Western AAAE
Research Conference Proceedings
2014

American Association for Agricultural Education
Volume 33

September 23-25
Kona, Hawaii

Research Conference Chairs
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Jon Ulmer
Texas Tech University

Poster Chair
Allison Touchstone
University of Idaho
The 2014 Western AAAE Research Conference call for papers was distributed via the AAAE list serve on February 02, 2014. The deadline for submissions was set at April 15th, 2014. Fifty-four manuscripts were submitted for review through the FastTrack system. The blind review process resulted in 27 papers accepted for presentation. All authors were notified of acceptance on June 18th, 2014. The research sessions were held at the Western Region AAAE conference on Wednesday, September 24th, 2014.

The 2014 Western AAAE Research Conference received a total of 38 poster proposals including 24 research posters and 14 innovative posters. Poster proposals were reviewed following conference protocol. Of the submitted posters, 18 poster proposals were accepted including 12 research posters and 6 innovative posters.

The selection process was made possible by the service of John Ricketts, the outgoing AAAE Conference Manuscript Submission and Review Manager, and David Doerfert, the newly elected AAAE Conference Manuscript Submission and Review Manager. Their work providing technical assistance and overseeing the review process using the FastTrack system is greatly appreciated. A special thank you should be extended to the session chairs and facilitators of the research sessions at the 2014 Western AAAE Research Conference as well as the judges who helped select the outstanding research presentation. Finally, thank you to the authors who graciously shared their research to strengthen our profession.
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Thank you to the professional who volunteered their time and expertise in the manuscript review process.

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Elizabeth Wilson        North Carolina State University
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Kattlyn Wolf            University of Idaho
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Lyda García, Texas Tech University

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Gary S. Straquadine, Ohio State University
Lindsay M. Breuler, Ohio State University
Brian K. Warnick, Utah State University
Job Stress, Burnout, and Professional Development Needs as Perceived by Mid-Career Agricultural Education Teachers

Amy R. Smith, University of Minnesota
Scott Smalley, South Dakota State University

Abstract

Retaining high quality secondary agricultural educators is a growing concern across the United States. This study focuses on mid-career agricultural education teachers’ perceptions of job stress, burnout, job satisfaction and professional development needs related to National Quality Program Standards for Secondary Agricultural Education (The National Council for Agricultural Education, 2009). The target population for this study was participants in the 2013 NAAE XLR8 professional development program. Overall, participants indicated highest levels of job stress related to Standard 2 – Experiential Learning and Standard 7 – Program Planning and Evaluation. Participants were least stressed over Standard 6 – Certified Agriculture Teachers and Professional Growth, which also ranked lowest in terms of desired professional development. The most sought after professional development included Standard 2 – Experiential Learning and Standard 1 – Program Planning and Instruction. Findings suggest participants are experiencing “moderate” levels of burnout in each of the three categories measured by the Maslach Burnout Inventory for Educators, however are generally satisfied with their job.

Introduction/Framework

Despite numerous rewards and benefits articulated through anecdotes and personal stories, teaching has been described as one of the most stressful professions of the 21st century (Kyriacou, 2000). In an era of enhanced technology, increased student diversity, decreased funding and high-stakes accountability measures, it should be no surprise that recruitment and retention of teachers is a concern for many. Amidst challenges, educators also face scrutiny from multiple stakeholder groups, each with its own perspectives and expectations (Fullan, 2001; Gulielmi & Tatrow, 1998; Patterson, Collins, & Abbott, 2004).

The nature of secondary agricultural education further complicates this issue. Arguably, a secondary agriculture teacher is expected to fulfill a variety of roles in addition to those of a “typical” classroom teacher. As such, the workload of teachers in agricultural education extends beyond a typical teacher’s workweek (Torres, Lawver & Lambert, 2009). A study by Greiman, Walker and Birkenholz (2005) determined agricultural teachers experience challenges that yield particular job stressors. Efforts to better understanding challenges and stressors may allow teacher educators to better prepare program graduates for expectations of the profession. Failure to address these issues will likely led to decreased career satisfaction and diminish an individual’s willingness or desire to remain in the classroom (Chenevery, Ewing & Whittington, 2008).

With consideration to teacher preparation, challenges and job stress, significant research has been conducted with entry-level, new, or beginning teachers. Often, Moir’s (1990) work
identifying phases of first year teaching is cited as justification for induction or mentoring programs designed to guide new teachers through phases of anticipation, survival, disillusionment, rejuvenation, and reflection. Several studies have explored professional development needs of beginning agriculture teachers, suggesting professional development focused on classroom and behavior management (Joerger, 2002; Joerger & Boettcher, 2000). Additional studies (Edwards & Briers, 1999; Birkenholz & Harbstreit, 1987) also identified needs when working with support groups and preparing for FFA events.

Meeting needs of beginning teachers in agricultural education is an essential consideration when addressing supply and demand issues which plague the profession. However, could it be that others in the profession are being overlooked? Might a gap exist in the support provided to secondary agriculture teachers beyond the induction period? If so, what efforts might assist in meeting the needs of these individuals? Priority three of the American Association of Agricultural Education (AAAE) National Research Agenda addresses the need for “sufficient scientific and professional workforce that addresses the challenges of the 21st century” (Doerfert, 2011, p. 9). Certainly, that challenge supports efforts in secondary agriculture teacher recruitment, preparation and retention. To that end, the framework for this study is based upon agriculture teachers’ stages of career development, or professional life cycle – ultimately seeking greater information about the needs of teachers at all stages or levels.

Outside of agricultural education, various stages of teachers’ professional life cycles have been researched for quite some time (White, 2008). Fessler’s (1985) career cycle model for teachers includes the following stages: pre-service, induction, competency building, enthusiastic and growing, career frustration, stable and stagnant, career wind-down and career exit. Fessler’s model also incorporates two additional considerations – personal environment and organizational environment. Huberman (1989) categorized the life cycle of teachers differently, narrowing them into three primary categories (novice, mid-career and late-career) aligning with five phases: career entry–discovery and survival (1 to 3 years), stabilization (4 to 6 years), experimentation/diversification (7 to 18 years), serenity (19 to 30 years), and disengagement (31 years and beyond). An additional model proposed by Steffy and Wolfe (2001) suggests similar stages, including novice, apprentice, professional, expert, distinguished, and emeritus. As teachers progress through the respective career stages, they either enter a renewal or withdrawal cycle (Steffy & Wolfe, 2001).

To retain teachers and ensure a positive trajectory through the career cycle, opportunities for professional development, support and renewal must be provided. In fact, Steffy and Wolfe’s (2001) model is rooted in transformative learning and emphasizes the importance of the reflection-renewal-growth cycle. Specifically, they offer the following:

One of the basic tenets of transformative learning (Mezirow, 1991, xiii) is that "not so much what happens to people but how they interpret and explain what happens to them that determines their actions, their hopes, their contentment and emotional well-being, and their performance.” … The Life Cycle Model is an application on Mezirow’s transformation theory. As teachers progress throughout their careers, they can engage in transformational processes including critical reflection on practice, redefinition of assumptions and beliefs, and enhanced self worth. Or they can disengage from the work...
environment as a source and stimulation for new learning and begin the gradual decline into professional withdrawal (Steffy & Wolfe, 2001, p. 17).

According to Berman (2004), “Talented teachers will not last long in a culture that undermines or is neutral to their needs and interests, leaves them isolated, or fails to promote their growth” (p. 118). While Berman’s work is focused on recruitment and retention of teachers into a particular school district, multiple applications exist for the agricultural education profession as well. He suggests a “critical period” exists for teachers with 4-6 years of experience, when they decide whether or not to continue in the field of education (2004, p. 133). Earlier and more challenging professional development, the opportunity for leadership roles, and deeper dialogue with colleagues are cited as ways to increase commitment to a school district and profession.

Until recently, many professional development programs in agricultural education have focused on early career teachers. State mentoring or induction programs, regional “new teacher” workshops and the NAAE Teacher Turn the Key program provide excellent resources and support for beginning agricultural educators. However, there appears to be a lack of professional development specifically designed for mid-career agricultural education teachers. In 2013, the National Association of Agricultural Educators (NAAE) recognized the need for professional development in this area and developed an institute called XLR8 to meet the needs of agriculture teachers with 7-15 years of teaching. Research regarding this initiative will better enable state and national leaders and teacher educators to identify and address professional development needs of agricultural educators in this particular stage of the career cycle model, a priority expressed in the American Association of Agricultural Education (AAAE) National Research Agenda (Doerfert, 2011).

**Purpose/Objectives**

The purpose of this study was to describe perceived job stress, burnout, and professional development needs of mid-career agricultural education teachers. The following objectives were identified to guide this research:

1. Describe the demographic characteristics of secondary agriculture teacher participants in the 2013 NAAE XLR8 professional development program.
3. Identify the participants’ perceived needs for professional development and support, as aligned to the National Quality Program Standards for Secondary Agricultural Education.
4. Determine the degree of burnout experienced by agricultural education teachers.
5. Determine the level of job satisfaction of agriculture teachers.

**Methods/Procedures**

The target population consisted of agricultural education teachers with 7-15 years of teaching experience, who had applied for and been accepted into the 2013 NAAE XLR8 professional development program for mid-career teachers (N=20). National Association of Agricultural
Educators staff provided a reliable frame for the study, which consisted of names and contact information for each of the 20 participants. Because of the small number of participants and the ease of contacting them via email to encourage participation, a census was conducted.

