, with adjustments made for duplications in the data frame, courses that were problems or seminar in nature, and courses with missing course evaluation data (n=393).

As a time and place sample this sample should not be considered representative, and some caution should be noted when interpreting the results. The data collection instrument was the course evaluation data from end of semester course evaluations as well as university and departmental enrollment records. Dependent variables for ratings of instruction were two major end-of-semester evaluation items including "course as a whole" and "teaching effectiveness." These items were reported as mean scores on a 5-point scale. End of course evaluations have been utilized by the university reporting measures and are publicly available to students per state law mandate, Missouri Senate Bill 389. The independent variables, collected from the university enrollment system, were the enrollment capacity of the course (how many students at which the department caps the course), and the room capacity (how many students the university says the room will accommodate). Hierarchical multiple linear regression was utilized to describe the variance in student ratings of instruction contributed by enrollment capacity and room capacity when controlling for class size. An alpha level of .05 was set *a priori*.

Results/Findings

As illustrated in Table 1, there were a total of 17,541 students enrolled across 393 undergraduate courses offered from 2000-2010 in agricultural education and agricultural

economics representing 55 unique instructors. According to the descriptive statistics of class size, enrollment capacity, and room capacity it was determined that the number of students in a class ranged from 6 to 441 with a mean of 61.3 students (SD= 71). Enrollment capacity ranged from 14.5% full to 168% over capacity for the number of students that should be allowed in a class. The mean was 74.5% (SD= 25.6%), or at three-fourths full enrollment capacity. Room capacity ranged from 20.8% full to 200% over capacity of how many students were in a classroom, based on what the room should physically accommodate. The mean was 79.9% (SD= 28.5%) or at just over three-fourths of the full room capacity. The average instructional rating for the course as a whole for all 393 courses was a 3.9 on a 5.0 scale (SD=.57) and the average instructional rating for instructor teaching effectiveness was a 3.8 on a 5.0 scale (SD=.58).

Table 1

Summary of Descriptive Statistics (n=393)

	M	SD	Range
Class size	61.3	71	6 - 441
Enrollment Capacity (%)	74.5	25.6	14.5 - 168
Room Capacity (%)	79.9	28.5	20.8 - 200
Teacher Effectiveness	3.8	0.58	2.2 - 5.0
Course as a Whole	3.9	0.57	2.1 - 5.0

Research objectives two and three attempted to explain the variance in student end of semester ratings of teacher effectiveness and course as a whole attributed to room capacity and course capacity when controlling for class size. Initially, a Pearson's product correlation was run to determine if there was an association between the dependent variables. It was determined that there was a high correlation ($r = .819$) between dependent variables. Even with the high correlation, it was necessary to complete two separate hierarchical multiple linear regression models to examine the two dependent variables and examine possible differences between them. The research on student ratings of instruction indicates that it is difficult to differentiate between 'instructor as a whole' and 'course as a whole' mean ratings and thus, separate models, while overlapping, would be more comprehensive in explaining the entire scope of variance in student end course evaluations (Cohen, 1982). Additionally, during assumption testing, enrollment was expressed as curvilinear on the Q-Q plot and therefore, enrollment was transformed using log10. The Q-Q plot of the transformed variable indicated linearity. All other assumptions were tested and met.

Specifically, research objective two sought to explain the variance in student ratings of teacher effectiveness attributed to room capacity and course capacity when controlling for class size. The hierarchical regression model (see Table 2) for enrollment capacity, room capacity and class size predicted approximately 7.4% of the total variance ($R = .273$, $R^2 = .074$) in the student ratings of teaching effectiveness. The model was found to be significant ($F_{(3, 392)} = 10.979$; p

≤.05). When controlling for class size, enrollment capacity and room capacity explained approximately 7.8% of the unique variance and were significant (p=.000).

Table 2

Hierarchical Regression of Crowding Variables on Student Ratings of Teaching Effectiveness (n=393)

Variable	R^2	Adjusted R Square	β	t	p
Control Variable	.004	.001			
Class Size			-.240	-4.113	.000
Variables of Interest	.078	.071			
Enrollment Capacity			.228	4.036	.000
Room Capacity			.288	5.139	.000

Finally, research objective three sought to explain the variance in student ratings of course as a whole attributed to room capacity and course capacity when controlling for class size. The hierarchical regression model for enrollment capacity, room capacity and class size explained approximately 9.3% of the variance associated with the course as a whole rating of instruction. The model was found to be significant (F (3, 392) = 16.056, p≤.05). When controlling for class size, enrollment capacity and room capacity were found to be significant (p=.000), and uniquely contributed approximately 11% of the total variance in the course as a whole rating of instruction (see Table 3).

Table 3

Hierarchical Regression of Crowding Variables on Student Ratings of Course as a Whole (n=393)

Variable	R^2	Adjusted R Square	β	t	p
Control Variable	.017	.015			
Class Size			-.334	-5.814	.000
Variables of Interest	.110	.103			
Enrollment Capacity			.307	5.526	.000
Room Capacity			.280	5.084	.000

Conclusions/Implications/Recommendations

Based on the findings in this study, it was concluded that enrollment capacity, room capacity, and class size contributed to the statistical variance in student ratings of teaching effectiveness (7.4%) in a course and of the course as a whole (9.3%). It was further was concluded that when controlling for class size, enrollment capacity and room capacity were statistically significant, however, neither model explained a great deal of the variance in student ratings of instruction from a practical perspective. This finding is inconsistent with Gifford's (2007) findings, suggesting that crowding adds environmental stress and thus negative outcomes in a classroom.

Furthermore, class size alone hardly contributed to the overall models. This finding is inconsistent with the large body of literature that purports consistently lower ratings of instruction in larger courses (Monks & Schmidt, 2010). The findings imply that instructors can be effective, as perceived by students, in larger classes. Considering the breadth of research indicating negative impacts class size has on end-of-course student ratings of instruction, findings of this study suggest that, at least for these courses, some factor(s) other than class size impacted student ratings of instruction to a greater extent. While relative crowding within a class, as attributed to enrollment and room capacity, is associated with instructional ratings, this association is minimal.

Findings from this study suggest that departments in this particular setting are finding ways to "do more with less." Perhaps they are more efficient in coping with increased enrollment. Perhaps they are placing instructors in large classes who are more capable of teaching larger class sizes. It could be that instructors of the courses are more adept to adjusting their instruction to accommodate more students. This study illustrated that students can still be satisfied in courses with more students, however the study did not pinpoint the major source of that student satisfaction. It is recommended that researchers continue to explore sources of student satisfaction as well as instructor capacities. Further research in this area is warranted to better explain the remaining variance in student ratings of instruction.

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Learner Interaction Patterns in an Online Course Management System

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Introduction

The exponential growth of educational technologies has encouraged educational institutions to experiment with alternatives to the traditional classroom teaching methods (Favettoet et al., 2003). The interactive educational technologies include computer-generated simulations, videodiscs, CD-ROM, internet and the World Wide Web (Cavanaugh, 2001). Among these, web-based online course management systems have been gaining popularity due to its various tools and its facilitation of a variety of interactions among students, instructors and content (Bonk, 1999).

A study conducted with psychology students revealed that students who visited content pages more frequently showed greater academic performance than students who visited less frequently (Heffner & Stanley, 2005). Likewise, Miller (2008) found an association between learner interaction patterns and their academic performance. He explained that students who interacted more frequently with content, other learners and with the instructors attained greater academic performance in a single online course than students who interacted less frequently. However, Shih & Gamon's (2002) study found that there was no significant relationship between students' learning interaction patterns and their academic performance.

Use of online course management systems in education is a newly developing area. Only a few studies have addressed the association of learner interaction patterns and academic performance, and the results from these studies are inconclusive. Therefore, the research question addressed by this study was "Are students' interaction patterns associated with academic performance in online graduate level courses?"

Purpose and Objectives

The purpose of this study was to identify the association between students' interaction patterns and their academic performance in online graduate courses delivered by the Department of Agricultural Education and Studies at Iowa State University.

This study was guided by the following objectives.

1. Identify students' demographic characteristics including age, gender, academic classification, job/employment status, academic grades in a course, undergraduate grade point average and academic major.
2. Determine student interaction patterns in six online graduate courses.
3. Predict students' academic performance in online graduate courses using student interaction patterns and demographic characteristics.

Methods and Procedure

The population (N= 76) for the study consisted of graduate students who were enrolled in six online courses in the Department of Agricultural Education and Studies during a single academic year. Some students may have enrolled in more than one graduate online course offered by the department. However, the study considered each enrollment as a separate case due to the variety of constructs and instructor approaches.

Learner interactions were extracted by using the "student tracking" tool. The tracking tool records and stores the number of times a student visits various pages within the learning system. Online tracking is assumed to be a reliable tool for consistently and accurately recording students' interaction patterns based on the number of hits on specific areas/pages of the course.

Students' demographic information was obtained from the Director of Graduate Education in the Department of Agricultural Education and Studies. Out of 76 students, twelve students' demographics were not available in the records. Course grades were collected from the course instructor's records.

The first author contacted all online graduate course instructors in the Department of Agricultural Education and Studies, and asked permission to access their students' interaction data and grades. The first author also contacted the Director of Graduate Education in the Department of Agricultural Education and asked him to provide demographic information on graduate students enrolled in online courses.

Instructors were asked to provide grades of students in an Excel sheet along with the interaction data. Students who were enrolled in more than one online course were assigned the same code number. The code numbers were used to link demographic data with students' interactions and grades.

SPSS/PC version16 software was used to analyze the data. Descriptive statistics and Eta coefficients were used to summarize the data. Step-wise regression analysis was conducted to identify interaction patterns that could predict students' academic performance in online courses. Intercorrelations were computed among all dependent and independent variables.

Findings

Approximately 55% of the students (*n*=35) were female and 45.3% (*n*=29) were male. Thirty-five percent (n=23) of the students were full-time Graduate Students, followed by Agriculture Teachers 29.6% (*n*=19), Research Assistants/Associates 7.8% (*n* = 5), Inventory Lead 3.1% (*n*=2), Office Managers 3.1% (*n*=2), County Extension Directors 3.1% (*n*=2), Animal Care Inspectors 3.1% (*n*=2), Customer Care Coordinator 1.6% (n=1), Sales Representative 1.6% (n=1), Outreach & Research Coordinator1.6% (n=1), Pig CHAMP Tech Support 1.6% (n=1), Program Advisor at Iowa State University 1.6% (n=1), Agriculture Careers Employee 1.6% (n=1), State 4-H Youth Specialist 1.6% (n=1), and Associate Professor 1.6% (n=1).

Forty- two percent of the students (*n* = 27) had an undergraduate major in Agricultural Education, followed by Animal Science 20.3% (*n*=13), Agricultural Business 10.9% (*n* =7), Horticulture 7.8% (n = 5), Natural Resources 3.1% (*n*=2), Elementary Education 3.1% (*n*=2),

Physical Education 3.1% (*n*=2), Public Service and Administration 3.1% (*n*=2), Journalism 1.6% (n=1), Fisheries and Wildlife Sciences 1.6% (n=1), Distributed Studies 1.6% (n=1), and Dairy Science 1.6% (n=1). The mean age for the students was 31.23 years (*SD* = 8.97). The mean undergraduate GPA for the students was 3.11 (*SD* = .35).

Student Interaction Patterns

Table 1 shows that the most frequent learner interactions were number of threaded discussions read (M=2349.77, SD = 4287.92), followed by number of content folders viewed (M = 236.70, SD = 112.47). The mean for threaded discussions read was very high (M=2349.77); this may have resulted from students opening all threaded discussions using the compile messages function each time they visited the discussion section. It is also evident from the results that students tended to read messages more than post messages. The least frequent interactions were assignment submissions (M = 3.22, SD = 3.00) and chats entered (M = 4.29, SD = 7.96). There was a small difference observed between the number of assessments begun and the number of assessments ended; the reason might be that some assessments were started but not submitted due to technical errors or internet connectivity problems.

Table 2 shows that students who earned a grade of A or A⁻ or B⁺, B or B⁻ interacted more frequently than students with grades<B⁻ in several areas, including discussions read, content folders viewed, total sessions, mail messages read, discussions posted, assessment time, assessments began and assessments ended.

The Eta coefficient was used to determine the association between students' grades in a course and their interactions within the online course management system. Significant associations were found between grades in course and two of the interaction variables. Assignments read (η=.34), and total time spent with assignment tool (η=.32) had moderate and significant associations with grade in course. For significant results, Tukey's HSD Post-hoc test was conducted to determine how the groups A or A⁻, B⁺, B or B⁻ and < B⁻differ from each other. Students who earned a grade of <B⁻ read significantly more assignments and spent significantly more time with the assignment tool than did students who earned a grade of A or A⁻ or students who earned a grade of B⁺, B, or B⁻.

Table 1

Students' Interactions Recorded in Six Online Graduate Courses (n=76)

Variables	Mean	SD	Minimum	Maximum
Threaded Discussion Read[a]	2349.77	4287.92	20.00	22613.00
Content Folders Viewed	236.70	112.47	37.00	547.00
Files Viewed	120.54	115.04	3.00	454.00
Total Sessions	120.54	61.83	23.00	274.00
Total Time	48.58	29.48	12.14	163.18
Calendar Views	37.67	53.82	1.00	344.00
Web-Links Viewed	35.04	45.44	.00	201.00
Mail Messages Read	29.36	28.82	.00	154.00
Discussions Posted	27.97	17.72	9.00	91.00
Assessment Time	25.76	35.86	.00	169.37
Assignments Read	13.39	16.97	.00	106.00
Mail Messages Posted	7.71	6.79	.00	31.00
Assignment Time	6.96	15.32	.00	99.33
Assessments Begun[b]	5.74	5.58	.00	15.00
Assessments Ended[b]	5.21	5.52	.00	15.00
Chats Entered	4.29	7.96	.00	53.00
Assignment Submissions	3.22	3.00	.00	7.00

[a]The mean for threaded discussion read was very high (n=2349.77); students may have opened all threaded discussions using the compile messages function each time they visited the discussion section.

[b]A small mean difference was observed between the number of assessments begun and the number of assessments ended; the reason might be that some assessments were started but not submitted due to technical errors/internet connectivity problems.

Table 2

Association between Students' Academic Grade in Course and Learner Interactions Recorded by Online Course Management Systems

Variables	Interaction	A or A⁻ (n=52) M (SD)	B⁺, B or B⁻ (n=20) M (SD)	< B⁻ (n=4) M(SD)	η
Threaded Discussion Read[a]	LC,LI,LL	2371(4778)	2554(3254)	1056(1417)	.07
Content Folders Viewed	LC	251(121)	206(86)	201(84)	.19
Files Viewed	LC	106(109)	153(117)	154(176)	.19
Total Sessions	LC,LI,LL	124(66)	120(47)	74(42)	.18
Total Time (Hours)	LC,LI,LL	49(32)	48(24)	48(19)	.00
Calendar Views	LC	30(47)	57(69)	38(34)	.22
Web-Links Viewed	LC	42(49)	16(27)	46(51)	.25
Mail Messages Read	LI,LL	33(32)	24(20)	16(18)	.18
Discussions Posted	LC,LI,LL	30(19)	25(14)	18(9)	.19
Assessment Time (Hours)	LC	30(40)	19(25)	7(14)	.17
Assignments Read	LC	14(13)	8(13)	35(48)	.34*
Mail Messages Posted	LI,LL	8(7)	8(6)	8(11)	.03
Assignment Time (Hours)	LC	7(12)	3(10)	27(49)	.32*
Assessments Began	LC	6(6)	6(5)	2(5)	.15
Assessments Ended	LC	6(6)	5(5)	1(2)	.18
Chats Entered	LI,LL	4(6)	4(12)	6(10)	.03
Assignment Submissions	LC	4(3)	2(3)	4(3)	.021

Note. LC = Learner-Content; LI= Learner-Instructor; LL = Learner-Learner.
[a]The mean for threaded discussions read was very high (n=2349.77); students may have opened all threaded discussions using the compile messages function whenever they visited the discussion section
*p < .05

The intercorrelations matrix showed that collinearity was present between the variables of number of assessments began and number of assessment ended (r =.97); number of assignments read and time logged into assessment (r = .82). However, none of these variables were used in stepwise regression analysis because of their negligible association with grade in

course. Grade in course was significantly correlated with undergraduate grade point average, r = 0.27; number of discussions posted (r = 21), number of content folders viewed (r = 0.21).

Forward stepwise regression was conducted to determine the extent to which independent variables were able to predict students' academic performance. Only variables with significant bivariate correlations with grade in course were included in the regression analysis. Table 3 shows that undergraduate grade point average explained a significant proportion of the variability in course grade. Undergraduate grade point average uniquely accounted for 7.3% (R^2 = .073) of the variability.

Table 3

Stepwise Regression of Student Course Grade (GPA) on Selected Independent Variables (n=64)

Variable	R^2	Adjusted R^2	R^2 Change	P
Undergraduate grade point average	. 073	.058	.073	.031

Note: Regression included independent variables of undergraduate grade point average (r=0.27; number of discussions posted (r =21), number of content folders viewed (r = 0.21).
   *p<.05.

Conclusions

The following conclusions are based on the findings of the study:

1. Most students in the study were pursuing a master's degree in Agricultural Education and their employment was in an agriculture-related field.
2. The most frequent student interaction within the online course management system was reading discussion posts.
3. The least frequent student interaction within the online course management system was assignment submissions.
4. Students who interacted more frequently within the online course management system had higher grades in their online course than students who interacted less frequently.
5. The single best predictor of student academic performance in online graduate courses in Agricultural Education was undergraduate grade point average.

Recommendations

The following recommendations were drawn from this study

- This study focused only on Agricultural Education online courses. The study should be expanded by including courses in other disciplines.
- Educators and instructional material designers need to understand learner interaction patterns and learning outcomes in order to better design and implement online courses.

- Instructors should use online course tracking information to assess and monitor students' interactions within the course and adjust teaching methods accordingly to promote effective learning.

Implications for Agricultural Education

The findings have implications for Agricultural Education instructors and instructional designers for better designing and implementing online courses. Understanding student interactions gives feedback to instructors to understand overall student performance and behavior in an online course.

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Barriers to Urban Students' Participation in the National FFA Organization

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Introduction and Framework

Urban youth engaged in after-school organizations have more positive attributes compared to their unengaged contemporaries (Quane & Rankin, 2006). At-risk children demonstrate an increased level of positive behaviors and decreased level of negative behaviors when engaged (Scott-Little, Hamann, & Jurs, 2002). Youth engagement in out-of-school activities has grown to be a significant thread of research (Harvard Family Research Project [HFRP], 2004, 2006, 2008), though data tend to be generic to all after-school programs (Fashola, 1998). The FFA is an inter-curricular organization with after-school components having multiple benefits for students (Phipps et al., 2008). Yet, urban agriculture students do not participate in the FFA at the same levels as rural agriculture students **(**Team Ag Ed, 2006**).** Considering the potential benefits for urban students, why the disparity?

Agricultural education research on urban settings has focused on a variety of issues, including the agriculture knowledge of students (Pense & Leising, 2004; Trexler, 2000), career choice of students (Esters & Bowen, 2005), reasons for enrolling in agriculture programs (Esters & Bowen, 2004; Talbert & Larke, 1995), issues facing teachers (Warner & Washburn, 2009), students' preferences of leadership development (Anderson & Kim, 2009), and interventions to increase FFA participation (Roberts, et al., 2009). One of the few studies to focus on barriers of diverse students was LaVergne, Larke, Elbert, & Jones (2011). Texas agriculture teachers reported that diverse students lacked role models and information about agricultural education programs. A gap in the literature still exists about urban students' barriers to FFA participation.

Barriers to students' decision to engage in their FFA chapter's activities were conceptualized to involve a variety of influences. Previous research indicated numerous barriers to urban students participation in after-school activities, including lack of transportation (HFRP, 2004; US Department of Education, 2003), family responsibility (Borden et al., 2005; HFRP, 2004; Sanderson & Richards, 2010**)**, parental encouragement (Sanderson & Richards, 2010; Simpkins, Davis-Kean, & Eccles, 2005), and safety (HFRP, 2004; Sanderson & Richards, 2010). Researchers have also conceptualized the barriers of student participation as student characteristics, perceptions of family and friends, school characteristics, and neighborhood characteristics (Weiss, Little, & Bouffard, 2005). These barriers formed the conceptualization of this study. Agriculture teacher and program were adopted as barriers for this study to provide a contextual perspective. Agricultural education researchers have not identified the barriers that inhibit urban students from participating in the FFA. Identifying the barriers facing urban students can help teachers, stakeholders, and teacher educators design urban FFA programs to overcome the problem of lack of participation.