An online instrument was developed and distributed via email using Qualtrics. In addition to demographics, the instrument consisted of three primary components: Job Stress and Professional Development Needs based upon the National Quality Program Standards for Secondary Agricultural Education (The National Council for Agricultural Education, 2009), Burnout, and Job Satisfaction. Each of the three components of the online instrument is further outlined below.

**Job Stress and Professional Development Needs (Based Upon NQPS)**

Brewer and McMahan-Landers (2003) noted, “Stress can occur if there is a mismatch between the reality of the work environment and an individual’s perceptions of the work environment” (p.126). Despite best efforts among teacher educators to prepare program graduates, often agriculture teachers comment about stress associated with running an agricultural education program and balancing all necessary components – particularly classroom instruction, FFA and Supervised Agricultural Experiences. However, a total program extends even beyond those three components.

For this study, an agriculture teacher’s self-perceived job stress was sought in the context of the National Quality Program Standards for Secondary Agricultural Education (The National Council for Agricultural Education, 2009). Because of the varied roles and responsibilities expected of an agriculture teacher in providing leadership for a comprehensive agricultural education program, the NQPS were used to focus items in this section of the instrument. The NQPS was created to be a standardized means of evaluating a total agricultural education program, from facilities, to curriculum, to leadership, to marketing. Further, the NQPS can serve as an active evaluation tool for a program, highlighting everything that an “ideal” or “exemplary” agriculture program should offer (National Association of Agricultural Educators, 2010).

In its entirety, the NPQS can overwhelm a secondary agriculture teacher. Therefore, the first section of this instrument was developed using abbreviated Standards Statements (see Table 1) from each of the seven program areas necessary for a high quality, well-balanced secondary agriculture program. XLR8 participants were asked to indicate their level of stress related to each of the program standards (using a rating scale with seven descriptors ranging from “not at all stressed” to “extremely stressed”) and rank the standards in order of professional development needs (1 = standard most want/need addressed through professional development; 7 = standard least want/need addressed through professional development).
Table 1
National Program Quality Standards for Secondary Agricultural Education

<table>
<thead>
<tr>
<th>Standards Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard 1-1: Curriculum &amp; Program Design</strong></td>
</tr>
<tr>
<td>A standards-based curriculum in Agriculture, Food &amp; Natural Resources Systems is delivered through an integrated model that incorporates classroom and laboratory instruction, experiential learning and student leadership &amp; personal development.</td>
</tr>
<tr>
<td><strong>Standard 1-2: Instruction</strong></td>
</tr>
<tr>
<td>Programs promote academic achievement and skill development of all students through year-round instruction.</td>
</tr>
<tr>
<td><strong>Standard 1-3: Facilities &amp; Equipment</strong></td>
</tr>
<tr>
<td>The facilities and equipment support implementation of the program and curriculum by providing all students opportunities for the development and application of knowledge and skills.</td>
</tr>
<tr>
<td><strong>Standard 1-4: Assessment</strong></td>
</tr>
<tr>
<td>Programs utilize multiple methods to assess student learning that illustrates academic achievement and skill development.</td>
</tr>
<tr>
<td><strong>Standard 2: Experiential Learning</strong></td>
</tr>
<tr>
<td>Education is enhanced through active participation by all students in a year-round experiential learning program.</td>
</tr>
<tr>
<td><strong>Standard 3: Leadership Development</strong></td>
</tr>
<tr>
<td>All students participate in year-round intra-curricular agricultural student organization programs and activities.</td>
</tr>
<tr>
<td><strong>Standard 4: School &amp; Community Partnerships</strong></td>
</tr>
<tr>
<td>School and community partners are engaged in developing and supporting a quality program.</td>
</tr>
<tr>
<td><strong>Standard 5: Marketing</strong></td>
</tr>
<tr>
<td>Key stakeholders are continually asked, involved, recognized and informed about all components of the integrated program.</td>
</tr>
<tr>
<td><strong>Standard 6: Certified Agriculture Teachers &amp; Professional Growth</strong></td>
</tr>
<tr>
<td>Competent and technically certified agriculture teachers provide the core of the program.</td>
</tr>
<tr>
<td><strong>Standard 7: Program Planning &amp; Evaluation</strong></td>
</tr>
<tr>
<td>A system of needs assessment and evaluation provides information necessary for continual program development and improvement.</td>
</tr>
</tbody>
</table>

**Burnout**

Researchers have noted teachers who face stress for a period of time may ultimately experience burnout (Troman & Woods, 2001). This condition is often observed in human services areas including education, law enforcement, emergency services and social work. Burnout can result from work overload, lack of fairness in assignments, uneven distribution of rewards, and/or lack of community among staff (Maslach & Jackson, 1981).

The second component of the instrument was Maslach’s Burnout Inventory for Educators (MBI-E). The MBI-E is the predominant instrument used to assess burnout in teachers (Maslach, Jackson, & Schwab, 1996). The rights to utilize this 22-item instrument were purchased from
MindGarden, Inc. because of the instrument’s direct applicability to teachers and its ability to measure three different dimensions of burnout: Personal Accomplishment (PA), Depersonalization (DP), and Emotional Exhaustion (EE). The Personal Accomplishment subscale indicates a teacher’s feelings regarding contributions they make to student growth and achievement, while Depersonalization refers to the attitudes towards one’s students (Maslach et al., 1996). Emotional Exhaustion describes the fatigue that develops when an individual is emotionally drained. Because of its extensive use and commercial availability, validity and reliability have been previously assessed for the MBI-E. Two factor analysis studies conducted between 1981 and 1984 support the use of this instrument (Gold, 1984; Iwanicki & Schwab, 1981). The instrument reported a Cronbach’s alpha reliability ranging from .72 to .90.

**Job Satisfaction**
Cano and Castillo (2004) determined a one-item measure of job satisfaction was a relevant measure of job satisfaction versus a multi-item measure. The researchers “standardized and compared” (Cano & Castillo, 2004, p. 71) the one-item and multi-item instrument and found no differences. It was concluded a one-item measurement can assess job satisfaction adequately. Therefore, job satisfaction was assessed by asking XLR8 participants the following question, “How satisfied are you with your job?” The single-item question required a response on a rating scale with seven descriptors ranging from “strongly dissatisfied” to “strongly satisfied.”

**Data Collection and Analysis**
A modified version Dillman’s (2007) tailored design method was used in developing the descriptive survey design. An initial pre-notice invitation was sent to all XLR8 participants embedded in communication from NAAE staff. A day later, researchers sent an email containing a description of the study, invitation to participate, and a link to the online instrument to each participant. Program participants were asked to complete all portions of the instrument prior to the first session of the XLR8 professional development program. Because of a shortened timeframe for administration of the instrument, only two reminder emails were sent. As a result, 18 of the 20 participants completed all segments of the instrument, providing a 90% response rate. One participant began the instrument, but discontinued because of technology issues. All data were analyzed in SPSS using descriptive statistics, primarily frequencies and percentages.

**Findings**
Through research objective one, researchers sought to describe demographic characteristics of secondary agriculture teacher participants in the 2013 NAAE XLR8 professional development program. In total, 20 teachers participated in the program. Eighteen (90%) provided useable data, although only 17 completed the demographics portion. Of the 17 participants who provided demographic data, 12 were female (71%). Three participants reported being 29 years of age or under, eight were 30-35, 4 were 36-40, and two were 41-45 years of age. Only three of the 17 indicated they were alternatively certified to teach agriculture (ie. post-secondary degree in something other than Agricultural Education, later pursued teacher licensure), with the majority (82%) being traditionally prepared (ie. completed a post-secondary program of study in Agricultural Education and any required licensure exams). Ten participants (59%) reported Master’s degrees, while one reported having completed a Doctorate. Ten participants (59%)
indicated they were currently serving, or had served, in a leadership position with their respective state agriculture teachers’ association.

Objective two was designed to assist researchers in determining level of job stress, as perceived by XLR8 participants, related to each of the program standards outlined by the National Quality Program Standards for Secondary Agricultural Education. Participants were asked to read a description for each standard, then indicate their perceived level of job stress related to the statement. Eight of the ten standard statements yielded means of 4.00 or higher, which suggest participants perceive moderate levels of job stress related to each (Table 2). Two standards had mean scores approaching 4.50; these program standards included Standard 2 – Experiential Learning (M = 4.44, SD = 1.20) and Standard 7 – Program Planning and Evaluation (M = 4.44, SD = 1.15). The program standard participants were least stressed about was Standard 6 – Certified Agricultural Teachers and Professional Growth (M= 2.28, SD = 1.32).

Table 2
Perceived Level of Stress Related to National Quality Program Standards for Secondary Agricultural Education (n=18)

<table>
<thead>
<tr>
<th>Standard</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard 2</td>
<td>Experiential Learning</td>
<td>4.44</td>
</tr>
<tr>
<td>Standard 7</td>
<td>Program Planning &amp; Evaluation</td>
<td>4.44</td>
</tr>
<tr>
<td>Standard 1-1</td>
<td>Curriculum &amp; Program Design</td>
<td>4.17</td>
</tr>
<tr>
<td>Standard 5</td>
<td>Marketing</td>
<td>4.11</td>
</tr>
<tr>
<td>Standard 1-4</td>
<td>Assessment</td>
<td>4.06</td>
</tr>
<tr>
<td>Standard 3</td>
<td>Leadership Development</td>
<td>4.06</td>
</tr>
<tr>
<td>Standard 1-2</td>
<td>Instruction</td>
<td>4.00</td>
</tr>
<tr>
<td>Standard 4</td>
<td>School &amp; Community Partnerships</td>
<td>4.00</td>
</tr>
<tr>
<td>Standard 1-3</td>
<td>Facilities &amp; Equipment</td>
<td>3.28</td>
</tr>
<tr>
<td>Standard 6</td>
<td>Certified Agriculture Teachers &amp; Professional Growth</td>
<td>2.28</td>
</tr>
</tbody>
</table>

*Note. Scale: 1 = Not at all stressed, 4 = Moderately stressed, 7 = Extremely stressed*

Frequencies and percentages related to objective two are provided in Table 3. Standard 6 – Certified Agriculture Teachers and Professional Growth was the standard statement that elicited the highest number of “not at all stressed” responses, with Standard 2 – Experiential Learning receiving the most responses at or above “moderately stressed”. No standards received “extremely stressed” responses from participants.
Table 3
Perceived Level of Stress Related to National Quality Program Standards for Secondary Agricultural Education (n=18)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Not At All Stressed</th>
<th>Moderately Stressed</th>
<th>Extremely Stressed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>Standard 1-1</td>
<td>0</td>
<td>0.00</td>
<td>4</td>
</tr>
<tr>
<td>Standard 1-2</td>
<td>0</td>
<td>0.00</td>
<td>4</td>
</tr>
<tr>
<td>Standard 1-3</td>
<td>2</td>
<td>11.11</td>
<td>5</td>
</tr>
<tr>
<td>Standard 1-4</td>
<td>0</td>
<td>0.00</td>
<td>4</td>
</tr>
<tr>
<td>Standard 2</td>
<td>0</td>
<td>0.00</td>
<td>4</td>
</tr>
<tr>
<td>Standard 3</td>
<td>0</td>
<td>0.00</td>
<td>4</td>
</tr>
<tr>
<td>Standard 4</td>
<td>0</td>
<td>0.00</td>
<td>4</td>
</tr>
<tr>
<td>Standard 5</td>
<td>0</td>
<td>0.00</td>
<td>4</td>
</tr>
<tr>
<td>Standard 6</td>
<td>0</td>
<td>0.00</td>
<td>4</td>
</tr>
</tbody>
</table>

Note. Scale: 1 = Not at all stressed, 4 = Moderately stressed, 7 = Extremely stressed

Through objective three, researchers sought to identify areas from the National Quality Program Standards for Secondary Agricultural Education in which mid-career agriculture teachers most needed and/or wanted professional development. Participants were asked to rank the seven standard areas from 1 to 7, with 1 being the “most wanted/needed” and 7 being the “least wanted/needed” area for professional development. The most commonly indicated standards needed/wanted by XLR8 participants for professional development (Table 4) included Standard 2 – Experiential Learning (M = 3.11, SD = 2.17) and Standard 1 – Program Design and Planning (M = 3.17, SD = 1.72). The least sought after standard for professional development by the participants included Standard 6 – Certified Agriculture Teachers and Professional Growth (M = 6.60, SD = 1.47).

Table 4
Need for Professional Development for National Quality Program Standards for Secondary Agricultural Education (n=18)

<table>
<thead>
<tr>
<th>Standard</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard 2 – Experiential Learning</td>
<td>3.11</td>
<td>2.17</td>
</tr>
<tr>
<td>Standard 1 – Program Design and Instruction</td>
<td>3.17</td>
<td>1.72</td>
</tr>
<tr>
<td>Standard 7 – Program Planning and Evaluation</td>
<td>3.61</td>
<td>1.82</td>
</tr>
<tr>
<td>Standard 4 – School and Community Partnerships</td>
<td>3.67</td>
<td>1.78</td>
</tr>
<tr>
<td>Standard 5 – Marketing</td>
<td>4.11</td>
<td>1.84</td>
</tr>
<tr>
<td>Standard 3 – Leadership Development</td>
<td>4.72</td>
<td>1.84</td>
</tr>
<tr>
<td>Standard 6 – Certified Agriculture Teachers and Professional Growth</td>
<td>6.06</td>
<td>1.47</td>
</tr>
</tbody>
</table>
Frequencies and percentages related to objective three are provided in Table 5. Standard 6 – Certified Agriculture Teachers and Professional Growth ranked as the least preferred area for professional development by eleven of the participants, while Standard 2 – Experiential Learning was the most preferred area for professional development according to seven participants.

Table 5
Need for Professional Development for National Quality Program Standards for Secondary Agricultural Education (n=18)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Most Want/Need Addressed in Professional Development</th>
<th>Least Want/Need Addressed in Professional Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard 1</td>
<td>3 16.67, 4 22.22, 5 27.78</td>
<td>2 11.11, 2 11.11, 1 5.56</td>
</tr>
<tr>
<td>Standard 2</td>
<td>7 38.89, 2 11.11, 1 5.56</td>
<td>3 16.67, 1 5.56, 3 16.67, 1 5.56</td>
</tr>
<tr>
<td>Standard 3</td>
<td>1 5.56, 2 11.11, 1 5.56</td>
<td>4 22.22, 2 11.11, 5 27.78, 3 16.67</td>
</tr>
<tr>
<td>Standard 4</td>
<td>2 11.11, 4 22.22, 2 11.11</td>
<td>4 22.22, 3 16.67, 2 11.11, 1 5.56</td>
</tr>
<tr>
<td>Standard 5</td>
<td>2 11.11, 2 11.11, 3 16.67</td>
<td>1 5.56, 7 38.89, 1 5.56, 2 11.11</td>
</tr>
<tr>
<td>Standard 6</td>
<td>0 0.00, 0 0.00, 2 11.11</td>
<td>2 11.11, 0 0.00, 3 16.67, 11 61.11</td>
</tr>
<tr>
<td>Standard 7</td>
<td>2 11.11, 3 16.67, 6 33.33</td>
<td>1 5.56, 2 11.11, 3 16.67, 1 5.56</td>
</tr>
</tbody>
</table>

With objective four, the researchers sought to identify the degree of teacher burnout experienced by participants of XLR8. Findings suggest that XLR8 participants are experiencing “moderate” levels of burnout in each of the three categories measured by the Maslach Burnout Inventory for Educators, or MBI-E. With consideration given to the interpretation of scores on each construct, the lowest level of burnout was reported on the depersonalization construct, while the highest level of burnout was on the emotional exhaustion construct (Figure 1).

Figure 1. Teacher burnout scale measured by the MBI-E.
Note: Interpretations: 1EE = high (27 or over), moderate (17-26) and low (0-16). 2DP = high (14 or over), moderate (9-13) and low (0-8). 3PA (interpreted in reverse of EE/DP) = low (37 or over), moderate (31-36) and high (0-30).

The fifth and final objective examined the level of overall job satisfaction among XLR8 participants as measured by a single item. Using a seven-point rating scale, where 1 was “strongly dissatisfied” and 7 “strongly satisfied” participants indicated they were generally satisfied with their job (M = 5.28; SD = 1.02).
Conclusions/Recommendations/Implications

This study is based upon a small group of mid-career secondary agricultural education teachers involved in the 2013 NAAE XLR8 professional development program. While participants represented nearly twenty different states spanning all of NAAE regions, the researchers recognize that these results should be interpreted with caution. Findings from this study should not be generalized to all mid-career secondary agriculture teachers. In addition to the limitations due to the size of the population, it is important to note the NAAE XLR8 participants are a unique sub-set of mid-career secondary agriculture teachers. Each participant chose to apply, and ultimately participate, in this professional development opportunity. As such, the stresses, professional development needs, job satisfaction and burnout described may not be consistent with experiences and preferences of teachers who chose not to apply, or participate. Further research is necessary to appropriately determine if findings are indeed representative of the larger population of mid-career agriculture teachers, or if findings for non-XLR8 participants would differ. To meet the needs of all secondary agriculture teachers, regardless career life cycle stage, exploration, research, and dialogue must be continued.

Demographic characteristics of this group did provide some interesting information regarding the profession. Anecdotally, agricultural education leaders have described demographic shifts regarding the gender of new and beginning teachers, having experienced significant growth in the number of female teachers. This group echoed that trend, with nearly three-fourths of XLR8 participants being female. Additionally, the majority of XLR8 participants were traditionally certified, held advanced degrees, and had held or were currently holding leadership positions in state professional organizations. Are these characteristics true of other mid-career agriculture teachers? If so, what does that mean for the profession?

With regard to which standards XLR8 participants perceived as the most stressful, Experiential Learning and Program Planning and Evaluation emerged from the list. This seems consistent with findings from Torres, Ulmer, and Aschenbrener (2008), which examined the distribution of time spent on tasks, roles, and responsibilities of teachers at various stages of a career in agricultural education. They found student teachers, first-year teachers, and experienced teachers spent the largest portion of time in planning and instruction. These two areas consumed over half of teachers’ time. Given that much time is consumed by short-term planning, teachers may be overwhelmed by the idea of program planning and evaluation that is more comprehensive, requires stakeholder engagement, and long-range thinking about program improvement.

Additionally, Torres, Ulmer, and Aschenbrener (2008) found during January and February teachers devoted the highest number of hours to SAEs. They concluded while work with experiential learning (SAEs) may create seasonal increases in time, administrative duties, planning, and instruction are more consistent throughout the year. One might suspect it is within the seasonally high-demand time periods that teacher stress is at its highest. Further, supervision and facilitation of SAEs is a challenging task for teachers. Given the breadth and diversity of student experiences and opportunities for experiential learning, these mid-career teachers may feel underprepared for the task of encouraging “active participation by all students in a year-round experiential learning program” (The National Council for Agricultural Education, 2009).
The standard least stressed about was Certified Agricultural Teachers and Professional Growth. This standard was also ranked lowest in terms of wanted/needed professional development. This is likely because XLR8 participants each had 7 to 15 years of teaching experience and had already fulfilled licensure and certification requirements. As indicated by the demographics, these individuals are seeking opportunities to further develop themselves through advanced education and/or leadership involvement. This is consistent with the experimentation/diversification phase of the career life cycle described by Huberman (1989) and Berman’s (2004) suggestion that challenging professional development, leadership involvement may increase professional commitment. If these participants already have gotten involved in opportunities, they may not feel the need for additional help in this area.