Purpose

The purpose of this descriptive study was to explore barriers to participation in FFA among urban high school agriculture students in one Midwestern, urban school district. The objectives were:

1. Describe the FFA involvement of students

2. Describe the barriers students encounter to FFA participation

3. Describe the barriers students encounter to FFA participation by the FFA involvement of students

The study aligns to priorities four and five of the National Research Agenda (Doerfert, 2011).

Methods

The target population was all agriculture students in a metropolitan school district in the Midwest. The school district served urban population of over 300,000 people. The sample was time and place of the urban metropolitan students studied in Missouri. Three programs were identified with a student population of 99 students. Seventy students were surveyed for a response rate of 70.7%. A breakdown of the race of the students revealed that 61.4% were Black, 18.6% were White, and 19.4% were multiple races. Eighty percent were female and 20% male. The survey was administered during a single setting with each class.

The questionnaire had two parts: time involvement in FFA and barriers to participation in the FFA. Time involvement originally had five levels; however, it was collapsed to three levels to obtain a more even distribution across groups: not a FFA member; a member but has not participated in any activity; and a member and has participated in at least one activity. The questions about barriers were adopted from a study by Rayfield, Compton, Doerfert, Fraze, and Akers (2008). The adaptions included the development of constructs based on the conceptual framework from Weiss, Little, and Bouffard (2005) and the wording of questions to reflect barriers rather than opportunities. An example of a question included, "I have to care for family members after school" with a five-point Likert-type scale with 1 = Strongly Disagree to 5 = Strongly Agree.

The survey was subjected to a review by a panel of experts to ensure the face and content validity. A pilot test of the survey was conducted at a similar program in a similar large school district. The researchers intended to utilize constructs; however the reliability coefficients of the pilot were too low. A test-retest reliability analysis was conducted during the pilot and all items were above 80% agreement. Thus, the researchers reported the data as individual items. Descriptive statistics and ANOVA with post hoc procedures with the each variable (i.e. item by item analysis) were calculated. The post hoc procedures conducted included LSD (Field, 2005). An alpha of .05 was established *a priori*.

Findings

The findings for objective one included 27% of students not being members, 21% students were members in name only, and 51% of students were active members. The findings for objective two included two items receiving the highest means: our FFA chapter is not well known by other students in the school and my neighborhood does not value our FFA chapter. The following items received the lowest means: if I joined the FFA chapter, I would be teased by my friends and my agriculture teacher(s) does not support participation in the FFA chapter. The analysis of objective three found significant differences within nine items. All findings were summarized in Table 1.

Table 1

Barriers to Participation Item Analysis According to Student's Time Involvement in the FFA

Items	n	M (SD)	Not a Member $n = 19$ (27%)	Only a Member $n = 15$ (21%)	Active Member $n = 36$ (51%)	F
Our FFA chapter is not well known by other students in the school	69	2.75 (1.25)	2.68 (1.16)	2.47 (1.30)	2.91 (1.29)	0.50
My neighborhood does not value our FFA chapter	69	2.53 (1.29)	2.21 (1.13)	2.40 (1.45)	2.40 (1.33)	0.87
I have to care for family members after school	70	2.46 (1.34)	2.74 (1.48)	2.78 (1.21)	1.63 (1.07)	0.17
I am too busy with other school activities	69	2.46 (1.24)	2.89 (1.49)	2.67 (1.05)	2.14 (1.12)	0.08
I have no transportation to get to the FFA activities	69	2.38 (1.21)	2.84 (1.17)	2.73 (1.16)	1.97 (1.15)	0.02*
People within the school do not support the FFA chapter	68	2.32 (1.29)	2.26 (1.24)	1.86 (1.03)	2.54 (1.38)	0.24
I am getting ready to go to college after high school and the FFA doesn't help with that	69	2.25 (1.08)	2.63 (1.12)	2.07 (1.03)	2.11 (1.05)	0.19
I am too busy working at my after school job	68	2.24 (1.32)	2.58 (1.43)	2.36 (1.45)	2.00 (1.19)	0.29

Table 1 (continued)

Barriers to Participation Item Analysis According to Student's Time Involvement in the FFA

| | | | M (SD) | | | |
| | | | Not a Member | Only a Member | Active Member | |
Item	n	M (SD)	n = 19 (27%)	n = 15 (21%)	n = 36 (51%)	F
My neighborhood does not value involvement in community activities	69	2.23 (1.21)	2.11 (1.24)	2.47 (1.30)	2.20 (1.18)	0.68
The FFA does not relate to my life	69	1.97 (1.12)	2.21 (1.23)	1.60 (0.91)	2.00 (1.14)	0.29
The FFA activities takes up too much time	66	1.94 (0.91)	2.50 (0.99)	2.29 (0.73)	1.50 (0.71)	0.00*
The FFA chapter does not fit into the activities and beliefs of the school	66	1.88 (1.09)	2.44 (1.38)	1.87 (0.92)	1.58 (0.87)	0.02*
I cannot see the benefits of our FFA chapter	69	1.87 (1.10)	2.00 (1.25)	1.67 (1.23)	1.89 (0.96)	0.68
I do not believe FFA activities are fun	69	1.87 (0.98)	2.21 (1.080	1.60 (0.83)	1.80 (0.96)	0.17
None of my friends are FFA members	69	1.75 (1.05)	2.42 (1.43)	1.67 (0.90)	1.43 (0.65)	0.00*
The FFA chapter does not fit into the activities and beliefs of the community	69	1.75 (0.96)	2.32 (1.16)	1.73 (0.88)	1.46 (0.74)	0.01*
I am concerned about safety during after school activities	69	1.72 (1.00)	1.95 (1.18)	2.13 (1.06)	1.43 (0.78)	0.04*

Table 1 (continued)

Barriers to Participation Item Analysis According to Student's Time Involvement in the FFA

Item	n	M (SD)	M (SD)			F
			Not a Member $n = 19$ (27%)	Only a Member $n = 15$ (21%)	Active Member $n = 36$ (51%)	
My sibling(s) do not encourage participation in the FFA chapter	69	1.65 (1.00)	1.74 (1.05)	1.67 (1.11)	1.60 (0.95)	0.89
My principal(s) does not support participation in the FFA chapter	69	1.64 (1.03)	1.84 (0.96)	1.40 (0.91)	1.63 (1.11)	0.47
My parent(s) or guardian(s) do not encourage participation in the FFA chapter	69	1.55 (0.99)	1.95 (1.27)	1.80 (1.21)	1.23 (0.49)	0.02*
Popular students do not join the FFA	69	1.51 (0.85)	1.68 (0.89)	1.40 (0.74)	1.46 (0.89)	0.56
My neighborhood offers better after school activities than FFA	69	1.49 (0.74)	1.58 (0.69)	1.47 (0.74)	1.46 (0.78)	0.84
My school counselor(s) discourages participation in the FFA chapter	69	1.29 (0.55)	1.47 (0.61)	1.47 (0.74)	1.11 (0.32)	0.02*
If I joined the FFA chapter, I would be teased by my friends	68	1.25 (0.53)	1.53 (0.77)	1.13 (0.35)	1.15 (0.36)	0.03*
My agriculture teacher(s) does not support participation in the FFA chapter	69	1.23 (0.57)	1.26 (0.45)	1.33 (0.90)	1.17 (0.45)	0.64

Note. *p < .05

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The post hoc analysis of the nine items identified as significant revealed how the means differed between each of two of the three levels of the time involvement and the barriers. Table 2 reports the ANOVA ad hoc analysis.

Table 2

Post Hoc Analysis of Item According to Student's Time Involvement in the FFA

Items	Significant Difference Between		
	Not a Member & Only a Member	Not a Member & Active Member	Only a Member & Active Member
The FFA chapter does not fit into the activities and beliefs of the school	X	X	
The FFA activities takes up too much time		X	X
I have no transportation to get to the FFA activities		X	
If I joined the FFA chapter, I would be teased by my friends	X	X	
My school counselor(s) discourages participation in the FFA chapter		X	X
None of my friends are FFA members	X	X	
My parent(s) or guardian(s) do not encourage participation in the FFA chapter		X	
The FFA chapter does not fit into the activities and beliefs of the community		X	
I am concerned about safety during after school activities			X

Note. Significance for LSD

Discussion

The post hoc analysis revealed significant differences between non-members and active members within the barriers related to friends, family, school, and the community. Significant differences also existed between non-members and active members or non-active members in the barriers of perceptions of friends and school. The findings concerning the influence of friends and family complimented the findings of LaVergne et al. (2011) that diverse students need role models in agricultural education. Items regarding transportation and family encouragement echoed the findings from other educational studies (HFRP, 2004; **Sanderson & Richards, 2010;** Simpkins, Davis-Kean, & Eccles, 2005; US Department of Education, 2003). The findings about the role of the students' friends also complimented the findings of the study by Rayfield et al. (2008).

The implications are important for stakeholders of urban FFA programs. The perceptions of friends, family, and community need to be addressed when recruiting members. Urban FFA chapters might need role models that can reach out to the student population and families (LaVergne et al., 2011). FFA advisors should consider how their FFA chapter fits into the culture of the school. This means rethinking the activities of the chapter (Roberts et al., 2009).

More research is needed to explore how agriculture teachers can overcome barriers to urban student's participation in the FFA. The research can take two directions: (1) study the interventions and activities of successful urban FFA chapters, and (2) research that envisions FFA chapters focusing exclusively on urban students. These explanations could help stakeholders design FFA chapters that appeal to more urban students.

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Exploring Whiteness in Agricultural Education through a Teacher Narrative

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Introduction

The cultural identity of White agriculture teachers influences the involvement of students of color in agricultural education (Vincent & Torres, 2011). This finding looms large as students of color will eventually out number their White counterparts (Moule, 2011). For instance, demographers predict Latinos will represent 25% of the population by 2050 (Sleeter & Grant, 2007). Shifts in the Nation's demographics will trickle down agriculture classrooms. As such, agriculture teachers need the ability to connect with students of color (Cano & Moore, 2010). Recent research suggests agriculture teachers need more training for working with diverse students (Talbert & Edwin, 2008), interventions can increase Hispanic student participation in the FFA (Roberts, Hall, Gill, Shinn, Larke, & Jaure, 2009), and students need more diverse role models in agricultural education (LaVergne, Larke, Elbert, & Jones, 2011). Educational theorists argue the culture of teachers has a significant role in teaching students of color (Giroux, 1997; McLaren & Muñoz, 2000). The decline of African-American teachers and students after the desegregation of agriculture education in the 1960s validates this claim in agricultural education (Wakefield & Talbert, 2003). Cultural differences can hinder the development of classroom communities and student engagement. Could the culture of the predominantly White agriculture teachers be a barrier to diverse students' engagement in agricultural education? This study explores the culture of agriculture teachers through a teacher narrative.

A Framework of Whiteness

The researchers utilized Whiteness theory as the theoretical framework. Whiteness examines the culture unique to White people (Delgado & Stefancic, 2001). Whites generally view themselves as cultureless because White culture dominates society (i.e. cannot see the forest for the trees). The major principles of Whiteness include color-blindness and meritocracy. Color-blindness and meritocracy argue for treating everyone equally and anyone can succeed, if they work hard enough. While Whites may view these principles as universal, not all groups share these beliefs (Epstein, 2000; Lewis, 2001, 2004; Picower, 2009). The framework of Whiteness helps explain why White teachers struggle to connect with students of color (Giroux, 1997; Kincheloe & Steinberg, 1997; Landsman, 2001; Marx, 2008; Sleeter, 2008; Tatum, 1999). For instance, Bonilla-Silva and Forman (2000) utilized Whiteness theory to design a questionnaire and conduct interviews exploring the racial attitudes of White undergraduate students. The findings highlight a tendency for White students to be more openly prejudiced in the interviews rather than the questionnaire. Whiteness literature argues that White teachers are not problematic; White teachers that fail to recognize how culture affects classrooms are problematic.

Purpose

The purpose of this thematic narrative study was to characterize how the Whiteness of an agriculture teacher shaped her interactions with diverse students. The narrative focused on

Susan, who was a traditional (female, White, rural background) agriculture teacher working at Cartwright High School, which was a non-traditional (diverse, urban) school. This study aligns with priority five of the National Research Agenda (Doerfert, 2011).

Methodology and Data Analysis

This study was conducted within a critical epistemology which claims reality is socially constructed with power and opportunity distributed unequally in society (Crotty, 1998). The researchers: (1) took the role of the interviewer, (2) took an active role in the formation of the narrative, (3) acknowledged and brought their bias forward, (4) actively steered the teacher toward discussing interactions between the teacher and her students, and (5) probed the teacher's understanding of culture. The research employed a thematic narrative data analysis approach following the framework of Whiteness (Riessman, 2008). The thematic narrative approach allowed themes to emerge succulently within the interview rather than pulling themes out of the interview. Data sources included three interviews with the teacher, the interviewer's notes, the teacher's documents from college, and a field observation of the classroom. The researchers transcribed all data sources. The interviews ranged between 30-60 minutes.

This study focused on the first interview with teacher and the interviewer's notes. The data analysis process began by analyzing the transcript and notes. The researchers isolated episodes within the transcript and notes. Episodes were succinct sections within the interview and notes that focused on a single theme. Themes included discipline, student engagement, and cultural identity. The researchers then coded episodes according to the framework of Whiteness (Riessman, 2008; Williams, 1997). Only one episode, cultural identity, was described in the findings of this abstract because of the interviews length, depth of the episodes, and constraints of the abstract requirements. The researchers wrote the findings from the interviewer's point of view. The findings contained the thoughts of the interviewer from the interview notes. The inclusion of the interviewer's thoughts allowed the reader to follow the logic of the interview (Williams, 1997). The findings also contained references to Whiteness research to position the interviews within the theoretical framework (Riessman, 2008)

Multiple strategies helped build the trustworthiness of the study. The strategies included thick quotations and inclusion of the researcher's bias in the findings. Transferability of the findings depends of the ability of the reader to relate their contexts to the narrative. The researchers provided long and rich quotes to facilitate readers ability to relate the interview to other teachers (Ary, Jacobs, & Razavieh, 2002; Riessman, 2008).

Context

Susan was a White female from a Midwestern farm family. The interviews happened during the second semester of her first year. She described her agriculture program in high school as traditional (focused on production agriculture). Susan majored in agricultural education (teacher certification) at a Land Grant University. She had taken the required multi-cultural courses in her program and a year of graduate courses at the same institution. Though Susan intended on teaching in an agriculture program like her old high school, she took a position at Cartwright High School after one year of graduate school. Susan gave the impression she took the job because she was recruited by the principal. Cartwright served a metropolitan

community of over 250,000 people. The school was situated in the outskirts of the urban center and adjacent to a popular ethnic center of the city. The agriculture program had less than 50 students with the majority being students of color. Susan described the school as a great place to teach. Yet she had trouble connecting with her diverse students, which lead to the discussion of her cultural identity. The researcher was White, male, from a rural background, and previously taught students of color at an urban high school. The researcher knew the Susan before the project began, which helped foster an open atmosphere about sensitive issues.

Findings and Discussion

Susan just finished talking about how her undergraduate education program had not prepared her to be an urban agriculture teacher. I wanted to guide Susan to the discussion of her students. I asked, "What was your biggest surprise with the students"? Her response interested me. "I think the biggest shock for me… has been some of the behavioral issues that I have had. I have had a tough time relating to the students. We come from totally different backgrounds*".* This answer demonstrated she had limitations with her students. Researchers indicate teachers need to have a clear rationalization of their own culture (Picower, 2009; Sleeter, 2008). Maybe Susan understood the larger issue facing her; she never had to examine her own culture (Rivière, 2008; Vaught & Castagno; Ullucci & Battey, 2011).

Susan tried to articulate her culture with her next statement. She described her working relationship with students in the FFA and students not in the FFA.

> I have spent enough time with [students in the FFA] so that we have a really good
> working relationship. And then there are some students that have behavioral
> issues and we don't have that good working relationship. I think that is the
> biggest shock.

I felt frustrated by these comments. I knew the FFA played a critical role in Susan's education; maybe she believed the FFA should play an equally important for her students. She seemed to transplant her values onto her students. I probed Susan about her cultural identity, "Did you have a good handle on what your cultural background was before you went here"? She paused before answering. "I don't really know... I don't really know if I truly knew who I was when I came in here".

Susan's lack of cultural identity typified White teachers (Perry, 2001). She only thought about her professional identity. "I think when I started out I was close minded on what an ag program was. I very much wanted something that was traditional". Susan's inability to think about her and her students' cultural identity indicated her cultureless perspective through color-blindness (Bonilla-Silva, 2007; Mazzei, 2007). Susan had an awareness of her students' differences, yet she only talked about working with FFA members and the content lessons. Her color-blindness regulated her analysis to the professional identities of the classroom and not the cultural identities. I had to listen to what Susan did not say as much as what she did say. She did not talk about being a White, rural teacher in a classroom of diverse, urban students.

I wanted her to talk about herself culturally; did she see herself as having any cultural identity? My own experience in a diverse classroom kept creeping into my head. I had

awareness of the cultural differences of my students of color, even if I did not completely comprehend the differences. My school district had paid for me to receive Ruby Payne training in my first year (Payne, 2005). I avoided saying the word White because I wanted Susan feeling comfortable. I asked, "How do you think you have grown personally"? Her answer would illustrate she sees herself as cultureless (Lewis, 2004).

> I don't really know. I don't really know if I have learned anything. I don't really reflect about what I learn personally. I always reflect on what I learn about how teaching is going. We talk about, the other first year teachers that are here, we get together all we talk about is teaching and what we are doing in our classes. I guess I really never take the time to sit down and think about how I have personally grown in this process of my first year of teacher….

I stopped short on asking more questions. Race is a difficult issue for White teachers to discuss (Dickar, 2008; Perry, 2001), which was evident for Susan. I began asking about her FFA program instead.

Concluding Thoughts and Future Directions

Susan may have difficulty bridging the cultural gap with her students because she could not articular her own culture. For instance, she viewed student interaction through the framework of her FFA experiences, even though her students did not share her experiences. If Susan could realize the cultural differences, she might have had more success connecting with students based on their interests. Susan's Whiteness, in particular her color-blindness, limited her ability to think from the students' perspective. However, Susan's lack of understanding of her own culture (i.e. her cultureless) represented a greater barrier than Susan actually being White. This was just one narrative, yet Susan's inability to identify her own culture conceptually aligned with previous agricultural education studies and highlighted how some agriculture programs may not be well serving diverse student populations (Bowen, 2002; Cano & Moore, 2010; LaVergne et al., 2011; Talbert & Edwin, 2008).

Dialogues about culture need to occur in agricultural education. Pre-service teachers and teachers must have instruction that exposes their own culture. The cultural instruction does not have to alter the teacher's belief system. White teachers do not have to become someone different. White teachers who are culturally aware can be successful with diverse students (Marx, 2008). Researchers need to explore the role of culture in agriculture classrooms. For instance, does color-blindness permeate the components of agricultural education? An educational structure which treats every student the same is detrimental to those students that do not share the same culture (Ladson-Billings & Tate, 1995). These are issues worthy of study and reflection. As students of color become more involved in agricultural education, White agriculture teachers need to develop the ability to culturally self-reflect.

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Agricultural Education Student Performance on a State Science Graduation Test

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Introduction

Teaching science through the high school agriculture classroom is effective (Roegge & Russell, 1990). Student interest and achievement in science is often captured by reference to real world examples (National Research Council, 1988). Agriculture teachers can grab student interest by providing students with diverse and real world experiences in science through the applicable subject of agriculture (Boehm, 2002). Substantiating these notions, teachers of both science and agriculture have agreed that the applied nature of agricultural education is an appropriate venue to help students understand science (Balschweid & Thompson, 2002; Warnick, Thompson, & Gummer, 2004). Furthermore, research in agricultural education (Chiasson & Burnett, 2001; Connors & Elliot, 1995; Ricketts, Duncan, & Peake, 2006; Roegge & Russell, 1990) has supported the significant impact the integration of science-based material and constructs into the agricultural education classroom has had on multiple measures of student performance, including standardized testing.