Congruence was found between the most stressful standards and the standards XLR8 participants identified as areas of needed professional development. Experiential Learning and Program Design and Instruction emerged as the two areas in which professional development was most desired. Perhaps these mid-career teachers are at a point in their careers where they are comfortable with the expectations for classroom instruction and leadership development within a complete agricultural education program and are ready to focus additional energy toward experiential learning opportunities. The desire for professional development related to Program Design and Instruction seems consistent with findings by Torres, Ulmer and Aschenbrener (2008) who concluded experienced teachers spend more time on teaching-related activities (e.g., grading, FFA activities, and CDE preparation) and professional activities (e.g., program management, meetings, and in-service). Given that these teachers are all considered mid-career agriculture teachers, they too may have recognized this and are seeking ways to manage, or minimize, this time commitment.

Teachers included in this study are experiencing moderate levels of burnout on each of the three scales of the MBI-E. This is concerning, as it implies these teachers are questioning their contributions to student growth and achievement, may have less than positive attitudes towards ones’ students, and feel emotionally drained (Maslach et al., 1996) to some degree. While none of the findings indicated high levels of burnout, to ensure teacher retention in the profession, efforts must be made to lower these levels further. Previous research conducted by Croom (2003) suggested that agriculture teachers experienced moderate levels of emotional exhaustion, low levels of depersonalization and a high degree of personal accomplishment. How might XLR8 participants have differed from those previously studied, or has something changed in the profession to impact teacher burnout? Kitchel et al. (2012) encouraged further research regarding sources of emotional exhaustion for agriculture teachers and ways to potentially combat teacher burnout.

It was concluded mid-career agriculture teachers who participated in XLR8 are generally satisfied with their job, which is consistent with previous literature regarding job satisfaction among agriculture teachers (Walker, Garton & Kitchel, 2004). While this can be viewed as a positive finding, more research is needed to learn more about improving job satisfaction and minimizing job stress and burnout.

Practical implications abound related to this line of research. First and foremost, administrators, state leaders, and teacher educators should be aware of, and concerned about, job stress, burnout.
and job satisfaction among agriculture teachers. Professional development opportunities related to the National Quality Program Standards for Secondary Agricultural Education should be developed and provided to ensure agriculture teachers are performing at their fullest potential.

While this study only involved a small population of teachers involved in targeted professional development opportunity, what might we learn by seeking this type of information from a broad population of secondary agriculture teachers at various career stages? Certainly, given current supply and demand issues within the profession, it is essential we keep a high proportion of agriculture teachers in the classroom from year to year. In addition, a longitudinal study focusing on this group of mid-career agriculture teachers should be conducted to explore implications of job stress, burnout, and satisfaction related to retention in the profession and to evaluate the benefit and outcomes associated with professional development opportunities related to the National Quality Program Standards for Secondary Agricultural Education.

References


14
Challenges Facing Beginning Agricultural Education Teachers in Idaho as Perceived by Beginning Teachers, Veteran Teachers, and Building Administrators: A Delphi Study

Dr. Allison J. L. Touchstone, University of Idaho

Abstract

The continuing shortage of agricultural education instructors has been documented across the state and nation. Retention of secondary instructors may help reduce the shortage as well as the position changes each year. Identifying the challenges facing beginning teachers as perceived by beginning teachers, veteran teachers, and building administrators can help identify the professional development and mentoring needs to assist in teacher retention. Establishing consensus among the target groups through this Delphi study will allow Idaho Team Ag Ed to be specific and purposeful in long term professional development planning. Through this study, 21 challenge areas were agreed upon by the participants in three areas: Teacher Skills and Knowledge (8); Personal Skills and Professional Development (6); and Program Area Concerns (7). Volume of work was the area of highest concern (n = 92, 90.11%) followed by classroom management skills and classroom teaching experience (n = 81, 89.01%) and 79 of the 91 respondents (86.81%) agreed that finding alternative funding sources were an area of concern followed closely by overall program funding (n = 79 of 90 responses, 87.78%). The consensus supported previous research across the country and will provide a guide for targeted professional development, mentorship, and long-term retention for beginning teachers (0-5 years’ experience) in Idaho.

Introduction

A continuing shortage of agricultural education instructors has been evident across the nation, and specifically within the state of Idaho. In the past 2 years, there has been a 36% change in secondary agricultural education instructor positions within the state ("2014 Initiative for Secondary Agricultural Education Improvement," 2014). Some of these positions have been individuals changing teaching positions within the state, others have been new hires of university trained teachers from both Idaho and surrounding states, while still others have been alternatively (industry) certified personnel.

All of these new instructors face challenges related to teacher skills and knowledge, personal skills, and program concerns. As a result of these challenges, beginning teachers were in need of professional development coursework to prepare and retain their teaching positions (Ruhland & Bremer, 2002). Nationally, research has been conducted regarding beginning teacher challenges for over three decades (Joerger, 2002; Joerger & Boettcher, 2000; Miller & Scheid, 1984; Mundt & Connors, 1999; Nesbitt & Mundt, 1993; Rayfield, McKim, Lawrence, & Stair, 2014; Stair, Warner, & Moore, 2012) and the need for professional development to address those transitional, induction, and mentorship needs. Professional development was defined as learning activities and experiences in which educators participate in order to increase classroom performance (Rhodes, Stokes, & Hampton, 2004). Identifying the professional development needs of beginning teachers as perceived by beginning teachers, veteran teachers and building administrators would provide direction to professional development activities offered at the
district, state, and national levels and aligned directly with both the national Career and Technical Education research agenda (Lambeth, Eliot, & Joerger, 2008) and the AAAE National Research Agenda (Doerfert, 2011) priority area 4 – Meaningful, Engaged Learning in All Environments and priority area 5 – Efficient and Effective Agricultural Education Programs. This study sought to specifically identify the challenges faced by Idaho beginning agricultural education instructors to provide the professional development and mentoring support needed to retain teachers in the secondary classroom, but could be of use as a basis for national studies.

Research has been conducted to identify professional development needs of teachers in career and technical education areas (Boone & Boone, 2007; Rayfield et al., 2014; Wolf, 2011) and specifically beginning teachers in agricultural education (Garton & Chung, 1997; Mundt & Connors, 1999; Nesbitt & Mundt, 1993; Rayfield et al., 2014). Although first year teachers were generally satisfied with their positions (Walker, Garton, & Kitchel, 2004), Joerger (2002) found that managing student behavior, determining curriculum content, and motivating students to learn were the three highest priorities identified by beginning agricultural education instructors. Classroom management, curriculum development, and working with special populations were identified as the highest in-service priority across all career and technical education areas (Ruhland & Bremer, 2002).

School administrators perceived the greatest professional development need of CTE teachers was motivating students to learn, followed by teaching students to think critically and creatively and integration of reading and writing standards into the CTE curriculum (Cannon, Kitchel, Tenuto, & Joki, 2012). The role school administrators play in the development of secondary instructors was key for all content areas and should be included in decisions regarding the enhancement of professional practice (Danielson, 2007). The level of support and understanding provided by the administration and school organization was also a key factor in job satisfaction and stress levels of beginning teachers in Minnesota (Joerger & Boettcher, 2000), and dissatisfaction with administrative support was one of the reasons secondary agricultural education instructors left the profession (Walker et al., 2004).

Assessment of the needs of beginning teachers should be conducted on a regular basis (Joerger, 2002) and information used to design professional development (Joerger, 2002; Mundt & Connors, 1999; Myers, Dyer, & Washburn, 2005). The most recent assessment of beginning teacher induction programs within Idaho was conducted in the late 1990s (Mundt & Connors, 1999) and so the need for new information was critical for effective teacher preparation and retention programs, including professional development.

Theoretical Framework

The theoretical framework for this study was couched in the Herzberg’s Motivational-Hygiene Theory (McClelland, 2014). Herzberg’s hygiene factors address the work and organizational environment and include the organization and its policies, supervision, work conditions, interpersonal relationships, salary, status, and job security. The motivators on the job included achievement, recognition, growth and advancement, as well as the individual’s interest in their job. First year teachers experienced high levels of stress in the first 7 to 8 weeks of classroom instruction (Joerger & Boettcher, 2000), primarily as they adjust to hygiene factors in their
positions. Beginning teachers should be adequately prepared for teaching, but if they are not well equipped to deal with hygiene or motivational factors, these challenges could facilitate a negative experience in the classroom and thereby encourage attrition from the profession.

**Purpose and Objective**

The purpose of this study was to establish consensus regarding the challenges faced by beginning agricultural education instructors in Idaho as perceived by beginning teachers, veteran teachers and building administrators. The objective of the study was to identify challenges faced by beginning agricultural education instructors in order to lay groundwork for long term professional development plans within the state.

**Methods and Procedures**

The Delphi technique was designed as a group communication process which “aims to achieve convergence of opinion on a specific real-world issue” (Hsu & Sandford, 2007) and can be used to seek out information which may “generate a consensus on the part of the respondent group” (Delbecq, Van de Ven, & Gustafson, 1975). The Delphi process was used in the study and modeled after the process described by Hsu & Sandford (2007) to gain consensus on the challenges facing beginning agricultural education instructors. The three groups surveyed were:

1. Beginning agricultural education instructors (0-5 years of experience),
2. Veteran agricultural education instructors (6+ years of experience), and
3. Building administrators.

Beginning instructors would be able to identify their personal challenges in the profession. Veteran teachers could identify with their challenges as new teachers as well as the challenges they could see beginning teachers struggling with as they transition into the classroom. Finally, building administrators may have had a different perception of teaching and learning needs of beginning teachers. Developing consensus provided a common ground for professional development for beginning agricultural education instructors.

Following the Delphi process (Hsu & Sandford, 2007), Round 1 began with an open-ended question which served as the “cornerstone” to gather information from the respondents:

1. What are the greatest challenges facing beginning (0 - 5 years’ experience) agricultural education teachers in Idaho?

In the initial round of the survey, 124 secondary agricultural education instructors and 57 secondary principals with viable email addresses were invited to participate in the study. The population included all secondary agricultural education instructors in the state as well as building level administrators from schools which offered agricultural education programs ("Mailing List and Educational Directory," 2014). Due to changes in administration and availability of contact lists, not all 88 school districts offering agricultural education programs had a current administrator contact available at the time of the study. Reliability of a Delphi study was greater than .80 when the group size was larger than 13 (Dalkey, 1969; Dalkey & Rourke, 1972).
For Round 2, the researcher synthesized the responses from Round 1 into three categories:

1. Teacher Skills and Knowledge – 16 items
2. Personal Skills – 15 items
3. Program Concerns – 19 items

The categorizations were then reviewed by one teacher educator in agricultural education and one faculty member in adult, organizational leadership and learning to assure validity.

The total group was invited to participate in Round 2 and asked to review and rate each item to establish preliminary priorities (Hsu & Sandford, 2007). Respondents were asked to rate their agreement on a 5 point Likert-type scale (1 = Strongly Disagree; 2 = Disagree; 3 = Uncertain; 4 = Agree; 5 = Strongly Agree) with each of the items identified as a challenge for beginning Idaho agricultural education instructors (0-5 years of experience). A 2/3 agreement rate with the statements was identified a priori for items to advance to the final round (Myers et al., 2005).

Round 3 of the survey was sent only to respondents who participated in Round 2 (Hsu & Sandford, 2007) and included only items that had a 2/3 or higher agreement rate as established a priori. For this final round, the categories were narrowed as follows:

1. Teacher Skills and Knowledge – 8 items
2. Personal Skills – 6 items
3. Program Concerns – 7 items

Approximately half of the items from Round 2 advanced to Round 3 based on the agreement of the respondents that the items were challenges facing beginning agricultural education instructors. In a Delphi study, consensus was generally reached by the third round (Hsu & Sandford, 2007).

Results and Findings

Because a census population was used, the findings may be limited to the population of this study. The overall response rate in Round 1 was 60%. In Round 1, the highest response rate was from beginning teachers (69%), followed by veteran agriculture teachers (59%), and finally building administrators (51%). The entire population, with the exception of those who opted out of the study or did not have viable email addresses, was invited to participate in Round 2. In this round, the highest percentage of veteran teachers responded (62%), followed by building administrators (60%) and finally beginning teachers (56%) for a total response rate of all participants of 60%. For the final round, only those that had responded in Round 2 were invited to participate and response rates were higher in all respondent categories. In Round 3, beginning teachers had the highest response rate (95%), followed by veteran teachers (92%), and finally building administrators (78%) with an overall response rate of 88% (Table 1).
Table 1. 
Response Rates by Respondent Type and Survey Round

<table>
<thead>
<tr>
<th>Respondent Type</th>
<th>Round 1</th>
<th>Round 2</th>
<th>Round 3</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Invit</td>
<td>Resp</td>
<td>%</td>
<td>Invit</td>
</tr>
<tr>
<td>Building Admin</td>
<td>57</td>
<td>29</td>
<td>51</td>
<td>53</td>
</tr>
<tr>
<td>Teacher (0-5 yrs.)</td>
<td>36</td>
<td>25</td>
<td>69</td>
<td>34</td>
</tr>
<tr>
<td>Teacher (6 + yrs.)</td>
<td>88</td>
<td>52</td>
<td>59</td>
<td>85</td>
</tr>
<tr>
<td>Total</td>
<td>181</td>
<td>106</td>
<td>60</td>
<td>172</td>
</tr>
</tbody>
</table>

Respondents were asked to provide demographic information in each round of the study to maintain anonymity among rounds. Round 1 Respondents were 75.2% male and 24.8% female which is consistent with the agricultural education instructor population within the state (Idaho division of professional-technical education annual report, 2013) (Table 2).

Table 2. 
Round 1 Respondents by Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Building Administrator</th>
<th>Teacher (0-5 yrs.)</th>
<th>Teacher (6 + yrs.)</th>
<th>Percent (%)</th>
<th>Count (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>24</td>
<td>13</td>
<td>42</td>
<td>75.2</td>
<td>79</td>
</tr>
<tr>
<td>Female</td>
<td>5</td>
<td>12</td>
<td>9</td>
<td>24.8</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>25</td>
<td>51*</td>
<td>100.0</td>
<td>105</td>
</tr>
</tbody>
</table>

*One veteran teacher did not provide this information.

By the final round, respondents had participated in all three rounds of the study. The gender demographics were virtually identical to the first round (75% male and 25% female, Table 3) and were still similar to the state distribution of agricultural education instructors ("Agriculture and natural resources program area history," 2014). No information was readily available regarding the gender distribution of the building administrator population targeted by this study.

Table 3. 
Round 3 Respondents by Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Building Administrator</th>
<th>Teacher (0-5 yrs.)</th>
<th>Teacher (6 + yrs.)</th>
<th>Percent (%)</th>
<th>Count (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>20</td>
<td>8</td>
<td>40</td>
<td>74.7</td>
<td>68</td>
</tr>
<tr>
<td>Female</td>
<td>4</td>
<td>10</td>
<td>9</td>
<td>25.3</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>24*</td>
<td>18</td>
<td>49</td>
<td>100.0</td>
<td>91</td>
</tr>
</tbody>
</table>

*One building administrator did not provide this information.
Participants were also asked to identify their type of certification: university trained and certified or industry/alternatively certified with a limited or standard occupational specialist. In Round 1 (Table 4) as well as Round 3 (Table 5) all of the industry or alternatively certified respondents had 5 years or less of experience in the profession.

Table 4.  
Round 1 Respondents by Certification Type

<table>
<thead>
<tr>
<th>Certification</th>
<th>Building Administrator</th>
<th>Teacher (0-5 yrs.)</th>
<th>Teacher (6+ years)</th>
<th>Percent (%)</th>
<th>Count (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>University</td>
<td>29</td>
<td>17</td>
<td>52</td>
<td>92.5</td>
<td>98</td>
</tr>
<tr>
<td>Industry</td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>7.5</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>25</td>
<td>52</td>
<td>100.0</td>
<td>106</td>
</tr>
</tbody>
</table>

The certification type responses are consistent with the overall industry certification retention rates within the state. Industry certified teachers have not remained in the profession long enough to be classified as veteran teachers ("Agriculture and natural resources program area history," 2014).

Table 5.  
Round 3 Respondents by Certification Type

<table>
<thead>
<tr>
<th>Certification</th>
<th>Building Administrator</th>
<th>Teacher (0-5 yrs.)</th>
<th>Teacher (6+ years)</th>
<th>Percent (%)</th>
<th>Count (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>University</td>
<td>25</td>
<td>15</td>
<td>49</td>
<td>96.7</td>
<td>89</td>
</tr>
<tr>
<td>Industry</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>3.3</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>18</td>
<td>49</td>
<td>100.0</td>
<td>92</td>
</tr>
</tbody>
</table>

The majority of respondents for the final round (58.7%) were from single teacher programs, 23.9% were from two teacher programs, 9.8% from three teacher programs and 7.6% from secondary programs with 4 or more teachers (Table 6).

Table 6.  
Size of Respondent’s Local Programs

<table>
<thead>
<tr>
<th>Number of Teachers in the Local Program</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>One</td>
<td>54</td>
</tr>
<tr>
<td>Two</td>
<td>22</td>
</tr>
<tr>
<td>Three</td>
<td>9</td>
</tr>
<tr>
<td>Four or more</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>92</td>
</tr>
</tbody>
</table>

Most of the respondents indicated their highest level of education as a Bachelor’s Degree (46.7%) followed by a Master’s Degree (45.7%). None of the respondents listed a high school diploma, Associate’s Degree, or Ph.D./Ed.D. as their highest level of education (Table 7).
Table 7.

Highest Degree Earned by Respondents

<table>
<thead>
<tr>
<th>Highest Degree Earned</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>Baccalaureate Degree</td>
<td>43</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>42</td>
</tr>
<tr>
<td>Educational Specialist</td>
<td>7</td>
</tr>
<tr>
<td>HS/AA/PhD/EdD</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>92</td>
</tr>
</tbody>
</table>

In Round 1, the respondents were asked one question: “What are the greatest challenges facing beginning secondary agricultural education instructors?” Of the 181 individuals invited to participate in the study, 106 (60%) responded and identified 50 different challenges in three different categories:

1. Teacher Skills and Knowledge – 16 items
2. Personal Skills – 15 items
3. Program Concerns – 19 items

The responses were categorized by the researcher into major themes to make the subsequent rounds of the study simpler for the respondents to understand.