A shift toward standardized performance continues to play a role in the evaluation of secondary student's academic performance. States have reduced elective course choices and allowances in the core high school curriculum to make room for more math and science requirements. Consequently, attainment of a well-rounded education in the public schools has been diminished as measured by course choices. Diverse educational experiences expose students to more than just the core academic programs that fulfill graduation requirements. Student success through diverse educational experiences was demonstrated through a study performed by the Iowa Department of Education (IDE). Gruis (2006) reported FFA members performed significantly more proficient on standardized tests than non-FFA members.

The demands on teachers of agricultural education throughout the United States to provide adequate data outlining the benefits that agricultural education courses give to students is ever-increasing. Elective courses, including agricultural education, are left with the need to sustain their worth. Need exists for agricultural education programs to support the positive relationship the agricultural education classroom has on student's academic performance measured by standardized graduation tests. Additionally, because evidence was needed to document this need, this study was undertaken.

Theoretical Framework

The researchers formed the foundation of this study from previous research within agricultural education along with assumptions of high school educational practitioners on the applications of science in agricultural education. "All students need an understanding of basic science concepts. Teaching science through agriculture incorporates more agriculture into the curricula, while more effectively teaching science" (National Research Council, 1988, p. 11). Sparace and Layfield (2003) reported agricultural teachers were in a strategic position to positively impact the science education of our young citizens. Students better assimilate and

practice higher order cognitive skills through agricultural education when biological and physical sciences are infused into the curriculum (Ellibee, 1999). Budke (1991) acknowledged that the agricultural education classroom provided the ideal setting for demonstrating applied biological and physical science principles. Furthermore, Kirby (2002) postulated that students enrolled in agriscience programs will be more efficient and effective processors (because of their applied science experience).

Purpose and Objectives

The purpose of the study was to describe the relationship between passage rate of the science subject portion of the [State Test] and concurrent high school student enrollment in agricultural education courses. To accomplish the purpose of the study, three objectives were established. They are:

1) Describe student achievement on the science portion of the [State] Graduation Test who are enrolled and not enrolled in agricultural education courses.

2) Describe the difference in student achievement on the science portion of the [State Test] between those enrolled in agricultural education courses and those not enrolled in agricultural education. H_o: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 \neq 0$

3) Describe the relationship in passage rate of the science portion of the [State Test] in the initial testing between those enrolled in agricultural education and those not enrolled in agricultural education.

Methods

This descriptive correlational study examined [State] Graduation Test results for high school sophomores during the academic years of 2005-2006 and 2006-2007 related to the student's enrollment or non-enrollment in agricultural education courses. Measures were taken to separate students who were enrolled in agricultural education courses during the sampled years of 2005-2006 and 2006-2007, from their peers who were not enrolled in such courses during the selected years. Three-hundred twelve (N=312) students were analyzed from the two schools included in this study. Male students (*n*=172) made up 55.1% of the sample and female students (*n*=140) were 44.9% of the sample. Ethnicity was homogeneous as 99.0% (*n*=309) identified as Caucasian, three (1%) students were "other", according to the schools' transcripts. The sample mean grade point average was 2.90/4.0 and 11.90% (*n*=37) had a high school individual education plan (IEP).

A comparison of the overall passage rate on the initial testing mandated by the [State Test] was made between the subsets. The minimum passing score of 400 for the science test was outlined by the [STATE] Department of Education determined proficiency. Hypotheses were tested at the .05 level of significance. The decision to reject H_o if p ≤ α 0.05, was set *a priori.*

The two agricultural education programs used in this study were purposefully selected because each school granted science credit for students enrolled in Agriculture Science I and/or II during freshman and sophomore years. The researchers acknowledge the results of this time and place sampling cannot be generalized beyond the two schools. While all subjects in the

study were minors, the researchers did not have contact with the subjects. The respective school principals granted the researchers permission to collect data for the years outlined in the study from each student's high school transcripts. Confidentiality between the researcher and the school was maintained by guaranteeing no student names or other identifiable information would be used in the study. All data collection was confined to each participating school building. No paperwork was removed from the schools, providing another layer of confidentiality.

Findings

Results for the objectives researched revealed the subset of agricultural education students performed as well or better on the science portion of the [State] graduation test compared to students not enrolled in agricultural education courses. Table 1 outlines the scoring ranges and proficiency categories during the years of testing analyzed in this study. Table 2 shows results of objective one; the performance comparison of both schools on the state science test.

Table 1

[STATE] Graduation Test Performance Scores

Test	Performance Level	Scaled Score Range
	Advanced	445-592
Science	Accelerated	425-444
	Proficient*	400-424
	Basic	371-399
	Limited	219-370

*Proficient level connotes minimum passing score.

Agricultural education students from School A performed slightly better than peer students not enrolled in agricultural education. The average student and one standard deviation above from School A scored in the accelerated performance level described in Table 1. Average School B agricultural education students scored short of the accelerated performance level. The agricultural education students from both schools had lower standard deviations and a tighter range of passing scores as compared to peers not enrolled in agricultural education. However, agricultural education students did not achieve the highest scores in the range for each school.

Table 2

Objective 1: Agricultural Education vs. Non Agricultural Education Student's Science Test Performance (N=312)

	Science Scores			
	n	Mean	S.D.	Range
School A				
Ag.Ed.	42	425.62	16.24	401-469
Non-Ag. Ed.	101	425.34	21.15	400-486
School B				
Ag.Ed.	72	423.80	15.50	400-458
Non-Ag. Ed.	97	425.19	20.05	400-479
Total (*N*)	312			
Ag. Ed.	114			
Non-Ag. Ed.	198			

The results of the Independent-Samples t-test performed between students enrolled and not enrolled in agricultural education and their performance on the state science test for objective 2 is found in Table 3. The researchers determined no significant differences exist between the two groupings of students at either school and their scores on the science test and the null hypothesis was retained.

Table 3

Difference between enrollment type and science test performance

	Equal Variances Assumed p	Decision
School A	.940	Retain Ho: No Difference
School B	.629	Retain H_o : No Difference
All	.722	Retain H_o: No Difference

The findings of objective three are outlined in Table 4. The researchers concluded that agricultural education students in the study passed the science portion of their graduation testing at an 11.1% higher rate, upon the completion of the initial testing, compared to peers who were not enrolled in agricultural education. Fewer students ($n=295$) provided usable data for this comparison as opposed to the previous objectives ($n=312$). A Two-Way Chi Square analysis result (.018) determined significance ($\alpha=0.05$).

Table 4

Objective 3: Independence of agricultural education enrollment and passage of science test

[State Test] Test Performance	Agricultural Education Enrollment	
	Yes	No
Pass Test on First Attempt	98 (88.3%)	142 (77.2%)
Not Pass Test on First Attempt	13 (11.7%)	42 (22.8%)
Chi-Square Sig.	.018	

Conclusions, Implications, and Recommendations

Students enrolled in agricultural education courses during the academic years of 2005-2006 and 2006-2007 at the two schools in this study achieved a passing score on the [STATE] science graduation test at a significantly higher rate than peer students not enrolled in agricultural education during the first attempt of the test. The study supports previous research (Ricketts, Duncan, & Peake, 2006) attesting to agricultural education students' demonstration of higher science proficiency on state standardized tests. Further, the 2004 Iowa Test of Educational Development (ITED) produced similar results with 11th grade FFA members who scored 11.1% higher on the science test as compared to students not in the FFA (Gruis, 2006). Many of the students in this study were only enrolled in agricultural education for one year prior to their testing battery during their sophomore year. Agriscience education gave students an advantage in standardized testing for the specific schools in the study.

No significant differences were reported relative to average score performance between students enrolled and students not enrolled in agricultural education courses. The two agriscience programs prepared students comparably to students taught in the science classroom. Enrollment in agricultural education may not yield a higher level of science proficiency on average, but it is not a detriment to student's proficiency. Similar results were reported in both Chiasson and Burnett (2001) and Connors and Elliot (1995).

Agricultural educators consistently push the validity of their programs by claiming the material they teach is science-based and that agricultural education enhances the student academic experience. The results of this study for the two schools demonstrated agricultural education provided a sufficient proficiency in foundational science knowledge. School systems offering agricultural education need to encourage students to enroll in agriculture courses. School systems need to embrace the science-based curriculum disseminated in agricultural education classrooms. Department of Education staff and agricultural education teachers need to continue to align the standards and curriculum of agricultural education with the general sciences to ensure students reach the most important benchmarks without compromising the agricultural education classroom's applied nature.

Future studies evaluating a larger population of students should be performed to discover consistent relationships between student enrollment in agricultural education courses and student's subsequent performance on standardized science evaluations. State Departments of Education and Career Technical Education could implement similar data collection and analysis as a cohort longitudinal design. Collecting and analyzing existing student data from other schools and states for future replicated studies could prove rewarding for the profession and must be completed.

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A Case Study on the Perceptions of Students at Two-Year Institutions Toward a Recruitment Visit about Agricultural Education at a Four-Year Institution

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Introduction

Concern about the substantial decline in students enrolling into agriculture programs at all levels has been significant, and much research and financial resources have been devoted to identifying and addressing the problem (Wildman & Torres, 2001). According to Gibbs (2005), this decline can be attributed to many people having little agricultural knowledge due to large populations moving from rural farm areas to more urbanized areas, which supports the need for agricultural education in schools. However, the problem of teacher shortages and less access to secondary agriculture programs has been around for at least the past 40 years (Kantrovich, 2010). Teacher shortages have the potential to reach epidemic proportions if we are unable to recruit additional students into the field of agricultural education (Kantrovich, 2010). Thus, the recruitment of students into teacher preparation programs must be a priority to maintain agriculture programs (Thorson & Anderson, 2010).

Previous studies have concluded that the factors that influenced enrollment in agricultural education programs the most were personal desires, past experiences, organizational affiliations, and persons of influence (e.g., parents, teachers, and former agriculture students or friends) (Donnermeyer & Kreps, 1994; Reis & Kahler, 1997; Wildman & Torres, 2001; Vincent, Ball, & Anderson, 2009). As enrollment numbers continue to decrease for agricultural education programs, more information is needed about the most effective methods of recruiting students into these programs at four-year institutions. Recruitment is not only an important topic to agricultural education programs because of the importance of filling teaching positions across the country, but a decreased number of agriculture instructors teaching may lead to a shortage of qualified people to fill positions in the agriculture industry (Goecker, G. Smith, E. Smith, & Goetz, 2010; USDA, 2010). Therefore, agricultural educators must continue to investigate effective ways of recruiting qualified individuals into agricultural education while taking into account current-day obstacles such as limited recruitment resources, educational choices based on personal economic issues, and a changing demographic of students going into agriculture. Consequently, what are the perceptions of agriculture students about agricultural education at a four-year institution after participating in a recruitment presentation by a campus representative?

Conceptual Framework

Understanding what factors contribute to a student's choice of which college to attend is essential knowledge to gain in order to develop better recruitment strategies in the face of current-day obstacles to entering the field. The Influences on Student College Choice Model was used as the conceptual framework for this study (Chapman, 1981). The longitudinal model specifies the important variables and their interrelationships as a means of guiding both future inquiry and current admissions practices. It suggests that in order to understand a student's choice in enrollment, it is necessary to take into account background and current characteristics of the student, the characteristics of the college/major, and how the interaction of these

characteristics impact the student's perception of the college and thus their intentions to apply. The model was appropriate for this study because it helped to identify the factors the recruiter must take into account in order to develop a recruitment presentation that elicits positive reactions from the targeted audience. Due to limited space, the model will be explained more specifically in the conclusion section.

Purpose and Objectives

The purpose of this case study was to determine junior and community college student's perceptions of a recruitment presentation by a campus representative on the subject of the agricultural education program at the University of Illinois. The research objectives guiding this study are:

1. What are the characteristics of the recruitment visit participants (age, gender, year in school, agriculture background, choice of major, and choice of transfer university)?

2. What are the students' perceptions of recruitment visits by a campus representative as opposed to other recruitment methods such as viewing a university's website, pamphlets, mailings, or campus visits?

3. What are the students' opinions of the Agricultural Education Program at the University of Illinois before and after the presentation?

4. What is the likelihood of applying to the Agricultural Education Program at the University of Illinois before and after the presentation?

Methods

As part of this study, a representative for the Agricultural Education Program at the University of Illinois created a presentation based on addressing the factors in the Influences on Student College Choice Model (Chapman, 1981). The presentation included matching students' educational and career aspirations to the mission of the program; stressing the strong relationships between faculty and students; dispelling misconceptions about cost, location, and accessibility; and providing multiple forms of communication about the program.

Five two-year institutions in Illinois responded to the invitation to have a recruitment visit, representing all but one region in the state. This population was chosen because previous research has shown that students with experience in agriculture and those who participate in agriculture classes are more likely to choose a major in agriculture (Wildman & Torres, 2001). Their enrollment in post-secondary agricultural classes, spoke to their previous experiences and desire to study agriculture. The classes visited included a crop sciences class, a horticulture class, an agricultural mechanics class, and three agricultural education classes.

Students were administered a questionnaire before and after the 20-minute interactive recruitment presentation. The pre-presentation questionnaire consisted of a personal

characteristics section, an open-ended section on perceptions of the agricultural education program, and two sections that used a 5-point Likert-type scale from *not at all* to *very* on the likelihood of applying to the program as well as the influences in the decision to apply to a particular program. The post-presentation questionnaire removed the characteristics section. Face and content validity was addressed using a panel of experts consisting of content and instrumentation specialists, a recruitment representative, and a graduate student who attended community college. Reliability was measured using test-retest, with a percent agreement of 95% or better. Of the 82 students in attendance, 78 returned the completed questionnaires for an acceptable response rate of 95% (Lindner, Murphy, & Briers, 2001). Due to space limitations, open-ended responses were condensed into similar themes and nominal data reported as frequencies only.

Findings

The results of the study were divided into three sections: 1) characteristics profile of responders; 2) students' responses to questions prior to presentation; and 3) students' responses to questions following the presentation.

The majority of the respondents were under the age of 21 years old ($n = 64$), male ($n = 48$), and in their first year of college ($n = 47$). Sixty-three students responded that they had come from a family involved in agriculture and 57 responded that they had already chosen a college major. Fifty-one reported majors in agriculture, with 12 reporting agricultural education as their intended major. Of the 34 who reported selecting a transfer university, only 4 reported they had chosen the University of Illinois. Finally, 34 students responded that visits by a campus representative influenced their decision to apply to a particular college program, while 32 responded that the college or university's website had an influence on their decision. Pamphlets were reported as being neither influential nor not influential.

Prior to the presentation, 20 students responded that they had a perception of the agricultural education program at the University of Illinois. Examples of the six unique themes for positive perceptions were that the program's graduates seemed very prepared to teach agriculture and the program's curriculum was very good. Examples of the nine unique themes for negative perceptions were that the institution was too expensive; current students thought too highly of themselves; and the location was to far from home. Regarding the likelihood of students applying to the program, 23 responded that they were highly unlikely to apply.

After the presentation, 51 students responded that visits by a campus representative were influential in their decision to apply to a particular college program. Regarding the students' responses to if they had a change in their perceptions about the agricultural education program, again 51 students responded that they did have a change. Some of the 31 unique statements about changes in their perceptions included the affordability of the institution, classes in the major are smaller, more informed about the program and the opportunities available at the institution and agricultural education field, and increased likelihood of applying to the program. Finally, 28 participants responded that they were undecided whether to apply to the program, which indicated a shift in intentions before the presentation.

Conclusions

The findings of this case study are limited to the participants and can only be used to add to the body of knowledge on recruitment into agricultural education. Similarly, the recommendations are based on this group and should be further evaluated in future studies. Based on the data collected, it is concluded that there was an increase in the students' likelihood of applying to the agricultural education program as well as an increase in the students' ratings on whether campus visits influence their decision to apply to a particular college or program. The findings did support the framework, which suggests that college students' choices can be influenced by addressing specific student characteristics and external influences. According to the framework, the student characteristics that are most impactful are SES, aptitude, level of degree aspiration, and academic performance. Consequently, the respondents reported before the presentation that reasons why they would not consider the agricultural education program was because it was expensive and they didn't believe they could keep up with the curriculum. However, after the presentation, which addressed some of these negative perceptions, the sample reported positive changes in their perceptions. Based on these findings it is recommended that when making recruitment visits, one must focus on debunking the common misconceptions about the program as it relates to the students personal characteristics. This means that campus representatives must know the characteristics and concerns of the audience before they visit. This could be done by collecting a pre-visit assessment or gathering data from the educators that work with the students. These visits serve as an opportunity to personalize the process and make real connections with the potential students (Chimes & Gordon, 2008).

The majority of students in this study came from an agricultural background in rural areas, which can be identified as one of the external influences on the student's choice. The model outlines various external influences on the student's college choice such as the influence of significant persons like friends, parents, and high school personnel. The findings indicate that having a significant person in the student's life that is involved in agriculture can be influential in their choice of a major. Similarly, the value placed on certain programs by significant persons may have an impact on how that program is perceived (Vincent, Ball, & Anderson, 2009). Several students indicated that their perceptions of the program and likelihood to apply were based on what they heard from others versus personal experiences; thus, it is imperative that recruitment efforts not only target the student, but also key individuals in the community. An effective way of doing this is by having a consistent program representative from the campus visiting the targeted communities.

Another external influence is the fixed college characteristics like the cost, amount of financial aid available, the location, and the availability of the program. Based on the personal characteristics data collected, it was noted that the location of the two-year institution in relation to the university made a difference in the number of students that were willing to transfer if other options were available. In Illinois, there are four institutions that offer an agricultural education program. In addition, there are out-of-state institutions surrounding Illinois that offer in-state tuition or scholarships to agricultural education majors that are closer in distance to the students than the University of Illinois. Accessibility to home is important for students in this study; therefore, it is important that campus representatives point out key advantages of a program that is farther from home that will mitigate the perceived disadvantage of distance when other viable options exists (Donnermeyer & Kreps, 1994; Wildman & Torres, 2001). It is also recommended

that recruitment visits be made early in students' high school careers and contact maintained until the decision to enroll in a four-year institution is made in order to increase the amount of contact the students have with the representatives from the institution as well as the relationship the student has with the program.

The final external influence was college effort to communicate with the student. It was determined that recruitment visits and viewing a university's website are perceived as beneficial for providing information that influenced the students' decisions to apply to particular college programs. However, there was a 21% increase after the presentation in the number of participants who reported a visit by a campus representative could have a major influence on their decision. This is likely because the recruiter was able to answer specific questions about the program and therefore the visit was perceived to be more beneficial to the student. This finding suggests that recruitment visits may be a viable tool for reaching potential students if the visit addresses the specific needs of the students. It is recommended that agricultural education programs take into account the model presented when planning recruitment visits. Things that can be included in the presentation are how the mission of the program matches the educational and career aspirations od the student, highlighting the relationship between the program's faculty and the students enrolled in the major, dispelling local misconceptions about the program. In addition, agricultural education programs should provide multiple forms of communication about the program that are both assessable, easy to glean information from, and address individual concerns. Websites, social media pages, and individually targeted correspondence such as letters and emails are examples of effective forms of communication. Finally further research should be conducted to assess the effectiveness of the aforementioned presentations on students' intentions to apply to a program as well as if they actual enroll.

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Supervision of Agricultural Educators in Secondary Schools: What Do Teachers Want From Their Principals?

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Introduction

The current educational environment in the United States is being "permeated with new calls for accountability at the student, teacher, and school levels" (Stronge, Ward, Tucker, & Hindman, 2007, p. 179). Administrators responsible for the supervision of classroom teachers have felt pressures to increase student achievement at levels consistent with state and national mandates (Danielson & McGreal, 2000). One strategy used by administrators to help teachers to increase student achievement is through the supervision of instruction in traditional classroom settings (Andrews, Basom, & Basom, 1991).