In Round 2, 104 individuals responded out of the 172 invited (60%). The respondents rated each of the items from Round 1 on a Likert-type scale of 1 (Strongly Disagree) to 5 (Strongly Agree). In the Teacher Skills and Knowledge category, 7 out of 16 received a 2/3 (66%) agreement (Agree + Strongly Agree) to advance on to the third round. The items of highest concern were the amount of classroom experience (86%) held by new teachers followed closely by the classroom management skills of beginning teachers (83%) and the volume of work expected from beginning teachers (79%). In the Personal Skills and Concerns category, 6 out of 15 items rated a 2/3 agreement (66%). Low pay was the highest personal concern overall (82%) with three items following at a 78% agreement: life/work balance, alternative funding sources, and the paperwork expected to be completed by beginning teachers. When considering the Program Concerns category, 7 out of 19 received the required 2/3 (66%) to advance to the next round. Program funding was the highest concern (79%) followed by the program planning capabilities and skills of beginning teachers (76%) and the level of understanding administrators have of the local secondary agricultural education program (75%).

Items from all three categories with a 2/3 (66.6%) agreement rate were passed on to Round 3 to reach consensus. Participants were asked to indicate if they agreed or disagreed with each of the final 21 statements. Again, a 2/3 (66.6%) agreement rate was set a priori to establish consensus (Myers et al., 2005). All 21 of the final items exceeded the consensus level. All respondents (n = 92) were allowed to answer agree or disagree on each of teacher challenges identified in Rounds 1 and 2. When considering Teacher Skills and Knowledge (Table 8), Volume of Work was the item of highest concern (n = 82, 90.11%) followed closely by Classroom Management Skills and Classroom Teaching Experience (n = 81, 89.01%).
Table 8.

*Consensus of Teachers Skills and Knowledge Round 3*

<table>
<thead>
<tr>
<th>Teacher Skills and Knowledge</th>
<th>Agree</th>
<th>Disagree</th>
<th>Total Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$ n $</td>
<td>%</td>
<td>$ n $</td>
</tr>
<tr>
<td>Volume of Work</td>
<td>82</td>
<td>90.11</td>
<td>9</td>
</tr>
<tr>
<td>Classroom Management Skills</td>
<td>81</td>
<td>89.01</td>
<td>10</td>
</tr>
<tr>
<td>Classroom Teaching Experience</td>
<td>81</td>
<td>89.01</td>
<td>10</td>
</tr>
<tr>
<td>Time Management</td>
<td>75</td>
<td>82.42</td>
<td>16</td>
</tr>
<tr>
<td>Communication with Students, Parents, and Colleagues</td>
<td>71</td>
<td>78.02</td>
<td>20</td>
</tr>
<tr>
<td>Teaching Strategies</td>
<td>70</td>
<td>77.78</td>
<td>20</td>
</tr>
<tr>
<td>Working with At Risk/IEP Students</td>
<td>69</td>
<td>75.82</td>
<td>22</td>
</tr>
<tr>
<td>Curriculum Development</td>
<td>67</td>
<td>73.63</td>
<td>24</td>
</tr>
</tbody>
</table>

Knowing where to find alternative funding sources was the item of highest concern ($ n = 79, 86.81\% $) in the personal skills and professional development category. The volume of paperwork required of beginning teachers ($ n = 78, 85.71\% $), dealing with budgets ($ n = 77, 84.44\% $), FFA funding ($ n = 76, 84.44\% $) and low pay received by teachers ($ n = 76, 83.52\% $) were rated closely behind as outlined in Table 9.

The final category was overall concerns with the secondary agricultural education program. Funding was the agreed upon highest concern with 87.78\% of the respondents ($ n = 79 $) agreeing that it was a challenge for beginning teachers. Long term program planning and prioritization followed with 84.44\% of respondents ($ n = 76 $) agreeing that the process was challenging to new teachers. Two topics tied for the third highest challenge ($ n = 70, 77.78\% $): how well local secondary administration understands the agricultural education program and recruiting students into the secondary program. The complete list of program challenges is listed in Table 10.
Table 9.
*Consensus of Personal Skills and Professional Development*

<table>
<thead>
<tr>
<th>Personal Skills and Professional Development</th>
<th>Agree</th>
<th>Disagree</th>
<th>Total Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Alternative Funding Sources</td>
<td>79</td>
<td>86.81</td>
<td>12</td>
</tr>
<tr>
<td>Paperwork</td>
<td>78</td>
<td>85.71</td>
<td>13</td>
</tr>
<tr>
<td>Budgets</td>
<td>77</td>
<td>84.62</td>
<td>14</td>
</tr>
<tr>
<td>FFA Funding</td>
<td>76</td>
<td>84.44</td>
<td>14</td>
</tr>
<tr>
<td>Low Pay</td>
<td>76</td>
<td>83.52</td>
<td>15</td>
</tr>
<tr>
<td>Balancing Life and Work</td>
<td>70</td>
<td>77.78</td>
<td>20</td>
</tr>
</tbody>
</table>

Table 10.
*Consensus of Program Area Concerns*

<table>
<thead>
<tr>
<th>Program Area</th>
<th>Agree</th>
<th>Disagree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Program Funding</td>
<td>79</td>
<td>87.78</td>
<td>11</td>
</tr>
<tr>
<td>Program Planning and Prioritization</td>
<td>76</td>
<td>84.44</td>
<td>14</td>
</tr>
<tr>
<td>Administrative Understanding of Program</td>
<td>70</td>
<td>77.78</td>
<td>20</td>
</tr>
<tr>
<td>Recruiting Students</td>
<td>70</td>
<td>77.78</td>
<td>20</td>
</tr>
<tr>
<td>Common Core Integration</td>
<td>67</td>
<td>74.44</td>
<td>23</td>
</tr>
<tr>
<td>PTE Documents and 10 Forms</td>
<td>65</td>
<td>72.22</td>
<td>25</td>
</tr>
<tr>
<td>Resources</td>
<td>65</td>
<td>73.86</td>
<td>23</td>
</tr>
</tbody>
</table>

**Conclusions/Recommendations/Implications**

By establishing consensus upon challenges facing beginning agricultural education instructors, Team Ag Ed can work toward developing appropriate professional development and mentoring activities to assist in preparing new teachers for successful transition into the classroom. Teacher education programs can also address specific areas of concern in pre-service courses and activities to minimize professional development needed once beginning teachers start in the local secondary program. Additionally, identifying program needs and developing marketing materials for distribution to school, district, community, and administrative stakeholders of the local program could assist beginning and veteran teachers to increase administrators’ knowledge.
of the total agricultural education program. Although specifically focused on beginning teachers in Idaho, these findings could aid other states in identifying professional development needs of teachers beginning their careers in the agricultural education classroom.

Veteran teachers (6+ years’ experience) responded at the highest overall rate (56%) of the three respondent groups while beginning teachers (0-5 years’ experience) demonstrated the lowest overall response rate (44%). Time constraints on the part of the respondents may have played into overall response rates, and veteran teachers may have seen the value of responding to the study more than other response groups. The third round showed the highest response rate, most likely indicating the participants responding were the most interested in the study and its value to the profession. No significant differences in teacher skills and knowledge, personal skills, and program concerns were identified among the groups by either gender or school role.

All of the veteran teachers (n = 49) and building administrators (n = 25), along with 68% (n = 17) of the responding beginning teachers were university certified. All eight of the industry certified respondents were beginning teachers with 5 years or less of experience, and their responses indicated a higher need for FFA and SAE training as well as classroom management and curriculum development than university certified teachers. Industry (alternatively) certified teachers within Idaho have been increasing in numbers in recent years, with only 20% of new teachers being industry teachers in 2008-2009 and 43% in 2013-2014 ("Agricultural Education Directory," 2014). As this trend potentially continues to increase, professional development needs may change to reflect the changing demographic of secondary teachers. Since the majority of respondents (n = 54, 58.7%) were working in single teacher programs, the challenges facing new teachers, coupled with the increase in industry certified teachers, the professional development and mentoring needs and challenges facing these new teachers may drastically change. The self-efficacy of beginning teachers was not assessed in this study and the differentiation between certification types may impact perceived self-efficacy and professional development needs (Robinson & Edwards, 2012) and should be researched further. Continued research is needed to identify beginning teacher challenges so professional development plans may be developed by the stakeholders in Team Ag Ed throughout the nation to increase teacher retention in the secondary classroom (Cannon, Kitchel, & Duncan, 2012).

Several of the items across categories are related to organization of the instructor both in and out of the classroom as factors of the Herzberg Motivational Hygiene Theory (McClelland, 2014) regarding work and organizational environment and supported previous research:

- Volume of work (Mundt & Connors, 1999)
- Time Management (Mundt & Connors, 1999; Myers et al., 2005; Stair et al., 2012)
- Communication (Myers et al., 2005)
- Classroom management skills (Cannon, Kitchel, & Duncan, 2012; Cannon, Kitchel, Tenuto, et al., 2012; Garton & Chung, 1996; Joerger, 2002; Myers et al., 2005; Nesbitt & Mundt, 1993; Robinson & Edwards, 2012; Ruhlans & Bremer, 2002; Stair et al., 2012)
- Paperwork (Stair et al., 2012)
- Budgets (Kitchel, Cannon, & Duncan, 2009)
- Work/life balance (Myers et al., 2005)
- Program planning and prioritization (Garton & Chung, 1996)
State level forms and documents (Garton & Chung, 1996; Kitchel et al., 2009)

Recruiting students to the program (Stair et al., 2012)

Although these items are all addressed in university preparation courses as well as the beginning CTE teacher seminar offered each fall, a two day seminar may not be sufficient to instill skills and strategies necessary to address these challenges in beginning agricultural education instructors. As a result of this study, Team Ag Ed and the College of Education in cooperation with the College of Agricultural and Life Sciences should expand training on the identified skills and strategies as they are taught in the state beginning teacher induction program and the state beginning PTE teacher seminar as well in pre-service teacher education for credit as previously suggested by Moore and Swan (2008) and addressing career motivators for beginning teachers (McClelland, 2014). Similarly, states may need to find additional methods of professional development and mentoring training delivery for beginning teachers and their mentors.

A similar group of items of consensus were noted related to funding of the local secondary program and the FFA at the local level which included: alternative funding sources, FFA and program funding, and program resources. These items were similar to those identified within the business and marketing program area within the state (Kitchel et al., 2009) and Stair, Warner and Moore (2012) as well as directly relating to hygiene factors of work environment (McClelland, 2014). Pre-service teacher education programs should expand their instruction related to funding sources for the local agricultural education programs. Additional professional development workshops should be available during CTE summer conference and as coursework which can be applied toward certification and advanced degrees (Moore & Swan, 2008) in agricultural education. Because the results of this study were similar to results from other program areas (Cannon, Kitchel, & Duncan, 2012; Cannon, Kitchel, Tenuto, et al., 2012; Kitchel et al., 2009), CTE teacher education and in-service training should be coordinated across program areas and offered in collaboration with colleges, universities and professional organizations to meet overall professional development needs of beginning teachers in agricultural education.

Consensus was also reached regarding teaching skills and strategies in agreement with previous research regarding the needs of beginning teachers:

- Teaching strategies
- Working with IEP and at risk students (Cannon, Kitchel, & Duncan, 2012; Myers et al., 2005; Ruhland & Bremer, 2002)
- Curriculum development (Cannon, Kitchel, Tenuto, et al., 2012; Joerger, 2002; Ruhland & Bremer, 2002)
- Common core integration (Cannon, Kitchel, & Duncan, 2012; Cannon, Kitchel, Tenuto, et al., 2012)

Advanced level coursework should also be prioritized for certification and higher level degrees in these identified areas as also recommended by Cannon, Kitchel, & Duncan (2012). Collaborative efforts between the College of Education and the College of Agricultural and Life Sciences could be employed on teaching skills and strategies to continue to meet the professional development needs of agricultural education instructors.
A portion of the topics of consensus were challenges that were difficult to address by the teachers or the teacher education process:

- Classroom teaching experience
- Low pay for teachers
- Administrative understanding of the secondary program (Walker et al., 2004) which was also consistent with Business Education instructors within the state (Kitchel et al., 2009)

Classroom experience simply comes with time. If the professional development needs of the beginning teachers are addressed, teacher retention can be increased, and classroom experience can be gained over time in the school systems. Teacher pay continues to be a concern throughout the educational system nationwide. Activities such as the Idaho 2014 Agricultural Initiative for Secondary Agricultural Education Improvement which passed the state legislature in 2014 can assist in providing expanded resources to secondary agricultural education instructors in the form of incentive grants for highly qualified teachers and start up grants for new secondary programs ("2014 Initiative for Secondary Agricultural Education Improvement," 2014). Team Ag Ed groups within each state should also work with stakeholders to develop informational materials to be used by teachers with administration and strategies to disseminate information to address administrative understanding of the total agricultural education program.

Idaho currently has a beginning teacher induction program in place which has been successful for over 25 years (Moore & Swan, 2008; Mundt & Connors, 1999; Nesbitt & Mundt, 1993). The facilitators of the induction program and pre-service teacher educator training should include specific and detailed mentorship plans to assist in teacher transition and retention. Expanded opportunities should be explored by Team Ag Ed to facilitate and expand the mentorship program. A grant received by the University of Idaho from the Idaho State Department of Education plans to target the areas of professional development identified within this study by all respondents. Similar efforts can be made throughout the nation in response to teacher retention and professional development needs.

Past research has shown the need for targeted professional development that meets the needs of beginning teachers. These professional-development activities could prove useful in increasing the perceived self-efficacy of beginning teachers (Robinson & Edwards, 2012; Wolf, 2011) as well as increasing retention of teachers, regardless of their certification type (Robinson & Edwards, 2012). By including all experience levels of secondary agricultural education teachers as well as building administrators in developing consensus, the perceived needs of multiple populations may be met when developing and conducting successful teacher induction programs. Long term retention of quality teachers may be at least partially dependent on meeting perceived professional development needs of beginning teachers which may also help to address the continued shortage of agricultural educators across the state and, potentially, the nation.

References


An Analysis of the Professional Development Needs of Induction and Non-Induction Phase Agriculture Teachers in Oregon

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Abstract

Agriculture teachers face challenges at every stage of their career, creating a need for professional development to meet their individual needs. Research suggests the need for periodic needs assessments to be conducted within individual states (Washburn, King, Garton, & Harbstreit, 2001). The purpose of this study was to identify and describe, using the Borich needs assessment model, the inservice needs of agriculture teachers in Oregon by career phase. A list of 49 agricultural education competencies were developed from research, and responses were analyzed using mean weighted discrepancy scores (MWDS). We found induction-phase teachers (0-5 years of experience) had the highest inservice needs for the following competencies: (a) writing grant proposals for external funding, (b) utilizing a local advisory committee, and (c) utilizing the AET record book system. Non-induction phase agriculture teachers (6 or more years of experience) were most in need of: (a) balancing priorities to make time for career and family/personal life, (b) utilizing the AET record book system, and (c) utilizing techniques and skills to stay organized. Additionally, differences and similarities between inservice needs of induction and non-induction teachers were identified and discussed. Implications of these findings and recommendations are presented.

Introduction and Need for the Study

Skilled teachers are critical to student achievement (Hargreaves & Fullan, 1992; McCaffrey, Lockwood, Koretz, & Hamilton, 2003). The positive relationship between teacher quality and student success has been corroborated by a number of studies, including research conducted by Kaplan and Owings (2004) which found that as students’ time spent with successful teachers increased, so did their achievement level. Teacher professional development experiences are designed to positively impact behaviors of teachers to improve their effectiveness as educators (Darling-Hammond & Richardson, 2009; Wenglinsky & Silverstein, 2006). Therefore, the need to provide effective professional development is essential for improving student learning.

Teachers possess varying degrees of skills, come from many different programs of preparation, and navigate varied career challenges, creating a need for professional development that is equally varied (Huberman, 1995). Teachers are sometimes offered professional development and inservice by their employers; whether school or local educational agency. Hargreaves and Fullan (1992) found professional development offered at these levels tended to focus on larger, mainstream areas within the curriculum, such as mathematics and English, leaving out the techniques used by teachers of smaller or more focused disciplines. Agricultural education is certainly one of those focused disciplines often overlooked within school based professional development. This leaves agriculture teachers to seek professional development within their
professional associations, the agriculture industry, and from the agriculture teacher education institutions in their state.

The research on what constitutes an effective professional development experience has drawn some varied conclusions. Some studies conclude professional development is best when initiated by individual teachers (Lambert, 1988), while others suggest individual teachers and school officials lack the capacity to plan high quality professional development on their own (Clune, 1991). One conclusion, however, is clear. Individuals likely to be involved in, or affected by, a professional development experience should be the starting point from which programs emerge (Newcomb, McCracken, Warmbrod, & Whittington, 2004; Sofranko & Khan, 1988). In fact, Garton and Chung (1996) found that the perceptions of teacher needs by teacher educators and state supervisors were not consistent with the needs identified by teachers themselves. Therefore, assessing the professional development needs of teachers by involving them in the process is essential, and is the primary goal of this study.

**Literature Review**

“Throughout the careers of teachers, new challenges emerge. Some of these challenges come from changes in the work environment and some from changes in personal needs and conditions” (Fessler & Christensen, 1992, p. 20). These challenges can be particularly shocking for beginning teachers (Maciejewski, 2007). “Entry into the profession is sudden: From one day to the next the beginning teacher has the same responsibility as a teacher with 40 years of service” (Veenman, 1984, p. 167). Therefore, when planning professional development, organizers should consider these challenges, especially the challenges faced by beginning agriculture teachers, and their origins.

A meta-analysis of studies related to challenges faced by beginning teachers across disciplines found the most reoccurring problems were: classroom discipline, motivating students, dealing with individual differences, assessing students’ work, relationships with parents, organization of class work, inadequate teaching materials and supplies, and dealing with problems of individual students (Veenman, 1984). Consistent with findings from the larger education literature (Joiner & Edwards, 2008; McLeskey & Waldron, 2002), Joerger (2002) argued “access to appropriate and timely inservice education activities is critical to the initial success, effectiveness, continued development, and retention of beginning agricultural education teachers” (p. 11).

To develop programs for the professional development of agricultural education teachers, researchers have conducted studies to assess teacher needs. Although different methods have been used to assess the needs of teachers, researchers suggest the Borich (1980) model provides a more robust assessment when compared to more direct assessments (Edwards & Briers, 1999).