Etling (1993) posited that each component of the agricultural education program "provides powerful learning opportunities" (p. 74) and that the most effective teachers are those who are able to facilitate learning in both formal and nonformal settings such as FFA and SAE. No known studies have been conducted that consider the agricultural education teachers' perceptions of instructional supervision of teachers in the nonformal components of the agricultural education program.

Priority 4 of the National Research Agenda (Doerfert, 2011) calls for research to "deepen our understanding of effective teaching and learning processes in all agricultural education environments" (p. 9). The instructional supervision process directly engages teaching and learning. Since the agricultural education delivery model is unique, the following questions have been posed: How important are instructional supervisory practices to agricultural education teachers in the nonformal components of their programs? Is there a difference between the perceptions of male and female teachers?

Theoretical Framework

This study originated from the work of Ferguson and Bargh (2004) regarding how social perception can automatically influence behavior. Ferguson and Bargh (2004) concluded that social knowledge, activated through perception, can shape and guide complex human behaviors automatically without one's knowledge of how or why these behaviors are taking place. Dijksterhuis and Bargh (2001) and Prinz (1997) wrote that there is a natural connection between perception and behavior. Bargh (1990) explained that goals and behavior responses correspond to mental representations similar to attitudes and perceptual interpretations. This connection triggers the automaticity between perception and behavior.

Agricultural education teachers' perceptions of supervision may impact behavior relative to how they respond to instructional supervision by their school principal as well as how they approach their professional practice.

Purpose/Objectives

The purpose of this descriptive study was to identify agricultural education teachers' perceptions regarding the importance of selected instructional supervisory practices used in the nonformal components of the agricultural education program with consideration given to gender differences.

Methods/Procedures

This descriptive, base-line study was a cross-sectional survey design implemented through an internet-based survey using the tailored design method (Dillman, Smyth, & Christian, 2009). Survey items were developed after a review of the literature regarding the supervisory practices of high school principals (Blase & Blase, 2004; Zepeda & Ponticell, 1998). Items were grouped within the following constructs of instructional supervision practices as identified by Zepeda and Ponticell (1998): validation, empowerment, coaching, visible presence and professionalism. A panel of experts reviewed the instrument for content, face, and construct validity and provided feedback. Reliability estimates were determined for each construct and had acceptable or good Cronbach's Alphas ($\alpha = .75-.89$) (George & Mallery, 2003).

A pilot study was conducted using the recommendations of Sudman (1976). Feedback was used to improve the clarity of the 28 instructional supervisory practices.

The target population for this study consisted of high school agricultural education teachers in the United States who were identified in available, electronic state agricultural education instructor directories. A convenience sample of agricultural education teachers (N=3226) was drawn from 17 states. States were stratified by the size of their FFA membership (National FFA Organization, 2010) and a disproportionate stratified random sampling technique was used (Ary, Jacobs, & Sorenson, 2010). A random selection of participants was then drawn from each state. A total of 234 respondents provided a 32.52 percent response rate.

A comparison between early and late respondents was used to control for non-response error as a threat to the external validity. An independent samples t-test (level of significance, $\alpha = .05$) determined that there were no statistically significant differences between early and late respondents (Ary et al., 2010). Results from this study should not be interpreted to be applicable beyond the sample frame.

Results/Findings

The average agricultural education teacher in this study was male, age 40.62 years, with a Bachelor's degree and 14.87 years of teaching experience.

Frequencies and percentages were calculated for each of the 28 supervisory practices. The frequencies, percentages, grand means and standard deviations were calculated for each construct. Table 1 identifies the empowerment construct.

Table 1

Frequency of Responses for the Importance of Empowerment Supervisory Practices in Nonformal Settings

	n	Not Important f(%)	S.what Important f(%)	Mod. Important f(%)	Very Important f(%)	Ext. Important f(%)
My supervisor…						
elicits my opinion about how to improve my teaching in nonformal settings	234	16(6.8)	57(24.4)	70(29.9)	**76(32.5)**	15(6.4)
encourages me to try new teaching strategies in nonformal settings	233	22(9.4)	57(24.5)	**76(32.6)**	66(28.3)	12(5.2)
helps me increase awareness of my own teaching practice in nonformal settings	234	21(9.0)	58(24.8)	**81(34.6)**	64(27.4)	10(4.3)
is supportive of me trying new teaching strategies in the nonformal settings of my program	234	8(3.4)	40(17.1)	68(29.1)	**81(34.6)**	37(15.8)
recognizes my individual teaching efforts in the nonformal settings of agricultural education	233	6(2.6)	33(14.2)	71(30.5)	**95(40.8)**	28(12.0)
supports and facilitates my work in nonformal settings	234	9(3.8)	24(10.3)	41(17.5)	**103(44.0)**	57(24.4)
Construct Grand Mean (*SD*)		3.3(.79)				

Note. Mode in **boldface.**

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Table 2 identifies the frequencies, percentages, grand means and standard deviations for the visible presence construct.

Table 2

Frequency of Responses for the Importance of Visible Presence Supervisory Practices in Nonformal Settings

	n	Not Important *f*(%)	S.what Important *f*(%)	Mod. Important *f*(%)	Very Important *f*(%)	Ext. Important *f*(%)
My supervisor…						
attends FFA meetings for the purpose of supervision	231	**76(32.9)**	58(25.1)	56(24.2)	32(13.9)	9(3.9)
attends SAE visitations for the purpose of supervision	231	**81(35.1)**	68(29.4)	47(20.3)	26(11.3)	9(3.9)
observes me in a variety of educational settings	234	7(3.0)	27(11.5)	61(26.1)	**100(42.7)**	39(16.7)
provides feedback regarding how I relate with students in nonformal settings	233	10(4.3)	36(15.5)	65(27.9)	**100(42.9)**	22(9.4)
understands my role as a teacher in nonformal settings	234	5(2.1)	16(6.8)	38(16.2)	**107(45.7)**	68(29.1)
Construct Grand Mean (*SD*)		3.1(.76)				

Note. Mode in **boldface.**

Table 3

Statistically Significant (p=.05) Chi Square Results for Gender and Importance of Selected Administrator Supervisory Practices

Item	DF	N	χ^2	V^a	P
Coaching					
models questioning strategies to use in nonformal settings	2	234	8.45	.19	.015
works with me to improve my teaching in nonformal settings	2	234	6.46	.17	.040
Empowerment					
encourages me to try new teaching strategies in nonformal settings	2	234	9.34	.20	.009
helps me increase awareness of my own teaching practice in nonformal settings.	2	234	7.63	.18	.022
recognizes my individual teaching efforts in the nonformal settings of agricultural education	2	234	9.25	.20	.010
Professionalism					
delineates between instructional supervision for improvement and evaluation	2	232	6.42	.17	.040
provides me with resources and time to improve my educational practice in nonformal settings	2	233	9.75	.21	.008
Validation					
gives me descriptive, constructive criticism regarding my teaching in nonformal settings	2	234	12.37	.23	.002
gives me feedback and suggestions in working with students in nonformal settings	2	234	13.58	.24	.001
is available for discussion and providing feedback about my teaching in nonformal settings	2	234	6.60	.17	.037
Visible Presence					
provides feedback regarding how I relate with students in nonformal settings	2	233	7.96	.19	.019

Note. [a]Cramer's V.

Distribution among groups was examined based on demographic characteristics through Chi Square analysis. Since multiple cells had expected cell counts less than five, researchers collapsed the Likert items into three categories as follows: not important and somewhat important = 1, moderately important = 2, very important and extremely important = 3. Table 3 identifies the items with statistically significant outcomes regarding gender. A Cramer's V analysis found five statements that indicated a moderate level of association: provide feedback and suggestions (.24); give descriptive, constructive criticism (.23); provide resources and time (.21); encouragement and supporting new teaching strategies (.20); and recognition of their individual teaching efforts (.20).

Discussion

Respondents rated all constructs as moderately important with empowerment as the most important (GM = 3.3) followed by validation (GM = 3.2), coaching (GM = 3.1), professionalism (GM = 3.1) and visible presence (GM = 3.1).

When considering the empowerment construct, teachers felt that it was very/extremely important that their supervisor help them to increase awareness of their own teaching while providing encouragement and recognition. Zepeda and Ponticell (1998) espoused that teachers are empowered when supervision allows and encourages teachers to try new things.

Respondents from the present study felt it was very/extremely important that the principal understand their role as a teacher in nonformal settings. This can be done through a visible presence of the school principal. To better understand the teacher, respondents felt principals should provide feedback from a variety of educational settings. Moore and Camp (1979) found administrators do not always understand the various roles of the agricultural education teacher.

Although empowerment was considered moderately important, respondents perceived *attending FFA meetings and SAE visits for the purpose of supervision of instruction* as only somewhat important. Conversely, Cepica (1979) reported that Oklahoma agricultural education teachers and administrators agreed when they ranked *working with FFA activities* third on a list of ten items to be completed during the summer contract. Additionally, Thompson (1986) recommended that agricultural education teachers should involve administrators in FFA activities.

A*ttending SAE visitations for the purpose of supervision* was rated even less important. This conflicts with a perception study of Tennessee agricultural education teachers who rated the statement *school administrators should be supportive of time off during the school day for teachers to make supervisory visits* at 3.16 on a 4.00 Likert-type scale (Swortzel, 1996). High school principals' perception of 'time off' may conjure up an image of non-engagement in educational endeavors. Agricultural education teachers should communicate to their principals the importance of deep educational engagement that takes place during SAE supervisory visits. Rush and Foster (1984) recommended improving SAE by having administrators and agricultural education teachers work together to evaluate its effectiveness.

Female teachers perceive the instructional supervision process as being more important than their male counterparts. These findings support the notion that males and females communicate with different purposes. Murphy and Zorn (1996) contended that women communicate to connect with people while men communicate to solve problems. Each of the selected supervisor practices identified demonstrates a need for females to develop a relationship with their supervisor.

Conclusions/ Implications/Recommendations

Agricultural education teachers perceive that it is important for their high school principals to understand the teacher's role in the nonformal components of the agricultural education program. Instructional supervision is complex, transcending the traditional classroom setting to all components within the agricultural education program. Since perceptions regarding instructional supervision can impact behavior (Ferguson & Bargh, 2004), agricultural education teachers should be proactive and engage their supervisors in a holistic approach to supervision. Agricultural education teachers should invite their high school principals to supervise them in all aspects of their teaching, especially within the program components of SAE and FFA.

Additional research is needed regarding teachers' perceptions of instructional supervision (Zepeda & Ponticell, 1998) to determine how often agricultural education teachers experience the instructional practices they deem important. Further exploration of instructional supervision could help to develop a list of appropriate supervisory strategies that can positively impact student achievement through instructional supervision in all areas of career and technical education.

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Integrating Extension and Research Activities: An Exploratory Study

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Introduction and Conceptual Framework

Increased emphasis is being placed on the need for common understanding, expectation, and project language among research and extension activities. Research and extension faculty currently hold partly similar and partly dissimilar views about integration efforts.

Over the past two decades, U.S. extension and research systems have attempted to work together. However, these two entities remain and maintain separate cultural and organizational identities with varied, but linked missions (Bennett, 2000). Further, the need for accountability and documenting evidence of program impact continues to increase.

The rationale for integrating research, extension, and education is to have a common language to plan, discuss, implement and demonstrate program performance and accountability. In addition, it is believed that integration efforts will help 1) market extension programs and research activities to the general public, 2) show how the investment made in research and extension activities are benefiting federal, state and local programs and activities, and 3) provide a mechanism to effectively communicate and influence key stakeholders, and thereby help them to better understand and appreciate research and extension activities of land-grant universities.

The concept of integrating extension and research dates back to the enactments of Morrill (1862) and Smith-Lever (1914) Acts. The rationale for this integration was that new research conducted in labs and other facilities at land-grant universities be transferred into practice via Cooperative Extension. Further, problems faced by farmers and the general public relative to a new technology or practice is conveyed to the researchers and laboratories so that corrections are made to the new technologies. As years passed, the integration efforts of extension and research has been questioned by faculty, researchers, program leaders, administrators, planners, and government, at both federal and state levels.

Warner, Hinrichs, Schneyer and Joyce (1998) examined challenges and limitations to involving Extension educators and researchers in research projects designed to test theory. According to Warner, et al, collaborations between researchers and Extension educators have traditionally been viewed as a division of labor which distances Extension agents from the research process and the researchers from Extension practice (p.4). They identified several challenges to Extension-research collaboration which include: 1) research design and methodology, 2) Extension practice 3) organizational style and culture.

Gorsuch (1999), a professor at Clemson University with over 25 years of experience alluded to the philosophy of Extension-research linkages by stating that they are supposed to be coordinated. Why, then there are no common codes for reporting in CRIS. He stated, "the public looks at the end result, not at whether research or Extension was the group that did it." We must ask ourselves the question, what is the value of our (Extension-research) efforts to public good? Answers to this question will help position ourselves to address accountability issues and stakeholder engagement.

According to Daniel Decker, the Director of Cornell University Agricultural Experiment Station, the traditional model of Extension-research was simple and worked somewhat well. He called for a more "transactional" approach to Extension-research integration where engagement of researcher, educator, and stakeholders is meaningful and continuous. Key elements of the "transactional" approach include: 1) educational needs, and related new information required, are identified by engaging stakeholders, extension educators and researchers through dialogue and collaboration, 2) verification of the research agenda and priorities by Extension engaging stakeholders, extension educators and researchers, 3) extension educators and researchers work together during the research process, especially at local field sites, 4) researchers, working collaboratively with extension educators, identify and provide opportunities to share the purposes and progress of the research with the broad community of relevant stakeholders, and 5) research findings are integrated with existing knowledge and shared in meaningful terms with stakeholders who can put this knowledge to work.

Bruns (2005) of the Ohio State University, as cited in Rennekamp, Cummings, Feaster, Ladewig, Lambur, Newman, Price, Richard and Warner (n.d.) suggested the need for blending of all work that is being carried out so that all can learn from each other. She asked the question, we not do this (blending), then how are others going to be able to validate our work?

Several questions must be addressed to develop strategies for effective joint extension-research activities: 1) How can research and extension faculty work collaboratively to develop, implement, and evaluate projects/programs? 2) Do they share common views of what a project/program entails? 3) What mechanisms currently exist to encourage and support integration efforts? 4) What are the barriers that limit integration efforts both on campus and in the field and what strategies they believe are good for effective integration?

Purpose and Objectives

The overall purpose of this study was to assess the current status of joint Extension-research activities. Objectives of the project include:

1) Ascertain the views of Extension and research faculty regarding integration activities

2) Identify facilitating factors and inhibiting barriers to joint extension-research-activities,

3) Develop a framework for integrating research, Extension, and teaching activities

Methods and Procedures

Upon approval by the Institutional Review Board (IRB) for human subjects, potential study participants were identified from the College of Agricultural Sciences (CAS) at The [State] University and included faculty with 50% or greater appointments in Research or Extension, respectively. Department heads/unit leaders in the CAS provided faculty contact information in the form of email addresses, and a purposive sample of faculty possessing the aforementioned appointment criteria were contacted and asked to participate in focus group interviews.

To further investigate integration strategies and elicit responses to the aforementioned questions, a qualitative research approach (Creswell, 2011; and Krueger, 1994) was utilized.

Two focus group interviews were conducted: one including a sample (n = 8) of Research faculty and one containing a sample (n = 9) of Extension faculty members. Participants were provided a brief introduction and background for the study, and subsequently asked to respond to a series of nine predetermined interview questions. A nine-question interview protocol was developed and comprised of open-ended question items that emphasized the purpose of the study. The protocol was flexible in design to allow for deeper, probing questions. Probes were used to deepen the response to questions, increase the richness and depth of responses, and provide cues to the interviewee about the level of responses desired (Patton, 1997).

The Survey Research Center (SRC) at The Pennsylvania State University was utilized for assistance in conducting the focus group interviews. Representatives from the SRC served as facilitators for the interview sessions in order to eliminate bias and increase interview efficiency. Focus group interviews were audio recorded and transcribed, with transcriptions serving as the primary data source. To analyze the transcribed interviews, data was coded and assigned themes. Further, member checking was utilized to confirm the findings and themes that emerged out of transcribed data.

Findings

When the transcribed interviews were analyzed, several themes emerged. The themes and a brief discussion of the themes are provided below.

1) faculty have different views on integrating extension and research,

2) many barriers exist to integration, and

3) need for understanding of faculty roles in collaborative activities

4) there are benefits to integration

5) faculty want to collaborate

When asked about their views regarding Extension and research integration activities, participants in both groups agreed that collaborative efforts were occurring throughout many disciplines, but changes were necessary to promote future endeavors. Additional time and funding, as well as incentives and enhanced structural support for integrative projects were addressed by both groups. Both groups agreed they spend much of their time on searching for funding.

Several barriers to effective collaborative efforts were noted in both focus groups. Administration-related communication challenges, a lack of time and funding to devote to projects, and the need for clarification regarding respective roles of Extension and research collaborators were described as inhibiting barriers to current integrative activities.

Funding, organizational culture, recognition, lack of time, and lack of administrative support were viewed as barriers. Increased funding and collaboration with other faculty, better communication with administrators, and joint appointments were identified as facilitating factors.

Extension faculty noted the discipline-dependent levels of integration in projects, expressed feelings of research being more important than Extension at both the university and government levels, and described the need for change within the Extension organizational structure in order to promote integrative strategic planning. Research faculty noted the differences in culture, roles, and priorities between the two entities. Further, they emphasized the need for Extension to address the future and adapt to modern times, and described the diminishing number of Extension experts who are available to translate research to the public. On the other hand, Extension faculty felt that their accomplishments were not highly valued in career tracks at university level.

Participants in both focus groups stated that supportive mechanisms for integrated Extension-research projects existed in higher prevalence outside the bounds of the university. Research group participants described Multi-state integration projects, SEED Grants, and federal grants with collaborative components, and provided the overall recommendation that additional mechanisms be instated in order to encourage future efforts. Finally, participants from both groups identified strategies for effective integration by outlining the importance of networking through conferences and seminars, working together in departmental unit teams, utilizing joint appointments, conducting field research, and serving on graduate student committees.

Regarding evaluation and accountability mandates, both groups agreed that evaluation activities. However, both research and Extension faculty viewed that monitoring and evaluation are important skills in applied research, and Extension faculty are better equipped to perform such activities. Research faculty felt that Extension's rigid requirements for documentation of activities can limit time and opportunities to collaborate. Extension faculty are skilled at evaluation and reporting.

Based on the findings of the study, we propose two-pronged framework—one specifically for Extension and research integration and another for the entire land-grant system. As shown in Figures 1 and 2, integration must occur in all land-grant functions. First, integration must occur between Extension and research. This is a first requirement to make any dent in integration efforts. The Extension and research administration should emphasize the importance of integration and collaboration. Integration should occur at the departmental, college, and university levels in order to address critical issues facing society. In addition, three key elements—relevance, capacity, and impact should be considered. Relevance involves addressing critical issues (needs) facing society. Capacity refers to the knowledge, skills, and resources needed to address critical issues. And finally, impact asks the question, "did we make a difference?" Collaborative efforts among teaching and research faculty, and Extension faculty and educators must occur to fulfill the land-grant mission and philosophy.
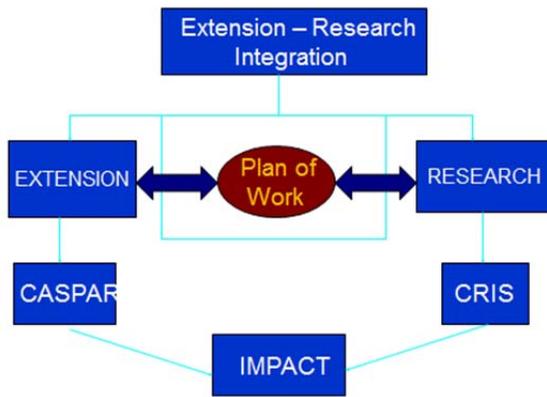
Figure 1: Framework for Extension-*Research*
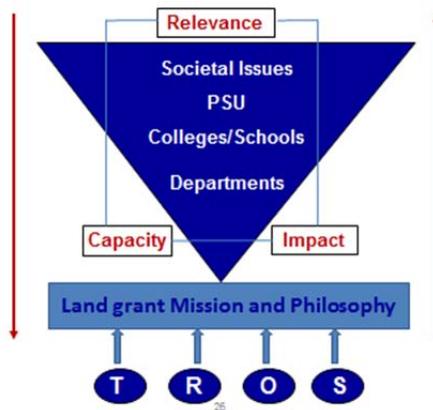
Figure 2: Framework for Integrating LG

Conclusions and Implications

As indicated in the title of the study, this is an exploratory study. Results from focus groups have provided the groundwork to develop and design a survey to address the relevance, capacity, and impact of joint research-extension efforts. In addition to results from focus groups and interviews, survey results will provide a broader perspective to continuously design, implement, and evaluate extension-research integration efforts. Currently, we are working on crafting a survey using the above themes to collect data from the stakeholders.

This study can be useful in determining the worth of Extension-research integration efforts. A strong research-Extension linkage will help in broader understanding of past and future benefits of the research and extension efforts to the public good. In addition, this linkage may also help to address issues of stakeholder involvement and accountability concerns.

Within the university systems, Extension-research integration will provide better clarity to all stakeholders in clearly describing and articulating the benefits of such efforts. Further, Extension-research integration will help develop better institutional mechanisms for connecting innovations in research and new knowledge developed to a diverse public who are the consumers of that knowledge.

Extension-research facilitates the integration of a deep understanding of science and technology (through research) with practical knowledge, a hands-on orientation (through Extension), and experimental skills and insights (Extension-research integration).

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Effectiveness of 4-H Program as Perceived by Parents of 4-H Participants

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Introduction and Theoretical Framework

4-H is one of the leading youth organizations across United States and Canada. 4-H is the most highly recognized of all Cooperative Extension programs. For over 110 years, 4-H has been helping young people ages 5-19, reach their fullest potential through learning new life skills, meeting new people, learning responsibility and building self-confidence. Participation in 4-H fosters knowledge acquisition, leadership and personal development, and citizenship through projects, activities, and programs (Penn State 4-H program).

Theoretical underpinnings for this study came from studies of Blyth (2000), Eccles & Appleton-Gootman (2002), Singletary, Smith, & Evans (2006), Boleman, Cummings, & Briers (2004). Blyth identified six outcomes (6 Cs) of successful youth development programs which included: Confidence, Competence, Caring, Connection, Contributing and Character. 4-H volunteer leaders provide opportunities for youth and teach skills relative to these 6 Cs to promote positive youth development (Singletary, Smith, & Evans, 2006; Walker, 2003; Yohalem, 2003). Critical precursors for positive youth development (PYD) were developed by Eccles & Appleton-Gootman (2002). These included: 1) support for efficacy and mattering, 2) physical and psychological safety, 3) opportunities for skill building, 4) appropriate structure, 5) positive social norms, 6) opportunities to belong, and 7) supportive relationships.

Singletary, Smith and Evans (2006) in their study in Nevada found that 4-H volunteers provide opportunities and teach skills relative to these 6 Cs to promote positive youth development. Two of the seven precursors (physical and psychological safety and efficacy and mattering) of PYD explained 17% of the variance in skills that youth learn in 4-H.

The success of the 4-H program experience depends greatly upon parental participation and their direct involvement with their kids in 4-H program activities. Previous studies have reported parents' positive perceptions of their children's involvement in 4-H and the contributions they make to the program and to their children (Gregoire, 2004; Ferrari, Hogue, & Scheer, 2004; Gill, Ewing, & Bruce, 2010; Singletary, Smith, & Evans, 2006). Consensus from these studies suggests that parents are a vital part of the 4-H program and they help ensure the best growth experience possible for their child, help their kids with 4-H projects and strengthen their social networks with other parents and youth in the community.

Purpose and Objectives

The overall purpose of this study was to assess the effectiveness of [state] 4-H program as perceived by parents of 4-H participants. The following objectives guided the study:

1. Describe the demographic profile of parents of 4-H participants;
2. Determine effectiveness of 4-H program as perceived by parents of 4-H participants;
3. Determine parents' perceptions of what their children are learning in 4-H programs; and
4. Assess parents' skill levels that could be used in 4-H program.

Methods and Procedures

Population and Sample

This study employed a descriptive-correlational research design with a mail survey. The population for the study consisted of all parents in the Pennsylvania 4-H program (N=22,643). The frame for the study was obtained from the list maintained in the Extension director's office. A random sample of 368 parents was selected. This sample size reflects a 5% sampling error.

Instrumentation, Data Collection and Analysis

A four-section instrument suitable for a mail survey was developed to collect data. This instrument was developed based on a study by Singletary, Smith, and Evans, 2006. Section one contained 15 statements relative to the effectiveness of 4-H program as perceived by parents of 4-H participants. The 15 statements were measured on a five-point Likert scale that ranged from 1=*Very ineffective* to 5=*Very effective*. Section two contained 15 statements relative to life skills youth learned in 4-H, measured on five-point Likert scale (1=*very little* to 5= *very much* with a don't know option). Section three of the instrument contained 15 statements relative to parental skills that could be used in 4-H, measured on five-point scale ranging from 1= *I need a lot of improvement at this* to 5 = *I am very good at this*. These 15 statements were further grouped into subscales (safety, relationship, belonging, skill, structure and mattering) to reflect the precursors of PYD (Eccles & Appleton-Gootman, 2002; Singletary, Smith, & Evans, 2006). The final section of the instrument elicited demographic information such as gender, residence, education, age, and other program characteristics.

The instrument was validated for content and face validity by a panel of experts consisting of 4-H faculty and staff, program leaders, Extension educators and a graduate student. A post-hoc reliability analysis was conducted to estimate the reliability of the instrument. Cronbach's alpha for sections one, two, and three of the instrument were found to be acceptable and in similar range to those reported by Singletary, Smith, and Evans (2006). Reliability coefficients (alpha) for the precursors of PYD (parental skills) ranged from a low of .84 (relationship) to a high of .91 (skill). Similarly, the reliability coefficients for 4-H effectiveness section (15 items) and youth life skill section (15 items) were very good (Cronbach's alpha=.87 and .94 respectively).

Dillman's total design method was used to collect data for the study (Dillman, 2000). An initial pre-notification card was sent to all 368 parents, followed by an instrument, and another copy of the instrument to those who did not respond to the initial mailing. After two follow-ups and a post card, a total of 152 parents responded for a return rate of 41%. Non-response bias

was addressed by comparing early, late and non-respondents as per procedures suggested by Miller and Smith (1983). No significant differences were found among the three groups on the items in sections one, two, and three of the instrument. Data were analyzed using descriptive statistics. Step-wise regression was used to identify parents' perspectives on life skills youth learn in 4-H.

Findings

Objective One – Demographic Profile

Eighty percent of the parents were female. Twenty-five percent had a bachelor's degree, 30% had completed some college, while another 30% had completed high school. Over 65% of the parents were in the age group of 41 to 50 years, 21% under 40 years and 12% in the age group of 51-60 years. Forty-one percent were 4-H members when they were young. Approximately 55% of the parents resided in rural areas, 25% lived on the farm, and the remaining 20% lived in towns, cities and suburbs.

Objective Two – 4-H Program Effectiveness

Parents perceived that the 4-H program was most effective in: providing a safe place for learning and growing (M=4.44, SD=0.64), making a positive influence in my family's life (M=4.33), using 4-H competitive events as teaching tools for their children (M=4.28, SD=0.72), using the county newsletter as a way to learn about 4-H and events (M=4.26)), fulfilling a variety of subject matter interests (M=4.23, SD= 0.58)), and involving youth in the community (M=4.07, SD=0.89). The lowest score was for the statement, attracting children from diverse cultural and ethnic backgrounds with a mean value of 3.45.

Objective Three – Parents Perceptions of what their Children are Learning in 4-H

Parents were asked to indicate the extent to which their children are learning life skills in 4-H. Ratings generally ranged from "much" to "very much". Life skills receiving the highest ratings were: learning about their 4-H projects (M=4.33, SD=0.63), achieving greater self-confidence around others (M=4.25, SD=0.71), acquiring greater self-esteem (M=4.20, SD=0.73), learning self-responsibility (M=4.20, SD=0.73), setting and reaching goals (M=4.17, SD=0.73), and communication skills (M=4.15, SD=0.81). The statement, skills useful in dealing with conflicts was perceived as "neutral" (M=3.45, SD=0.90) by parents.

Objective Three – Self-perceived Parent Skills

Parents perceived themselves as "good to very good" in teaching competencies relative to "supportive relationships" (mean scores ranged from 3.57 to 3.93), followed by "belonging" (mean scores ranged from 3.90 to 3.93), "safety" (mean scores ranged from 3.60 to 3.77), "providing appropriate structure" (3.54), "opportunities for skill development" (3.61), and mattering (3.72).

Objective Four - Contribution of Perceived Parents' Skills on Life Skills Youth Learn in 4-H

A stepwise regression analysis was conducted to determine the contribution of perceived parents' skills on the life skills youth learn in 4-H program. The dependent variable (15 item youth life skills) were regressed on the independent variables (15 item parent skills grouped into six subscales). Significant positive relationships existed between all six perceived parents skills and life skills youth learn in 4-H. Relationships were highest for: skill (r=.517), belonging (r=.393), and mattering (r=.360), followed by structure (r=.370), safety (r=.349), and relationship (r=.316). Although significant, positive correlations existed between the seven variables, none of the intercorrelations were high (r= >.70) and as such multicollinearity was not a problem.

The first variable to enter the regression equation was *skills* (B=.428, t (140) = 45.114, p <.001) followed by *belonging* (B=.170, t (139) = 2.032, p <.05). These two variables explained 28.8% of the total variance (adjusted R=.278) in youth life skills.

Conclusions and Recommendations

Overall, parents perceived that the 4-H program is effective in 1) providing a safe place for their kids to learn and grow, 2) offering a variety of subject matter interests that helps youth to learn valuable life skills, and 3) making a positive influence on their family life. However, parents perceived that [state] program was somewhat ineffective in 1) attracting diverse children from various ethnic backgrounds and 2) marketing and advertising of 4-H programs. These findings mirror the findings achieved by Singletary, Smith and Evans (2006) study of parents in Nevada.

Parents perceived that their kids learned valuable skills by participating in 4-H programs: skills learned by participating in 4-H projects, self- confidence, self-esteem, communications skills, and relationship building skills.

Parents also perceived that they are "ok to good" in teaching life skills to youth. The areas where they indicated that they were good include: helping youth to feel important, listening to youth, understanding youth's point of view, keeping youth from hurting each other, and encouraging youth to take leadership roles. However, parents perceived that they were "okay" or need help to teach skills to youth relative to relationship building, conflict management, and social and decision making skills.

Significant relationships existed between six parental skills and life skills youth learn in 4-H. Relationships were highest for: skills, belonging, mattering and structure. Regression analysis revealed that two skills—skills and belonging explained 28.8% of the variance in youth life skills. This suggests that when parents make youth feel welcome and important to the 4-H program, and demonstrate importance of life skills, then youth learn life skills relative to communications, decision making, goal setting and relationship building. Parents of 4-H participants in [state] are competent in teaching life skills to youth. 4-H program in [state] could use parents as resources when conducting 4-H program activities and events. However, a need exists for providing up-to-date training and/or information resources to parents in areas of goal setting, relationship building, communication, and decision making.

Overall, parents say positive things about [state] 4-H. These include effectiveness in achieving a number of goals, teaching children life skills and contributing to positive youth development. In addition, parents themselves feel possessing "GOOD" skills to teach life skills to 4-H.

Parents also think that 4-H should enhance its efforts relative to increase efforts to attract children from diverse, cultural and ethnic backgrounds. This is especially true considering the changing demographics in America. Based on the findings of the study, the following recommendations are offered:

Findings of this study should be shared with parents and kids to make informed decisions about their role and need of training and/or resources to teach youth life skills. As indicated earlier, opportunities for training should be provided in areas that predict youth life skills— relationship building, goal setting, communication, and decision making.

This study should be replicated using Extension educators, volunteer leaders, and youth to identify convergence/divergence in their perceptions of youth life skills. Such a study would help identify critical areas of need for training volunteer leaders, extension educators and parents. In addition, such a study would also help offering common training programs for all three groups, thereby saving time, money and resources.

Periodic review of 4-H projects should be undertaken to determine specific training needs of parents. A matrix of 4-H projects should be developed to identify specific competencies that youth have to learn in these projects. Such a matrix will help identify gaps to provide training for parents and Extension educators.

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How Are We Educating Future Agricultural Leaders? A National Profile of Leadership Capacities and Involvement in College Compared To Non-Agricultural Peers

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Abstract

Given the importance of leadership development within the various agricultural professions, a national sample (n=461) of students with agriculture-related majors from 55 colleges was compared to a similarly-sized random peer group from the same institutions. The data were analyzed to compare the agricultural student sample to their peers with respect to a variety of social identities (e.g. race, gender, political leanings); high school and college involvement and leadership positions held within co-curricular activities and organizations; and scores from several measures of leadership-related outcomes. These outcomes included socially responsible leadership practices, leadership efficacy, social change behaviors, cognitive complexity, and the degree to which students participate in socio-cultural discussions. Findings suggest that while agricultural students display similar levels of involvement and leadership in high school and higher levels in college, they do not make some of the same leadership outcome gains in college as the comparison population. These findings hold important implications for the way agricultural educators structure classroom environments and how they advise student organizations.

Introduction

The training of a "scientific and professional workforce that addresses the challenges of the 21st century (Doerfort, 2011, p. 9) is one of the six key research priorities of the American Association of Agricultural Educators (AAAE). Based upon these six priorities, education programs are to develop the skills and knowledge for all content areas teachers may be expected to teach, including the content area of leadership (Simonsen & Birkenholz, 2010). Powell and Agnew (2007), writing for agricultural educators, emphasized, "leadership is a valued attribute for employers and for society in general, one which is expected of university students upon graduation" (p. 11). To meet this expectation of leadership attributes, students must be engaged in the numerous opportunities available during their collegiate experience. Students who participate in co-curricular opportunities available on campus have a clear advantage over students who choose not to engage in these means of leadership development (Astin, 1999; Foubert & Grainger, 2006; Freeman and Goldin, 2008). Discovering why some students choose not to participate in such beneficial experiences is an area in need of further exploration (Ewing, Bruce, & Ricketts, 2009). Connors, Velez, and Swan (2006) observed there may be a gap in student awareness of leadership development opportunities on campus (formal and informal). Investing in student leadership development at all levels of experience and involvement can positively impact both the current and future roles of these young leaders.

Although collegiate student leadership development tends to be a focus for career preparation, it has been well established that leadership development begins prior to college enrollment (Park & Dyer, 2005; Allen, Ricketts, & Priest, 2007). Several researchers have suggested the positive impact of high school or agricultural organization involvement on leadership development (Allen, Ricketts, & Priest, 2007), so this should be taken into consideration.

Theoretical Framework

The theoretical frame employed within this study is founded upon Astin's Input-Environment-Output (I-E-O) model of student learning (Astin, 1993), in which students enter the college environment with certain personal characteristics and past experiences. While there, they interact with the college environment, and the combination of inputs and the environments lead to certain outcomes. This frame was designed to measure the varying effects of involvement and positional leadership within student organizations, as well as participation in structured leadership trainings, on leadership-related outcomes while adjusting for personal differences and pre-college experiences in students. Within this study, the Social Change Model of Leadership Development (Higher Education Research Institute, 1996) was utilized as the theoretical model of leadership to define preferred leadership outcomes.

Purpose of the Study

The purpose of this study was to explore differences in involvement and leadership capacities between a group of students who identify "agriculture" as their primary major and a comparison group of students who did not identify agriculture as their primary major. Given our theoretical frame, our research questions were:

1. Do agriculture students differ from non-agriculture students with regards to personal characteristics such as race, gender, and political orientation, and if so, to what extent is the difference?

2. Do agriculture students differ from non-agriculture students in the degree of involvement they report in both high school and college involvement and leadership opportunities, and if so, to what extent is the difference?

3. Lastly, do agriculture students differ from non-agriculture students in scores of leadership capacity and efficacy, and in scores of related measures such as cognitive complexity, social change behaviors, and the degree to which they participate in socio-cultural discussion with peers? If there are differences, to what extent?

Methods

Population and Sample

This study used data collected in the spring of 2009 as part of the Multi-Institutional Study of Leadership (MSL), which included a total of 55 colleges and universities (Dugan & Komives, 2010). From these institutions, 155,716 students were invited to participate, and 56,854 completed surveys, for a 37% response rate (Dugan & Komives, 2010). An item on the MSL invited students to identify their "primary major" from a list of 21 options, of which an option was "Agriculture." A total of 461 students (0.5%) selected this option – this collection of students served as the sample of interest within this study. A total of 262 (57%) identified as female, 401 (87%) as Caucasian/White, 7 (2%) as African-American/Black, 14 (3%) as Asian-American or with Asian descent, 13 (3%) as Latino/Hispanic, while 26 (5%) either identified as multi-racial or did not identify. A simple random comparison sample (n=461) was selected from within the population to meet the requirement of homogeneity of variance in outcome variables across both samples. Within the comparison sample, 299 (65%) identified as female, while 341 (74%) identified as Caucasian/White, 26 (5%) as African-American/Black, 35 (8%) as Asian-American/Asian, and 19 (4%) as Latino/Hispanic, while 40 (8%) identified as multi-racial or did not identify. The gender and racial demographics for the comparison group were not statistically different from the overall profile of the national sample.

Instrumentation and Variables

Input and Environmental Variables. Students were asked to report their gender, race, and political orientation (a five-point scale from "very liberal" to "very conservative"). With regard to political orientation, 35% of the group of Agriculture students reported themselves as "conservative" and 11% as "very conservative," compared to 17% and 5%, respectively, within the peer group. Approximately 16% identified as "liberal" and 6% as "very liberal" compared to 32% and 10%, respectively, within the peer group. Approximately 32% of the agriculture students reported themselves as "moderate" compared to 36% of their comparison peers.

Students were also asked to report their remembered level of involvement in and leadership of student groups in high school ("HS Involvement" and "HS Leadership," respectively). Students were then asked to rate their remembered leadership capacities while in high school, using a condensed version of the Socially Responsible Leadership Scale ("SRLS Pre-test"), which will be described later. In addition, students were asked to report the current extent of their involvement in and leadership of student organizations in college. Lastly, students were invited to share the extent of their participation in leadership development training programs while in college ("COL Lead Training"), including both curricular (e.g. a leadership class) and co-curricular (e.g. a retreat or conference).

Outcome Variables. The Socially Responsible Leadership Scale (SRLS) was utilized as the outcome variable measuring leadership capacity within the theoretical frame of the SCM. It has been shown to possess acceptable levels of reliability and validity (Dugan & Komives, 2007; Dugan & Komives, 2010; Slack, 2006). Also included was a scale of Leadership Self-Efficacy (LSE). Scales measuring indirect leadership capacity contained within the MSL included measures of Cognitive Complexity ("CC,"measuring the degree that students report growth in

critical thinking skills), Social Change Behaviors ("SCB,"measuring the degree to which students engage in community-minded change actions), and Socio-Cultural Discussions ("SCD,"measuring the degree to which students engage in discussion with peers around topics of personal and societal differences). A summary of significant variables in this study can be found in Table 1.

Table 1

Variables Examined Within This Study Collected as Part of the Multi-Institutional Study of Leadership

Input Variables	Environmental Variables	Outcome Variables
Gender	COL Involvement	Leadership capacity (SRLS)
Race	COL Leadership	Leadership Self-Efficacy (LSE)
Political orientation	COL Lead Training	Cognitive Complexity (CC)
HS Involvement		Social Change Behaviors (SCB)
HS Leadership		Socio-cultural Discussions (SCD)
SRLS Pre-test		

Results

Means and standard deviations for each scale variable were examined, and are included in Table 2. In general, Agriculture students' scores were higher on measures of involvement compared to the random sample, and were lower on outcome measures of leadership capacity and related competencies.

Table 2

Means and Standard Deviations for Scaled Input, Environmental, and Outcome Variables

Variable	Agriculture Students (n=461)		Comparison Group (n=461)	
	μ	SD	μ	SD
INPUTS				
HS involvement	11.54	3.61	11.44	3.50
HS leadership	2.85	1.22	2.76	1.19
SRLS Pre-test	3.87	0.55	3.91	0.50
ENVIRONMENT				
COL Involvement	3.41	1.41	3.13	1.47
COL Leadership	2.27	1.51	2.09	1.46
COL Lead Training	1.64	0.48	1.72	0.45
OUTCOMES				
SRLS	3.87	0.52	3.97	0.40
LSE	3.05	0.67	3.08	0.65
CC	2.98	0.52	3.10	0.59
SCB	2.45	0.70	2.51	0.78
SCD	2.81	0.81	3.04	0.76

A summary of the significant differences between these means, and their respective effect sizes, can be found in Table 3.

Table 3

Summary of findings: A Comparison of Agricultural Students with Comparison Group

Variable	p Value	Effect Size
Gender	.02	.09
Race	.003	.23
Political orientation	< .0001	.28
High school involvement	.67	
High school leadership	.23	
College involvement	.003	.11
College leadership	.006	.09
College leadership training	.07	
SRLS pre-test	.40	
SRLS score	.002	.19
LSE score	.23	
Cognitive complexity	.004	.18
Social change behaviors	.28	
Socio-cultural discussions	< .0001	.29

Note: significant differences (p < .05) in **bold**

Discussion

The results revealed that the group of students who reported "Agriculture" as their primary major included slightly more males, was moderately less racially diverse, and reported as moderately more politically conservative than a comparison group of students from the same institutions. Agriculture students and their comparison peers were involved in and led student organizations to similar degrees while in high school. While in college, agriculture students reported slightly higher degrees of involvement with college organizations, and held slightly more leadership positions within them, than the comparison group. However, they did not participate in leadership training events on campus to a greater degree. Perhaps most noteworthy for a study of student leadership outcomes, agriculture students displayed moderately lower levels of leadership capacities in college – while not significantly differing on a "recollection pre-test" of the same capacities in high school. In addition, agriculture students scored

moderately lower on a measure of cognitive complexity and engaged moderately less in socio-cultural discussions with peers when compared to the randomized group of students. The largest differences, measured by effect size, between the two groups were students' political orientation and the degree of engagement in socio-cultural discussions with peers. No differences were found between the groups on measures of leadership self-efficacy and the degree to which students engaged in social-change behaviors such as political activism or community organizing.

These findings suggest that involvement in these organizations may be more nuanced than originally considered, given that agriculture students displayed higher degrees of involvement and less leadership capacity. Students primarily situated within the field of agriculture engaged in these discussions less often than their peers, and that the extent of the gap may be potentially large. In addition, agriculture students displayed a small-to-moderate difference in scoring lower on a test of self-perceived cognitive complexity – that is, the degree to which they reported feeling effective in connecting divergent information and engaging in areas in which they knew little but would like to learn more.

Implications

These findings suggest that the act of engaging with peers in an organization may not be as significant a predictor of leadership development as previously thought. The degree to which students authentically engage with their peers and connect with them around discussions of personal significance may serve as the significant predictor when studying factors within student involvement that lead to increased leadership capacity. Those who serve as course instructors might increase both student cognitive complexity and leadership capacity by incorporating important social issues into their classrooms and curriculum, while allowing, expecting, and encouraging dissenting viewpoints from students who engage in the discussion. In the same way, advisors to students and their organizations might provide more encouragement or opportunity for deep and meaningful dialogue amongst peers.

Suggestions for Future Research

More research must be conducted to examine the relationship between leadership development and socio-cultural discussion, both inside and out of the classroom. In what ways does participation in these discussions lead to the ability to collaborate more effectively, or possess a greater capacity to lead a group within the context of a larger organization? Another line of potential research regards the study of agriculturally-based student organizations in college, not just popularly studied (Anderson, Bruce, & Mouton, 2012; Ball, Garton, & Dyer, 2001; Connors & Swan, 2006; Hastings, Barrett, Barbuto, & Bell, 2011; Park & Dyer, 2010) organizations like FFA and 4-H in high schools.

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Importance and Capability of Teaching Agricultural Mechanics as Perceived by Secondary Agricultural Educators

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Introduction

Agricultural mechanics courses have been a significant part of the agricultural education curriculum since its inception and are popular across the United States (Anderson, Velez, & Anderson, 2011). Numerous studies spanning several decades have underscored the importance of agricultural mechanics as part of a comprehensive secondary agriculture curriculum (Kotrlik & Drueckhammer, 1987; Laird & Kahler, 1995; Reis & Kahler, 1997; Rosencrans & Martin, 1997; Saucier, Terry, & Schumacher, 2009; and Saucier, Vincent, & Anderson, 2011).

Regarding presence of agricultural mechanics in secondary schools, McKim, Saucier, and Reynolds (2010) indicated that nearly 60% of the agricultural education curriculum taught in some states included agricultural mechanics competencies. Specific to Iowa, Rudolphi and Retallick (2011) found that 89.1% of agricultural education teachers ($n = 100$) had taught an agricultural mechanics course. The same state's only agricultural teacher preparation program eliminated agricultural mechanics instruction from 1992 to 2010. Given the popularity of these courses at the secondary level, paired with this gap in formal pre-service instruction, the question must be asked; are current teachers competent to teach these courses?

Theoretical Framework

Bandura's theory of self-efficacy was used to guide this work. Self-efficacy, as defined by Bandura (1977) is a belief in one's capability to execute the actions necessary to achieve a certain level of performance. Bandura went on to state "the stronger the perceived self-efficacy, the more active the efforts" (p. 194). Self-efficacy is gained through mastery experiences, physiological and emotional arousal, vicarious experience, and social persuasion (Bandura, 1997). Predetermined beliefs of teachers often influence how they teach content in both the classroom and laboratory (Knobloch, 2008). These beliefs are formed from a variety of sources, among them, comfort level with the content, (Knobloch & Ball, 2003) and perceived value of the content (Lawrenz, 1985). This framework was selected because this study sought to describe both comfort level and perceived value of selected agricultural mechanics content.

Purpose & Objectives

The purpose of this study was to identify the agricultural mechanics skills in greatest need of both pre-service and in-service training.

The following objectives were identified to fulfill the purpose of this study.

1. Describe the demographic characteristics of Iowa secondary agricultural educators.

2. Describe the importance of selected agricultural mechanics content areas as perceived by secondary agricultural educators.

3. Describe the perceived capability of secondary agricultural educators to teach agricultural mechanics content areas.

4. Determine the discrepancy between the importance of agricultural mechanics content areas and the capability to teach agricultural mechanics content areas as perceived by secondary agricultural educators.

Methods

The target population of this descriptive study was in-service agricultural education instructors who attended the 2010 Iowa agricultural education teachers' conference ($N = 130$). A researcher-modified, paper-based questionnaire containing three sections, consisting of 54 skills, teacher demographics, and program demographics was distributed to each instructor. Usable instruments were collected from respondents ($n = 101$) for a 77.7% response rate. Content validity was established by individuals with expertise in instrument development and agricultural mechanics. Post-hoc reliability calculations resulted in reliability coefficients for importance ($\alpha = .97$) and competency ($\alpha = .98$). Researchers used the Borich (1980) needs assessment model to quantify teacher's perceived ability to teach, and the teachers' perception of the necessity to teach, concepts within agricultural mechanics. Constructs with a higher MWDS were in higher need for in-service training relative to those constructs with a lower MWDS (Garton & Chung, 1997).

Results

Objective One: Demographics

Teacher demographic results are in line with expectations for secondary agricultural educators. A summary of respondent characteristics is displayed in Table 1.

Table 1

Summary of Respondents' Demographic Characteristics

	f	%
Gender		
Male	69	67.0
Female	34	33.0
Highest Level of Education		
Bachelor's Degree	64	62.1
Master's Degree	39	37.9
Years of Teaching Experience		
0-5	32	31.1
6-10	22	21.4
11-15	11	10.7
16-20	7	6.8
21-25	5	4.8
26-30	10	9.7
More than 30	16	15.5
Campus Location Designation		
Rural (population less than 5,000)	80	79.2
Small Urban (population between 5,000 and 20,000)	19	18.8
Urban (population greater than 20,000)	2	2.0
Number of Agricultural Science Teachers in Department		
1 Teacher	91	90.0
2 Teachers	7	7.0
3 Teachers	3	3.0

Objective Two: Importance

Frequencies and percentages of respondents for the ten items with the highest weighted frequency means are displayed in Table 2. Conversely, Table 3 contains the ten items with the lowest weighted frequency means.

Objective Three: Competence

Frequencies and percentages of respondents for the ten items with the highest weighted frequency means are displayed in Table 4. Table 5 contains the ten items with the lowest weighted frequency means with regard to perceived teaching competence.

Objective Four: Discrepancies

Professional development need is determined by the mean weighted discrepancy score (MWDS). Discrepancy scores were calculated in Excel according to the Borich (1980) needs assessment model. The ten items with the highest MWDS are displayed in Table 6.

Table 2

Agricultural Mechanics Areas of Highest Perceived Importance (n = 103)

Importance to Teach:	Frequency (Percentage)					Weighted Frequency Mean
	NI	SI	MI	I	VI	
Welding Safety	2(2.0)	2(2.0)	2(2.0)	11(11.1)	82(82.8)	4.71
Construction Site & Shop Safety	0(0.0)	2(2.1)	12(12.8)	21(22.3)	59(62.8)	4.46
SMAW Welding (Arc)	2(2.0)	3(3.1)	7(7.1)	35(35.7)	51(52.0)	4.33
Small Engine Safety	2(2.2)	1(1.1)	9(10.0)	33(36.7)	45(50.0)	4.31
GMAW Welding (MIG)	2(2.1)	3(3.2)	9(9.5)	31(32.6)	50(52.6)	4.31
Mechanical Safety	3(3.3)	5(5.5)	9(9.9)	22(24.2)	52(57.1)	4.26
Woodworking - Power Tools	2(2.1)	2(2.1)	13(13.5)	33(34.4)	46(47.9)	4.24
Global Positioning Sys. (GPS)	2(2.2)	1(1.1)	13(14.4)	32(35.6)	42(46.7)	4.23
Bill of Materials	1(1.1)	3(3.2)	17(18.3)	27(29.0)	45(48.4)	4.20
Electrical Safety	2(2.2)	8(9.0)	9(10.1)	22(24.7)	48(53.9)	4.19

Note. NI = not important, SI = slightly important, MI = moderately important, I = important, VI = very important.

Table 3

Agricultural Mechanics Areas of Least Perceived Importance (n = 103)

Importance to Teach:	Frequency (Percentage)					*Weighted Frequency Mean*
	NI	SI	MI	I	VI	
Hot Metal Work	8(9.6)	19(22.9)	27(32.5)	21(25.3)	8(9.6)	3.02
Cold Metal Work	8(9.6)	18(21.7)	26(31.3)	22(26.5)	9(10.8)	3.07
Profile Leveling	8(10.1)	14(17.7)	26(32.9)	22(27.8)	9(11.4)	3.13
Pipe Fitting	7(8.5)	18(22.0)	23(28.0)	22(26.8)	12(14.6)	3.17
Metallurgy	7(8.1)	12(14.0)	34(39.5)	23(26.7)	10(11.6)	3.20
Oxy-Prop Cutting	13(16.0)	8(9.9)	23(28.4)	23(28.4)	14(17.3)	3.21
Tractor Overhaul	6(7.1)	15(17.9)	27(32.1)	24(28.6)	12(14.3)	3.25
Differential Leveling	7(8.9)	14(17.7)	21(26.6)	26(32.9)	11(13.9)	3.25
Tool Conditioning	8(9.6)	13(15.7)	26(31.3)	19(22.9)	17(20.5)	3.29
Fencing	9(11.0)	15(18.3)	18(22.0)	21(25.6)	19(23.2)	3.32

Note. NI = not important, SI = slightly important, MI = moderately important, I = important, VI = very important.

Table 4

Agricultural Mechanics Topics with Highest Perceived Level of Teaching Competence (n = 103)

Competence to Teach:	Frequency (Percentage)					*Weighted Frequency Mean*
	NC	LC	MC	SC	VSC	
Welding Safety	4(4.1)	8(8.2)	15(15.3)	30(30.6)	41(41.8)	3.98
Construction Site & Shop Safety	4(4.3)	10(10.8)	16(17.2)	30(32.3)	33(35.5)	3.84
Woodworking - Power Tools	3(3.2)	8(8.5)	24(25.5)	34(36.2)	25(26.6)	3.74
Woodworking - Hand Tools	4(4.3)	9(9.6)	26(27.7)	27(28.7)	28(29.8)	3.70
SMAW Welding (Arc)	4(4.1)	9(9.2)	28(28.6)	33(33.7)	24(24.5)	3.65
Bill of Materials	5(5.4)	11(12.0)	17(18.5)	40(43.5)	19(20.7)	3.62
GMAW Welding (MIG)	5(5.2)	15(15.6)	25(26.0)	28(29.2)	23(24.0)	3.51
Oxy-Acet Cutting	5(5.1)	13(13.1)	26(26.3)	37(37.4)	18(18.2)	3.51
Legal Land Descriptions	6(6.5)	18(19.4)	23(24.7)	26(28.0)	20(21.5)	3.39
Carpentry & Construction Skills	8(8.7)	14(15.2)	24(26.1)	27(29.3)	19(20.7)	3.38

Note. NC = no competence, LC = little competence, MC = moderate competence, SC = strong competence, VSC = very strong competence.

Table 5

Agricultural Mechanics Topics with Lowest Perceived Level of Teaching Competence (n=103)

Competence to Teach:	Frequency (Percentage)					Weighted Frequency Mean
	NC	LC	MC	SC	VSC	
Computer Aided Design	31(38.3)	28(34.6)	14(17.3)	7(8.6)	1(1.2)	2.00
Profile Leveling	20(25.0)	31(38.8)	22(27.5)	5(6.3)	2(2.5)	2.23
Hot Metal Work	20(23.5)	32(37.6)	22(25.9)	10(11.8)	1(1.2)	2.29
Differential Leveling	18(22.2)	29(35.8)	27(33.3)	5(6.2)	2(2.5)	2.31
Cleaning Electrical Motors	17(21.0)	32(39.5)	22(27.2)	7(8.6)	3(3.7)	2.35
Cold Metal Work	18(21.4)	32(38.1)	21(25.0)	12(14.3)	1(1.2)	2.36
Electrical Motors	17(19.8)	32(37.2)	24(27.9)	9(10.5)	4(4.7)	2.43
Oxy-Prop Cutting	24(28.2)	25(29.4)	16(18.8)	15(17.6)	5(5.9)	2.44
Pipe Fitting	21(25.6)	20(24.4)	23(28.0)	16(19.5)	2(2.4)	2.49
GTAW Welding (TIG)	16(18.6)	31(36.0)	22(25.6)	15(17.4)	2(2.3)	2.49

Note. NC = no competence, LC = little competence, MC = moderate competence, SC = strong competence, VSC = very strong competence.

Table 6

Teaching Competencies with Highest MWDS as Perceived by Iowa High School Agriculture Instructors

Rank	Construct	MWDS	Importance Rank	Competence Rank	*n*
1	Global Positioning ms	5.71	8	33	89
2	Electrical Safety	4.67	10	26	87
3	Computer Aided Design	4.51	39	54	80
4	GTAW Welding	4.39	28	45	84
5	Small Engine Safety	4.02	4	12	89
6	Machinery Selection	3.79	6	11	90
7	Use of Survey ment	3.63	29	38	88
8	Plasma Cutting	3.61	12	19	88
9	Electric Controls	3.58	32	42	89
10	Wiring Skills	3.44	22	31	91

Conclusions and Discussion

Objective One: Demographics

The characteristics of teachers in this study were similar to data compiled by the Iowa Department of Education (2010) which reported the following demographic characteristics of Iowa agriculture teachers (n = 195): gender (male = 71.9%, female = 28.1%), highest degree earned (bachelor's = 61.5%), teaching experience (less than 10 years = 42.5%).

Objective Two: Importance

Among the 10 skills perceived to be most important, five related to safety. These results support the conclusions of Dyer and Andreason (1999) who suggested that questions of content and methodology are secondary to those of safety in the agricultural mechanics laboratory. Teachers responding to this study perceived four metals-related skills to be among 10 of the least

appropriate topics for the secondary setting. These perceptions of content value may affect both how and what metals-related skills are taught in the classroom (Lawrenz, 1985).

Objective Three: Competence

Skills related to structures and carpentry were well represented with five such skills surfacing in the list of 10 highest perceived competency ratings. These results diverge somewhat from the findings of Peake, Duncan, and Ricketts (2007) who studied the general competencies of agriculture teachers in Georgia, and reported that respondents (n = 209) perceived themselves to be less competent to teach construction than they were to teach technology, welding, and electricity. This study found teachers in Iowa perceived themselves to be least competent in computer aided design. This aligns with a study of agriculture teachers in Louisiana, which found deficiencies in computer and software specific skills (Kotrlik, Redmann, Harrison, & Handley, 2000). These beliefs regarding teachers' comfort level with this content may impact teaching decisions (Knobock & Ball, 2003).

Objective Four: Discrepancies

This study identified *Global Positioning Systems* as having the most need for professional development. This is in line with the results of Saucier, Tummons, Terry, and Schumacher (2010) who studied agricultural educators in Missouri ($n = 383$), and reported Global Positioning Systems to be the technical competency with the highest perceived need for in-service. Similarly, in a more general study of Georgia teachers ($n = 209$), Peake, Duncan, and Ricketts (2007) identified curriculum integration of agriculture technology advances as the highest need for in-service. These findings contribute to the national trend indicating a need for increased emphasis on emerging agriculture technology in both professional development and teacher preparation programs.

Recommendations & Implications

Researchers recommend this study's findings be taken into account as teacher educators in Iowa plan professional development courses for secondary teachers. Professional development opportunities should focus on agricultural systems technology such as global positioning systems, as well as agricultural mechanics skills relating to electricity. In addition, coordinators of teacher preparation programs in Iowa should take advantage of in-service teacher perceptions by ensuring pre-service teachers are exposed to those skills deemed important by respondents in this study.

Recommendations for future research include investigation and refinement of the need for GPS related training regarding type, depth, and specific content. Additional research should also compare the results from this and similar studies to the perceptions of content importance as perceived by industry representatives. Development of Curriculum for Agricultural Science Education[TM] (CASE[TM]) in Agricultural Technology and Systems is scheduled to begin in 2014 (The National Council for Agricultural Education, 2012). Arguably, data synthesized from studies of both in-service teachers and industry experts should serve as a reference for developers of these curriculum modules.

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Social Presence, Social Interaction, Collaborative Learning, and Satisfaction in Online and Face-to-Face Courses

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Introduction/Conceptual Framework

Researchers have concurred that learning is a social process (Harasim, 2002; Tu, 2000). Social presence and social interaction are factors linked to online learning. Researchers have identified social presence (Short, Williams, & Christie, 1976; Gunawardena & Zittle, 1997; So & Brush, 2008), social interaction (Gunawardena & Zittle, 1997; Picciano, 2002), collaborative learning (Kitchen &McDougall, 1998; Curtis & Lawson, 2001; So & Brush, 2008), and satisfaction (Gunawardena & Zittle, 1997; So & Brush, 2008) as important and essential elements for any successful and effective online course design (McFadden, 2006).

Social Presence

Social presence has been noted a necessity to improve instruction in both traditional and online learning environments (Gunawardena, 1995). Simply, social presence is the perception there is another real person taking part in the interaction (Tu & McIssac, 2002). And, more generally speaking, it can be considered a continuum reflecting the degree to which participants believe they know one another (Rourke, Anderson, Garrison, & Archer, 2001). Therefore, social presence can be regarded as an ability to socially and emotionally project himself/herself in a course or online community (Rourke, Anderson, Garrison, & Archer, 2001).

Short, Williams, and Christie (1976) placed emphasis on the quality of the communication medium, while noting the "communications media vary in their degree of social presence and that these variations are important in determining how individuals act" (p. 65). Face-to-face communication was determined the most important form of socially-present media, followed by video and audio communications ranking second and third, respectively (Tu, 2002). Now, more than ever, many researchers are conducting studies on social presence. And, many have demonstrated high levels of social presence will facilitate better online communications and learning.

Social Interaction

Social presence is said to be a vital element to influence online interactions (Tu, 2002; Tu & McIssac, 2002). "Social interaction is defined as interaction between learners and instructors that occurs when instructors adopt strategies to promote interpersonal encouragement and social integration" (Jung, Choi, Lim, & Lee, 2002, p. 153). Learner-to-learner interaction is said to be motivating and stimulating for students (Moore & Kearsley, 2005), while being a critical element to online learning (Richardson & Swan, 2003). Garramore, Harris, and Anderson (1986) caution when the level of social presence is low, interaction is low. While Gundawardena (1995) warned without interactions, learning should not be expected.

Collaborative Learning

An important aspect of collaborative learning is the move from assimilation to construction, i.e., creating new understandings, based on students' discussions (Puntambekar, 2006). Collaborative learning requires cognitive and environmental determinants, social presence is required to enhance and foster online social interactions, a major vehicle for collaborative learning (Tu, 2000).

Educators have attempted to incorporate collaborative learning methods in their distance education courses with the belief that increased interactions among students could enhance learning outcomes and student satisfaction (Curtis & Lawson, 2001). However, despite popular support among educators for collaborative learning approaches, prior research studies suggest students are often dissatisfied and frustrated with their collaborative learning experiences (Kitchen & McDougall, 1998).

Satisfaction

Satisfaction is defined as "an affective learning outcome indicating the degree of: learner reaction to values and quality of learning, and motivation for learning" (So & Brush, 2008, p. 323). So and Brush contend when evaluating the effectiveness of courses, student satisfaction plays an important role.

During the past decade, educators in the field of agriculture have made strides to understand online learning. Researchers have studied a sundry of topics related to distance education. Agriculture educators began their approach to understanding online learning by first identifying opportunities and obstacles related to online learning (Miller, 1995; Murphy & Terry, 1998; Murphrey & Dooley, 2000). Similar to other disciplines, agriculture educators also compared on- and off-campus courses (Miller & Shih, 1999; Miller & Pilcher, 2001; Moore & Wilson, 2005) and identified relevant educational technologies that would support online learners (Murphy & Terry, 1998, Murphy, 1999; Dooley & Murphy, 2001). Evaluation of online courses is also prevalent in literature related to online courses in agriculture (Murphrey, 2010; Roberts, Irani, Lundy, & Teig, 2004; Mink & Moore, 2005).

However, the broader base of literature suggests social presence, social interaction, collaborative learning, and satisfaction are important to online learning and the media used to deliver a course can be influenced by these constructs. This broader base of literature comes from research in disciplines such as administration and supervision, health education, and distance education. Unfortunately, none of these studies focus on courses in agriculture.

Moreover, there is a lack of research from all disciplines that examines the constructs related to social presence, social interaction, collaborative learning, and satisfaction in agriculture online courses and face-to-face courses. It is not known if online courses compare favorably to face-to-face courses in facilitating social presence, social interaction, collaborative learning, and satisfaction.

Purpose

The purpose of this study was to describe and compare students' perceptions of social presence, social interaction, collaborative learning, and satisfaction in online and face-to-face courses.

Research Questions

1. Describe and compare the students' perceptions of social presence in online and face-to-face courses.
2. Describe and compare the students' perceptions of social interaction in online and face-to-face courses.
3. Describe and compare the students' perceptions of collaborative learning in online and face-to-face courses.
4. Describe and compare the students' perceptions of satisfaction in online and face-to-face courses.

Methods/Procedures

The purpose of this descriptive survey research study was to describe and compare students' perceptions of social presence, social interaction, collaborative learning, and satisfaction in online and face-to-face courses. Data were collected with a questionnaire that included instruments to measure social presence, social interaction, collaborative learning, and satisfaction. To control for measurement error, validity and reliability of the instruments was established a priori except for the social interaction scale. For the social interaction scale, data collected for this study was used to calculate internal consistency. A panel of experts examined the instrument for construct validity.

Subjects

The population for this study was students enrolled in off-campus sections of the College of Agriculture and Life Sciences online courses during three consecutive semesters.

Instrumentation

Social Presence

Student perceptions of social presence were measured with the Social Presence Scale developed by Picciano (2002). The scale consists of nine 5-point Likert-type items with response options ranging from strongly disagree (1) to strongly agree (5). Cronbach's alpha was calculated on data obtained from the respondents in the study. The coefficients were .72 for face-to-face courses and .76 for online courses.

Social Interaction

Student perceptions of social interaction were measured with the Social Interaction Scale. The scale consists of six 5-point Likert-type items with response options ranging from strongly disagree (1) to strongly agree (5) and was used to examine performance in an online course in relationship to student interaction and sense of presence in the course. Cronbach's alpha was calculated on data obtained from the respondents in the study. The coefficients were .84 for face-to-face and online courses.

Collaborative Learning

Student perceptions of collaborative learning were measured with the Collaborative Learning Scale developed by So and Brush (2008). The scale consists of seven 5-point Likert-type items with response options ranging from strongly disagree (1) to strongly agree (5) and used to measure students' perceived levels of collaborative learning, social presence, and overall satisfaction. Cronbach's alpha was calculated on data obtained from the respondents in the study. The coefficients were .84 for face-to-face courses and .88 for online courses.

Satisfaction

Student perceptions of satisfaction were measured with the Satisfaction Scale developed by So and Brush (2008). The scale consists of eleven 5- point Likert-type items with response options ranging from strongly disagree (1) to strongly agree (5) and used to measure students' perceived levels of collaborative learning. Cronbach's alpha was calculated on data obtained from the respondents in the study. The coefficients were .90 for face-to-face courses and .93 for online courses.

Data Collection

Students completed an online questionnaire, which answered questions regarding perceptions and experiences related to constructs. All College of Agriculture and Life Sciences students enrolled in three semesters of online courses were invited to complete the questionnaire. Using Dillman's Tailored Method Design (Dillman 2000), five contacts were made to the online learners encouraging them to complete the questionnaire.

Data Analysis

SPSS was used to generate descriptive statistics, such as frequencies, percentages, means, modes, medians, ranges, and standard deviations. SPSS was also used to generate inferential statistics such as t-test and Mann-Whitney U test.

Findings

Social Presence

Participants believe communication in online courses (34%) was more impersonal than in face-to-face courses (16.8%). The majority (85.3%) of respondents were able to form distinct impressions of some students in face-to-face courses, but fewer than half (47.7%) were able to

do this in online courses.   Overall, online learner's perceptions of social presence in face-to-face courses were higher than perceptions regarding online courses. There was a significant difference in the overall mean scores in student perceptions of social presence in online courses (M=3.27, SD=.68) compared to face-to-face courses (M=3.58, SD=.53).

Social Interaction

In response to the statement "courses are an excellent means for social interaction," 80% of the online learners strongly agreed or agreed to this statement in regards to face-to-face courses compared to 26.9% for online courses. More participants felt comfortable interacting with students in face-to-face courses (83.1%) than in online courses (68.8%). Respondents strongly agreed or agreed the amount of interaction with instructors was more appropriate in face-to-face courses (79.7%) than in online courses (64.1%). Also, respondents strongly agreed or agreed that the amount of interaction with students was more appropriate in face-to-face courses (77.5%) than in online courses (56.5%). Additionally, online learner's perceptions of social interaction in face-to-face courses (77.5%) were higher than perceptions regarding online courses (44%).   There was a significant difference in the overall mean scores for social interaction in online courses (M=3.39, SD=.80) compared to face-to-face courses (M=3.60, SD=.64).

Collaborative Learning

Almost 72% of the online learners strongly agreed or agreed they were able to develop problem-solving skills through peer collaboration in face-to-face courses compared to 28.2% in online courses. In face-to-face courses, 67% of participants believed to be part of a learning community compared to almost 50% in online courses. When asked if collaborative learning in my courses was effective, 67% strongly agreed or agreed for face-to-face courses and 41.3% for online courses. There was a significant difference in the overall mean scores for collaborative learning in online courses (M=2.92, SD=.93) compared to face-to-face courses (M=3.56, SD=.75).

Satisfaction

Respondents strongly agreed or agreed they were able to learn in both face-to-face (93%) and online (89.3%) courses. There was also strong agreement (85.9%) with the statement "the courses were a useful learning experience" in both face-to-face and online courses. Generally, online learners' perceptions regarding statements related to face-to-face courses were more favorable than their perceptions regarding online courses. There was a significant difference in the overall mean scores for satisfaction in online courses (M=3.49, SD=.91) compared to face-to-face courses (M=3.81, SD=.63).

Conclusions

The information from this study can be used to support pedagogy to increase social presence, social interaction, collaborative learning, and satisfaction in both educational settings. The following 4 conclusions were drawn from the findings of this study.

1. Face-to-face courses do a significantly better job of addressing social presence issues than online courses.
2. Face-to-face courses do a significantly better job of addressing social interaction issues than online courses.
3. Face-to-face courses do a significantly better job of addressing collaborative learning issues than online courses.
4. Face-to-face courses were significantly more satisfying to participants than online courses.

Recommendations

1. It is recommended educators continue to develop strategies to create online environments where students feel a greater sense of social presence, social interaction, collaborative learning, and satisfaction.

2. It is recommended that educators and researchers establish and implement best practices to increase social presence, social interaction, collaborative learning and satisfaction in online courses.

3. As technology continues to evolve, longitudinal studies should be developed to document changes in students' perceptions of social presence, social interaction, collaborative learning, and satisfaction in online courses over time.

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Sustainability of Professional Development to Enhance Student Achievement: A Shift in the Professional Development Paradigm

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Introduction

The need for quality professional development is unmistakable. Few teachers receive quality professional development that is content-focused, intensive, and sustainable according to Birman et al. (2007). Teachers have not received effective professional development needed to improve student learning (Kedzior & Fifield, 2004). According to Yoon, Duncan, Lee, Scarloss, and Shapley (2007), traditional professional developments are designed as "single-shot, one-day workshops that often make teacher professional development 'intellectually superficial, disconnected from deep issues or curriculum and learning, fragmented, and noncumulative'" (p. 1). Young, Edwards, and Leising (2008, 2009) and Stone, Alfeld, Pearson, Lewis, and Jensen (2007) reported on the effectiveness that teacher quality professional development had on increasing student academic scores. Both studies demonstrated the effect Math-in-CTE had within Career and Technical Education (CTE) curricula.

In the Math-in-CTE Follow-up, experimental teachers felt that professional development was vital to understanding and properly using the seven-element pedagogical model. Teachers believed success was due to the intensiveness of ten days of professional development throughout the study. New learning communities were created between the CTE and mathematics teachers. Data from the follow-up study determined that three-quarters of the experimental teachers reported continued use of the pedagogic model and the math-enhanced lessons developed during the study. Control teachers who received minimal, or traditional, professional development reported limited effectiveness (Lewis & Pearson, 2007). Based on these factors, it would be beneficial to know if science-enhanced curricula and extended professional development could have as much of a sustaining impact on CTE and science educators and students as was observed with the Math-in-CTE participants.

Theoretical Framework

Traditional professional development could often be described as one-day workshops that are held during the school day, fragmented to cover a variety of content or topics, and involved fun activities that produced little or no improvement to teaching pedagogy (Ruhland & Bremer, 2002). How can teachers shift their pedagogy to effectively integrate core academics into their CTE curricula without loosing the true nature of the CTE content? Presently, Perkins IV requires CTE teachers to change their method of teaching CTE curricula by incorporating core academic content into their programs of instruction.

There are various models of change that could be employed to help teachers modify their pedagogy. One such method is the transtheoretical model of behavior change (Prochaska, Johnson, & Lee, 2009; Prochaska, DiClemente, & Norcross, 1992). The model addressed five stages of change—precontemplation, contemplation, preparation, action, and maintenance. In

the precontemplation stage, individuals are not planning to make any changes in the near future. Contemplation means that individuals fully intend to change in the near future. The preparation stage shows individuals not only have a plan for change, but they intend to make it happen within a month. The action stage is where the change occurs. After a change has occurred, it is necessary to refrain from returning to the undesired behavior. Therefore, the maintenance stage is a preventative stage and typically individuals will spend a majority of their time in this stage. A sixth stage that is more often unattained is the termination stage. When an individual has succeeded in making the change and preventing a setback, they can proceed to the termination stage. At the termination stage, an individual is able to maintain the desired behavior from this point forward without hesitation or temptation (Prochaska et al., 1992).

How does the transtheoretical model of behavior change relate to professional development and academic content integration? CTE teachers are at varying stages of change as they integrate core academic content into their CTE programs to align with Perkins IV and NCLB legislations. Similarly, traditional professional development practices are not aligned with teachers' attitudes, and thus, will not be effective in producing and maintaining teacher change. In a study of more than 1,000 mathematics and science teachers, collective participation was listed as one of the characteristics that make professional development effective (Garet, Porter, Desimone, Birman, and Yoon, 2001). Collaborative professional development can be used to bring about positive and effective change to CTE and core academic teachers.

Purpose

The purpose of this study was to determine the sustainability of professional development—teacher utilization of the Science-in-CTE pedagogical model and CTE science-enhanced lessons in curricula one year following the Science-in-CTE Pilot Study. The Science-in-CTE Follow-up Study was a partial replication of the Math-in-CTE Follow-up Study. The information obtained from this follow-up research study would be beneficial to secondary CTE and science teachers by providing sustainable professional development practices and pedagogy that would bridge CTE and core academic curricula to enhance student achievement.

Research Questions

Utilizing two research questions, a follow-up study was needed to determine the sustainability of seven days of intensive professional development between secondary CTE and science teachers.

1. To what extent would CTE teachers who participated in the Pilot Study continue to use the pedagogical model and specific lessons that had been developed for the study after the experiment ended?

2. To what extent are science teachers who worked with the experimental CTE teachers using the pedagogical model or any of the occupational examples from the lessons developed in their academic classes?

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Methods and Procedures

A Science-in-CTE Pilot Study was conducted in 2009-2010 among 41 North Dakota Agricultural Education and science teachers (15 experimental CTE, 14 control CTE, and 12 science teachers). The Follow-up Study was designed to investigate the extent to which Agricultural Education CTE teachers continued to use the science-enhanced lessons and seven-element teaching model one year after the conclusion of the Pilot Study. The Science-in-CTE Follow-up Study was a partial replication of the Math-in-CTE Follow-up Study. It was determined that similar components would be utilized in the science follow-up—a questionnaire, and personal and telephone interviews. Slight modifications were made to reflect the needs within the academic science content and North Dakota CTE programs.

A mixed-methods research approach to data collection was used (Creswell, 2002). The questionnaire was designed to conduct survey research that primarily obtained quantitative data. The questionnaire included open-response questions where qualitative data were analyzed. Qualitative data were collected through personal and telephone interviews. Responses from the personal and telephone interviews were compared to responses from the questionnaires to further evaluate the extent of use or justification of non-usage of the science-enhanced lessons.

Online questionnaire. Online questionnaires were used to ascertain the extent teachers used the pedagogical model or any of the science-enhanced CTE lessons originally developed for the Pilot Study. The questions included on the questionnaire were derived from the Math-in-CTE Follow-up Study. Slight modifications were made to reflect the science content and programming of North Dakota Agricultural Education teachers. A panel of experts reviewed the questions to determine content validity.

Personal and Telephone Follow-up Interviews. Based on the completed online questionnaire, CTE teachers who indicated using explicit science instruction or parts of the pedagogical model in their lessons were contacted to participate in personal interviews. Science teachers who indicated using methods, materials, or agricultural examples from the Science-in-CTE Pilot Study were invited to complete a personal interview. In-depth personal interviews were used to verify the teachers' questionnaire responses and gain a better understanding of how the model and lessons were used. Telephone interviews were used to verify whether participants had used any part of the science model and lessons and their reasoning for not including them in their curricula.

Findings/Results

An e-mail invitation was sent to all 41 participants (15 experimental CTE, 14 control CTE, and 12 science teachers) of the Science-in-CTE Pilot Study inviting them to participate in the Follow-up Study. Thirty-five out of 41 participants completed the online questionnaire for an overall response rate of 85%. All of the experimental Agricultural Education teachers (100%) completed the online questionnaire, as well as 10 of the 14 control Agricultural Education teachers (71%) and 10 of the 12 science teachers (83%). Of the experimental CTE and science teachers who indicated using at least portions of the lessons or model, 20 of the 21 teachers (95%) received a personal follow-up interview, while three of the four teachers (75%) who stated they did not teach any of the lessons participated in a telephone follow-up interview.

Research Question 1 Analysis. Thirteen (87%) of the 15 experimental CTE teachers reported the inclusion of explicit science instruction that was designed to teach the concepts inherent within their secondary Agricultural Education courses. The remaining two teachers (13%) did not teach secondary Agricultural Education courses during the 2010-2011 school year. Therefore, of the 13 experimental teachers who taught explicit science, 12 (92%) used a combination of Science-in-CTE materials that included the science-enhanced lessons and the pedagogical model (see Figure 1).
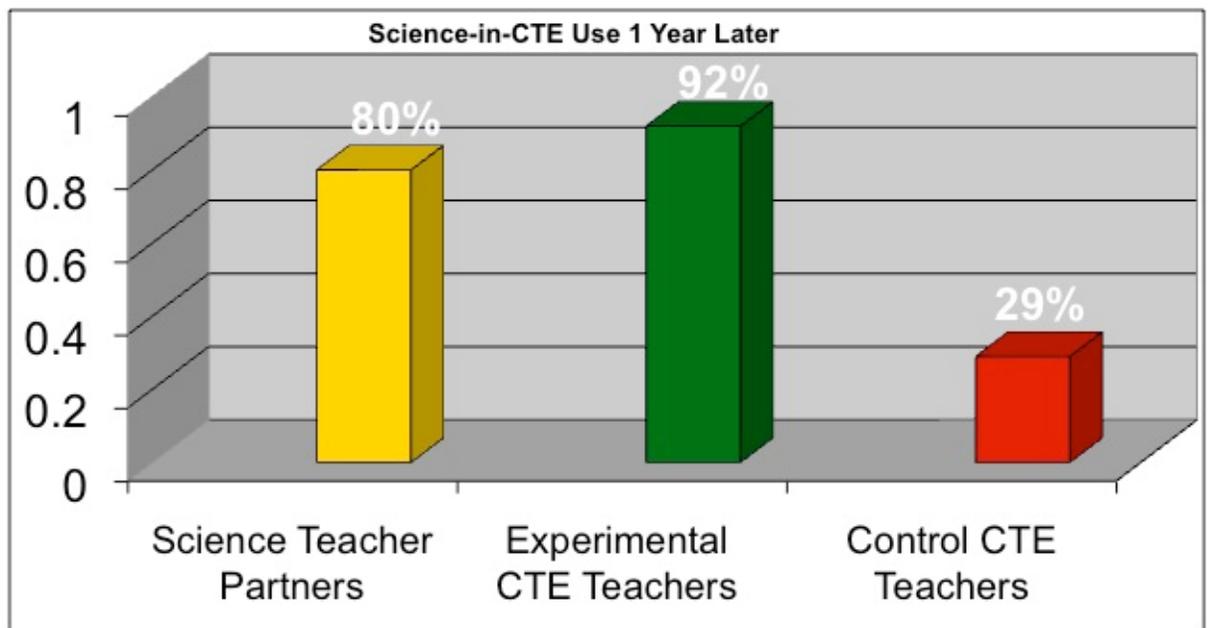

Figure 1. Use of Science-in-CTE Methods or Materials During 2010-2011 School Year By CTE and Science Teachers Who Responded to the Questionnaire

Ten of the 14 control CTE teachers completed the questionnaire. Of the 10 control CTE teachers, one (10%) reported that they were no longer teaching CTE courses and two (20%) reported they had taught CTE courses that did not include explicit science. The remaining seven (70%) control CTE teachers indicated they had taught explicit science a year after the Pilot Study, but only two (29%) of those teachers indicated that they had used the Science-in-CTE method and lessons in their curricula (see Figure 1).

Research Question 2 Analysis. Ten of the 12 science teachers completed the questionnaire. Of the 10 teachers who responded, two science teachers (20%) indicated they taught science during the 2010-2011 school year, but did not include any of the methods or examples from the lessons developed for the Science-in-CTE study in their classroom. However, eight (80%) of the 10 respondents used methods or examples from the lessons developed for the Science-in-CTE Pilot Study in their science classes (see Figure 1). Of the eight science teachers, 100% stated they used specific agricultural examples from the lessons. Four (50%) of the eight science teachers who used methods or examples from the Science-in-

CTE lessons indicated that they specifically used elements of the Science-in-CTE pedagogical model.

Conclusions

A new model of professional development is sustainable as demonstrated by 92% of the experimental CTE teachers who attained the maintenance phase of the transtheoretical model of behavior change continued to use the Science-in-CTE lessons and model one year following the Pilot Study. In contrast, only 29% of control CTE teachers utilized materials received from the traditional professional development. Upon completion of the Pilot Study, none of the teachers received technical support, added professional development, or monetary compensation for continuing to use the lessons or model. While the Pilot Study's professional development focus was on the experimental CTE teachers, an unexpected consequence occurred when 80% of the science teachers elected to incorporate portions of the lessons or model into their curricula.

Implications of the Findings

The Science-in-CTE Follow-up Study showed that the professional development model is sustainable. The number of experimental CTE teachers who continued to use the methods and lessons one year after the Pilot Study concluded was consistent with data reported in the Math-in-CTE Follow-up Study (Lewis & Pearson, 2007, pg. 14, Table 3). There was consistency in the percent of science teachers who used the model and agricultural examples from the lessons as compared to the math teachers from the Math-in-CTE Follow-up Study (Lewis & Pearson, 2007, pg. 18, Table 7). Overall, the type of professional development offered in the Math-in-CTE and Science-in-CTE studies are different than traditional professional development. The process used in this model allows for teachers to move from professional development and into technical assistance.

Recommendations

Data from this study suggests that further research should be conducted on the following:

1. Would the methods and model be sustainable strictly as a professional development without the confines associated with a research study?

2. Is the Science-in-CTE model adaptable to other Agricultural Education instructional units or topics? Other CTE content areas?

3. Would teachers continue to utilize the model in years following the professional development?

4. Would teachers benefit from a periodic "refresher" professional development? If so, how soon following a professional development?

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Uses Of Social Media By State Politicians In Relation To Agricultural Policy

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Introduction

There have been changes and advancements over time in agricultural policy in the state and federal governments of the United States. With changes in policies come the opinions of those invested in the portions of the industry that are impacted by the policy. Those interested in making their opinions known to policy makers use a variety of tools to communicate their opinions to government officials, and to the public; and those tools change and advance as communication media changes. It seems that the recent advancement in Internet technology and the evolution of social media has created a new tool to facilitate communication between policy makers and those interested in the policies that impact the agricultural industry.

Social media users use these technologies to participate in many different things, including politics. According to a PEW research survey, "Among social networking site users, 40% of Republican voters and 38% of Democratic voters used these sites to get involved politically," (Smith, 2011, p. 2). With all of the political use of social media, there is potential for citizens and organizations to impact policy more than in the past.

There are many studies that show how the public is using social media with politics, but there are very few that show how politicians are using social media. While some Capitol Hill staffers have said that the Internet has decreased the quality of constituent messages, others are reporting some negative buzz about using social media to engage constituents, because it is difficult to determine who are true constituents (Lovely, 2011). Despite this, politicians do use social media, but most research done to understand how they use it has been on the national level during elections (Abroms & Lefebvre, 2009; Johnson & Perlmutter, 2010; Rigby, 2008; Qualman, 2011; Brundidge, 2008). Little research has been done in the agricultural field looking at politicians' use of social media to find resources. Research is needed to understand how politicians gather information on social media when making policy decisions, especially those related to agriculture.

Conceptual Framework

This study is guided by three areas of research: Media Richness, Social Presence, and Groundswell. Media richness theory suggests that a message sender chooses a medium to send a message based on their desired outcome and the information carrying capacity, or richness, of the medium (Daft & Lengel, 1986). Criteria that determine richness of media include capability for immediate feedback, capacity for multiple cues, provision for the use of natural language, and potential to convey a personal focus. These criteria are similar to the ideas in social presence theory that determine a medium's level of social presence, or amount of interpersonal contact a medium allows. Studies in these theories have shown that media that allow natural interactions are valued, and that social media can have high richness and social presence. Features in interpersonal communication are important in social presences theory: nonverbal signals, proximity, orientation, and physical appearance (Short et al., 1976). Both theories can guide how

we use online media, and they support the groundswell trend, that people are using social media to get things from each other to achieve goals. People depend on each other to draw on other's strengths, and they have always rebelled against institutions through social movements, but the balance between institutions with many resources and their constituents is changing because of social technologies. The ever-evolving technologies of today have changed many things about how people communicate with each other and interact. Reason for this, in part, is due to the wide spread use of the Internet (Li & Bernoff, 2011).

Purpose

The national research agenda in agricultural education has made a call to researchers to better understand how to reach policy makers with agricultural information (Doerfert, 2011). A study was needed to examine how politicians are using social media, and if they are using social media when making policy decisions related to agriculture. This information can help the public to better understand how to engage their elected officials using social media. Thus, the purpose of this study is to examine how State House of Representatives and Senate members are using social media, and how they are using it as it relates to agriculture and agricultural policy decision-making. Based on the conceptual framework the following objectives guided the study:

1. Describe the use of social media by House of Representative and Senate members.
2. Compare the agriculture background of House of Representative and Senate members to their use of social media.
3. Describe House of Representative and Senate members' social media connections to agricultural organizations.
4. Describe social media effects on House of Representative and Senate members' agriculture policy decision making.

Methods

This study collected data from eight qualitative interviews in order to richly understand current trends. There is not a general rule of how many participants should be included in a qualitative study, so sampling of a population is typically stopped when saturation of data is reached (Ary, et. al., 2010). In this study, eight participants were sampled to start, and at the conclusion of the eight interviews it was determined that saturation of data had been reached, and no more participants were sampled.

There are 132 people in the target population, 25% Senators and 75% Representatives. Lists of the current Representatives and Senators were obtained from their websites. The lists were alphabetized and a number was assigned to each name. A random number generator was then used to randomly sample the population. In order to maintain the proportion of Senators and Representatives in the target population, two Senators and six Representatives were randomly selected. Random selection of participants was used in order to prevent interviewing only members of the population that are known for social media use, or for their knowledge of agricultural issues. Opinions and data from all schools of thought on social media use were desired, and random selection was the process that worked best to achieve this.

Interviews were conducted both in-person and by phone, depending on the preference and availability of the participant. The interview protocol was developed based on findings and surveys of previous research. Several experts, including researchers and governmental relations staff from A State University, determined validity of the interview questions. The experts had knowledge of social media and agricultural policy in the state.

The data was then analyzed using open coding, which is used to develop major themes and categories within the data (Ary, et. al., 2010, p. 464-465). Reliability, often referred to as dependability or trustworthiness in qualitative research (Ary, et. al., 2010), was addressed through documentation throughout the study. The data collected was also transcribed, kept, and checked for consistency by the lead author and by another researcher at the university. The lead author has a background growing up in the agricultural industry and is an avid social media user. The author's understanding of politics was limited as she had not been involved in any political activities.

Findings

This study found that most Representatives and Senators studied are using social media, but that they are still developing that use, and still deciding the value of conversations held through social media. Themes found in describing use of social media by House of Representatives and Senate members included: *Facebook, Twitter, and LinkedIn* use; *both* personal and professional use of social media; friend requests and follows are addressed through *common friends, suggestions, personal friends*; social media is used *every day or every other day*; there is campaign use of social media; management of social media efforts is done by *self with help*; *no* monitoring of what is said on social media is done; and constituent communication is done via *email, phone calls, face-to-face, and directed off social media.*

The major theme found in agriculture backgrounds was that the majority of participants had *very little agriculture background*. When answers about social media use from participants that indicated very little agriculture background were compared to answers from the participant that indicated a background in agriculture the themes found in both were *regular social media use* and *value in social media.*

Themes found regarding social media connections to agricultural organizations included: agricultural information was obtained from *constituents* and *farm bureau*; familiarity with agricultural organizations, companies, people, etc.… that use social media include *probably* and *farm bureau*; *no* conversations with agricultural groups are held through social media; and *no* agricultural information is obtained through social media.

Describing social media effects on House of Representatives' and Senators' agriculture policy decision-making was the fourth objective of this study. Participants were asked if any information or campaigns using social media had ever affected their voting decisions, and if so what about the campaign was effective. The major themes found in regards to information or campaigns using social media affecting voting decision were *no* and *not social media exclusively.*

Conclusions

It was found that most Representatives and Senators are using social media, but that they are still developing that use, and still deciding the value of conversations held through social media. It would seem that social media is not impacting policy voting on agricultural issues much at this time, but with some relationship building and continued engagement by individuals, social media could become the next email in terms of elected official communication with constituents.

The themes that emerged in the participant answers suggest that right now social media campaigns cannot be used exclusively in an attempt to change agricultural policy with politicians. As emerged before, constituent communication is important to the participants and that communication needs to be personalized. Answers did not indicate that social media would not ever affect their voting decisions, but it would not likely be the first way someone wanting to affect policy should contact their elected official. Again, this shows that the richness and social presence of email, phone calls, and face-to-face meetings is valued over the richness and social presence of social media.

Implications for researchers

Media richness theory (Daft &Lengel, 1986) and social presence theory (Short et. al., 1976) both order, or rank, media based on their uses and effects. Studies that rank the richness and social presence of social media would be helpful in other research of social media in politics.

Other research areas that would be suggested from this study also include more studies of how politicians are communicating with their constituents through social media. Themes in this study suggest that some politicians when communicating with constituents use social media a little, but further research would shed more light on the conversations held and their effects.

Implications for practitioners

Several implications for those interested in impacting policy were surfaced in this study. One of the biggest implications is that relationship building before and during interactions using social media are important. The participants' answers suggest that they likely do no start up, participate in, or pay attention to conversations with others on social media without having some sort of personal interaction with the conversation starter prior. Several participants indicated that they do not accept friend requests from people that they do not know, or at least do not have personal connections to, or that they do not recognize. While not all interaction through social media happens through personal profiles that require friend acceptance, this would suggest that having a relationship with the elected official before social media interaction would enhance the social media interaction.

Another implication of this study is that groups, organizations, and companies have very little to no impact on policy decisions using social media. The Representatives' and Senators' answers in this study suggest that little attention is paid to these groups on social media, and that more attention is paid to individuals. Knowing exactly whom they are communicating with was important to the participants. Being able to put a face to whom they are communicating with is important to them. This suggests that if a group, organization, or company wishes to

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communicate their thoughts on a policy through social media they should do so through an individual, and not a group page, or they should have individuals that communicate with the politicians regularly face-to-face.

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Resilience and the Preservice Teacher

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Introduction

Agricultural educators hold a position that bears much responsibility and is accompanied by many forms of stressors, making a high level of resilience particularly essential to this group (Anderson, 2010; Croom, 2003; Straquadine, 1990; Torres, Lambert, & Lawver, 2009; Walker, Garton, & Kitchel, 2004). Copious amounts of literature exist on the self-reported stress levels and stressors of teachers (Kyriacou, 2001); yet agricultural educators continue to be in short supply in relation to demand and high attrition rates, especially in the early years, plague the profession (Kantrovich, 2007). Subsequently, if the profession is to achieve actively and emotionally engaged learners across all environments, as indicated in the National Research Agenda (Doerfert, 2011) we must incrementally improve retention of our teachers.

Within education, many factors have a cumulative effect on teacher stress, which can then be exacerbated by stressful experiences within the context of a teacher's personal life (Schroeder, 2006; Steinhardt, Jaggars, Faulk, & Gloria, 2011; Torres, Lawver, & Lambert, 2009; Wattoo et al., 2009; Yoon, 2002). Individual stress can result in negative health outcomes, reduced job performance, and an undesirable effect on organizational health (Mulder et al., 2002; Murray, Flowers, Croom, & Wilson, 2011; Rieg, Paquette, & Y., 2007; Sabanci, 2011; Sapolsky, 2004). This phenomenon drew the interest of researchers, whose investigations have produced much data as well as many models and methods about the phenomenon of resilience (Masten, 2001). Resilience, as found within the structure of positive psychology, is increasingly being used as a framework to examine educator stress (Bobek, 2002; Brunetti, 2006; Castro, Kelly, & Shih, 2010; Howard & Johnson, 2004). Application of a resilience framework to agricultural education has the potential to positively influence many aspects of the profession from retention rates to quality of life for professionals (Thieman, Ball, & Kitchel, 2012).

Framework

The study of resilience has a theoretical base in positive psychology which focuses on the positive attributes and potential, rather than the negative aspects of an individual (Snyder & Lopez, 2009). The approach to teacher resilience utilized for this study was developed by Castro, Kelly, and Shih (2010), wherein they adopted a position utilizing aspects from both the multidimensional approach and the strategy approach. They identified teachers as "active agents, adopting various strategies to find balance and achievement in the face of adversity, often caused by minimal resources and challenging working conditions" (Castro et al., 2010, p. 623).

Purpose and Research Questions

The purpose of this phenomenological study was to characterize teacher resilience of preservice high school agricultural educators. The goal of a phenomenology is to describe a phenomenon through the lived experiences of persons involved in the phenomena (Creswell, 2007). The central question around which the research questions were developed for this study

is, "What resilience characteristics do pre-service teachers exhibit?" This study is part of a larger design, which is focused around the question, "What does resilience look like in novice teachers?"

The following research questions guided the data collection and analysis for this study:

1) How does the motivation for becoming a teacher relate to resilience of the beginning teacher?
2) What qualities of resilience do emerging/pre-service teachers perceive they possess and how might this impact their performance?
3) What questions/thoughts do beginning teachers have about the upcoming school year relating to coping and stress?
4) What resilience strategies (support, problem-solving, positive relationships, seeking rejuvenation/renewal) do the teachers use?

Methods

The population of the study was pre-service teachers (N=16, n=10), five female and five male, scheduled to enter student teaching internship in Spring 2011. All participants were traditional college students; most were former FFA members from traditional, rural high school agriculture programs. Almost half entered the University of Missouri with a major other than Agricultural Education, from a variety of majors ranging from agricultural systems management to middle school science, and all participants were able to achieve certification at the end of four years of study.

Qualitative data were collected from multiple sources including: one interview, one journal, and field notes from the interview. In the first week of the Fall 2011 semester, reflection journals with open-ended questions were followed with individual interviews at the end of the semester. Two researchers completed open coding of interview transcriptions, reflective journals, and field notes and then grouped codes into emergent themes. Finally, themes were reconciled to form the final themes and recoded accordingly.

Trustworthiness was established using recommendations from Creswell (2007) and Lincoln and Guba (1985) through triangulation of data sources and the use of multiple investigators to provide consensual validation of the analysis. Participants were asked to review the findings in an effort to provide confirmability and dependability.

As former secondary agricultural educators, researchers drew upon prior experiences when formulating thoughts regarding teacher resilience. An underlying assumption that pre-service teacher education could always be improved slanted interpretation to that of looking for improvement of teacher preparation programs.

This study was comprised of novice teachers who received their teacher preparation from the University of Missouri and are trained exclusively as agricultural education secondary teachers. Therefore, this study cannot to be generalized beyond the participants; however, this

method of participant selection will provide valuable information for the teacher educators of this institution.

Findings

Youth experiences are a key component toward reflection on resilience.

Teaching high school agriculture requires new teachers to dig into the depths of their background and channel those experiences into meaningful classroom discourse. Several participants identified their participation and involvement in youth organizations such as FFA and 4-H as useful for gaining skills and experiences that will prepare them to teach: "I was really active in 4-H before FFA and as I got high school age, I became a junior leader and was a project leader with little kids, all those will help with teaching." Others recounted work with younger people as experiences preparing them for teaching and working with students. When describing helping a younger brother with homework, one student teacher said, "Whenever I see it in his eyes, he's getting it and if I can see that in my students I think that's about all the gratitude I'm ever going to need."

The uncertainty of the reality of the job could counter resilience.

The cloud of uncertainty that hovers in the weeks before student teaching was evident in responses to career and professional intentions. This uncertainty ranged from work/life balance, creation of self-identity, and a perspective on the profession. One teacher captured the sentiments of this particular group in her comment; "…we can play pretend [in methods courses] but I know it's going to be totally different when you have kids every day." In developing a perspective on the profession, one teacher said, "I want to see how student teaching goes before I decide if [teaching] is something I want to do long term."

The demands placed on agricultural educators through the many components of the program caused several pre-service student teachers to question their abilities to cope with what lies ahead. One teacher poignantly stated, "I'm worried about burnout." Another indicated, "I'm apprehensive about being an ag teacher because of balancing my personal life."

In light of an uncertain job market, the enticement of employment within the agriculture industry sector creates a dilemma for someone nearing graduation.

I really want to teach, but when I first started there was a little side of me that wanted to work in industry. I'm about 99% sure that I want to teach, but if a job doesn't come open, I would go to industry.

Belief that "doing a good job" is key to resilience in teaching.

While the majority of the participants were outwardly positive and optimistic about moving into their student teaching experiences, generally their uncertainty paralleled their concern for performing efficaciously. The concern of technical competence related to curriculum was listed by a majority of the participants. One teacher expressed concern over, "being able to give my students accurate information and for them to have confidence in me that I'm teaching them what they need to know to be successful." Initiating and maintaining student motivation

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and engagement were also cause for concern, "Will the students actually pay attention to me [and] sit there long enough, even though I plan on doing a lot of activities?"

Generally, the pre-service student teachers were optimistic about the prospects of their experience in addition to their level of preparation. Optimism as a key to resilience in teaching was poignantly illustrated by one teacher:

> I just think that the want and need to do better and to get better is what helps you stay positive. If you know things aren't going well, it's easy to get down and you just have to realize [you] need to do something different, then you work to do that to see the results.

Discussion

A positive student teaching experience has been linked to the success of a new teacher as the most important experience completed through the teacher development program (Borne & Moss, 1990; Harlin, Edwards, & Breirs, 2002). Aligning with Objectives Two and Four, the preservice teachers often recounted key experiences from youth leading to components of resilience. To encourage conscious thought regarding resilience, teacher educators can integrate reflection on specific prior knowledge of youth experiences in pedagogical content knowledge courses. With an increasing number of non-traditional students entering the agricultural education program at [UNIVERSITY], strength in early field experiences is essential to build these experiences that may be lacking in some students.

In considering Objective One, through experiences and coursework, preservice teachers felt adequately prepared for the content knowledge demands that would be placed on them while teaching in the classroom and laboratory. However, many expressed uncertainty regarding their ability to relate their content knowledge as well as relevant personal experiences to their students in an effective manner consistent with previous findings (Anderson, 2010; Mundt & Connors, 1999). Building a cognitive network in problem solving skills through strengthening the teachers' ability to recall prior experiences and activate previous knowledge is imperative. Is this reflection of experiences in youth unique to agriculture teachers, or would this also be a component of reflection for preservice teachers in other academic disciplines?

Objective Three was addressed in the second theme, as the teachers were found to express concern and uncertainty with questions remaining regarding the reality of the job and even indicated this as a factor that could counter educator resilience. It is imperative that teacher development programs prepare future teachers for the expectations and demands of the profession (Wardlow & Osborne, 2010). This theme supports the notion that earlier and more frequent field experiences are integral to teacher education (Miller & Wilson, 2010). Through authentic experiences early in the program, the teachers have the potential to develop a more global and realistic perception of the job of the agricultural educator. The ultimate implication for this theme is field experiences like student teaching are a vital component of the process of developing perspective on the profession and ultimately determining if agricultural education is a good fit for the individual.

The third theme should inspire teacher educators with hope that students leave our program with a disposition that "doing a good job" for students is essential and is what motivates them to move forward with a career in education. The teacher educators at this institution should reflect on the specific components that emerged as defining a "good job." For consideration is the question of how to best capitalize on this "student-first" thinking that is displayed in the semester prior to student teaching? Do teachers exit student teaching with this same focus on quality and student-first disposition? If these components are parallel to the teacher education program philosophy, it is indicative that students have effectively built a framework that supports this philosophy.

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