While needs assessments are valuable, they can also be arduous and time consuming (Washburn, King, Garton, & Harbstreit, 2001). In an effort the limit the number of needs assessments necessary in a given region, researchers attempted to compare results from neighboring states to see if co-planning was appropriate (Washburn et al., 2001). The researchers concluded that “sufficient differences exist between states to warrant individual periodic needs assessments in each individual state” (p. 408). These differences exist because not only are the teacher education
programs different from state to state, but also the agricultural enterprises and classroom course offerings. Washburn et al. (2001) reinforced this idea “needs assessments should be conducted at regular intervals to accurately reflect the changing needs of teachers, students, and the agriculture, food, fiber, and natural resource industry” (p. 397).

Research also suggests that within a state, specific groups of teachers should be considered differently. Researchers identify that teachers’ work and personal environments change over the course of their careers (Christensen & Fessler, 1992). Therefore, one could assume that agriculture teachers at the beginning of their career differ from experienced teachers regarding their professional development needs. Research supports this notion; Kahler (1974) concluded that beginning teachers within agricultural education were indeed different from their more experienced peers. Birkenholz and Harbstreit (1987) and Myers, Dyer, and Washburn (2005) recommended that focused professional development programs should be used to meet the unique needs of beginning agriculture teachers. With his study of beginning agriculture teachers in Idaho, Mundt (1991) indicated that expecting a beginning teacher to perform as if they were a veteran was unrealistic and that research should be done to determine what can reasonably be expected of beginning teachers. This research supports assessing the needs and providing professional development experiences that are unique to early career agriculture teachers.

Numerous studies have been conducted within agricultural education to specifically identify the needs of beginning teachers, with some of those conducted as needs assessments (Edwards & Briers, 1999; Garton & Chung, 1996; Joerger, 2002; Layfield & Dobbins, 2002), others being direct assessments (Birkenholz & Harbstreit, 1987; Claycomb & Petty, 1983; Kahler, 1974; Miller & Scheid, 1982), Delphi panels (Mundt & Connors, 1999; Myers et al., 2005) or qualitative studies (Boone & Boone, 2007; Mundt, 1991; Talbert, Camp, & Heath-Camp, 1994).

Studies conducted to identify the needs of early career agriculture teachers have identified a consistent need for professional development related to classroom instruction. Three of the most commonly identified early career agriculture teacher needs related to classroom instruction are managing the classroom (Boone & Boone, 2007; Mundt, 1991; Myers et al., 2005), motivating students and maintaining student interest (Farrington, 1980; Joerger, 2002), and the use of technology (Joerger, 2002; Layfield & Dobbins, 2002). Additionally, Farrington (1980) found adapting instruction for students with low academic ability as a need for beginning teachers, while later studies found a need for professional development related to instruction of students with special needs across experience levels (Sorensen, Tarpley, & Warnick, 2005). The task of providing a diverse curriculum has also been identified as one of the top professional development needs among beginning agriculture teachers (Duncan, Ricketts, Peake, & Uesseler, 2006; Miller & Scheid, 1982).

In addition to classroom instruction, research has continually identified professional development needs related to the facilitation of both Supervised Agricultural Experience (SAE) and FFA opportunities. SAE recordkeeping emerged as a need in studies of both beginning teachers (Miller & Schied, 1982) and experienced teachers (Layfield & Dobbins, 2002). In assessments which combined both beginning and experienced teachers, developing student SAE projects was identified as a high professional development need area (Layfield & Dobbins, 2002; Sorensen et al., 2005). Managing the FFA program has also been a consistent need identified by
agricultural education research. Myers et al. (2005) identified organizing and planning FFA events as a need while Layfield and Dobbins (2002) identified specific FFA components like FFA fundraisers and FFA career development event (CDE) team training as needs. Additionally, teachers across experience levels have been found to need support with FFA degree and proficiency applications (Joerger, 2002; Layfield & Dobbins, 2002; Sorensen et al., 2005).

In addition to the traditional aspects of the agriculture teaching profession, FFA, SAE, and classroom instruction, research has identified professional development needs in the broader programmatic context. Research has identified beginning agriculture teachers perceive high professional development needs in managing an advisory board (Joerger, 2002; Myers et al., 2005). Facility management has also been identified as a professional development need for beginning agriculture teachers (Boone & Boone, 2007; Mundt, 1991). Additional programmatic concerns, including the management of young farmer groups and/or adult education programs (Farrington, 1980; Layfield & Dobbins, 2002; Miller & Scheid, 1982) and grant writing (Roberts & Dyer, 2004), have been identified.

Research has also recognized the importance of need areas outside the technical aspects of the agriculture teaching profession. Roberts and Dyer (2004) sought to compare and contrast inservice needs of traditional and alternatively certified teachers of all experience levels, but found that both groups were dealing with stress and time management issues. Furthermore, the skills related to the startup and management of support structures to help agriculture teachers has repeatedly emerged as a professional development need (Joerger, 2002; Layfield & Dobbins, 2002; Myers et al., 2005; Sorensen et al., 2005).

Previous research in agricultural education recommends the specific evaluation of professional development needs for beginning teachers. Therefore, we analyzed the professional development needs of beginning and experienced agriculture teachers in Oregon separately. Additionally, research in agricultural education has identified professional development needs in the areas of instruction, FFA and SAE, program management, and personal (e.g., stress and time) management. Therefore, our comprehensive analysis of the professional development needs for Oregon agriculture teachers included specific items related to each of these need areas.

**Theoretical Framework**

Teacher development is a dynamic process extending throughout a teacher’s career (Fessler, 1992). Beginning in the 1970s, teacher education researchers began to wonder if teacher development occurred in similar phases across teaching careers. The idea was if all teachers traveled through the same career milestones, targeted interventions and developments could be put into place to address challenges and increase retention. These studies of teacher development were sporadic and involved small sample sizes and teachers across a range of experiences and used varied methodologies, however, findings were remarkably similar (McDonald & Elias, 1983). This suggests that problems of teachers cannot simply be attributed solely to the teachers’ characteristics or the workplace environment, but are inherent in the profession of teaching, and that solutions to problems must look at the combination of teacher and environment (Veenman, 1984). It wasn’t until the work of Huberman and Grounauer (1993) with Swiss teachers, Sikes

The model of teacher development created by Fessler and Christensen (1992) guides this study and borrows heavily on social systems theory (see Figure 1). Fessler and Christiansen proposed eight stages, moving from pre-service and induction to career wind-down and exit. However, it is important to note that a teacher’s movement in and between these stages is both dynamic and flexible and that not all teachers enter all stages. Lynn (2002) was clear that the most significant contribution of the Fessler and Christiansen model is the implication that teachers move in and out of career stages in response to personal and organizational environmental conditions.

This model has been used within the agricultural education profession (Greiman, Walker, & Birkenholz, 2005) to investigate the influence of the organizational environment on induction stage teachers. Huberman (1989) indicated teachers would stay in an induction phase for the first one to three years, but, depending on their development, a teacher could be in induction until their sixth year of teaching before moving to career stabilization, or career exit. Teachers who move districts, subjects or grade levels typically respond by re-entering the induction phase.

![Figure 1. Teacher Career Cycle Model from “The teacher career cycle: Understanding and guiding the professional development of teachers” by R. Fessler & J. Christensen (Eds.), 1992, Allyn & Bacon and adapted by Greiman (2010).](image)

According to the teacher career cycle model (Fessler & Christensen, 1992; Greiman, 2010), agriculture teachers of different career stages encounter varying environments and therefore possess varying needs. Consequently, according to Huberman (1995), this creates a need for professional development to meet those various needs. Oregon offers professional development
to agriculture teachers through the teachers’ association at two annual statewide conferences offered during the summer and fall. Additionally, Oregon Team Agricultural Education offers an early career workshop annually for teachers in years one through five of teaching agriculture. This inservice is open to all teachers regardless of preservice training or career experience outside of agriculture. In order to meet the specific needs of agriculture teachers through these various professional development experiences, identification of those needs is essential.

**Purpose/Objectives**

The purpose of this study was to identify and describe the inservice needs of agriculture teachers in Oregon and compare induction phase and non-induction phase teachers by competency and inservice need. This study aims to gather valuable information for determining teacher professional development topics for the various teacher inservice opportunities and to gain a better understanding of inservice needs across career stages. According to Research Priority 4 of the American Association of Agricultural Education National Research Agenda, a primary area of scientific focus is to “Deepen our understanding of effective teaching and learning processes in all agricultural education environments” (Doerfert, 2011, p. 18). Therefore, by determining inservice needs of teachers, effective professional development opportunities can be developed to improve teaching and learning in all agricultural education environments. The following research objectives guided this study:

1. Describe the demographic profile and program characteristics of Oregon agriculture teachers.
2. Identify and prioritize inservice needs by career phase.
3. Identify the inservice needs of the total population of agriculture teachers.

**Methods/Procedures**

The population of this study included all school-based agriculture teachers in Oregon (N = 111) during the 2013-2014 school year. We obtained the names and contact information of agriculture teachers using the 2013-2014 Oregon Agriculture Teacher Directory. In order to reduce frame error, a panel of experts in the field of agricultural education in Oregon scrutinized the information in the directory to insure its accuracy.

We attempted a census of agriculture teachers in Oregon during the 2013-2014 school year, therefore, we make no attempt to generalize beyond the population of this study. The instrument consisted of two parts: agricultural education competencies and demographics. We developed the agricultural education competencies section of the instrument based on the Borich (1980) needs assessment model to assess the perceived ability and importance for each of the competencies. A list of 49 agricultural education competencies were developed from previous research (Boone & Boone, 2007; Duncan et al., 2006; Garton & Chung, 1996; Layfield & Dobbins, 2002; Mundt & Connors, 1999; Myers et al., 2005; Sorensen et al., 2005) and modified to meet the needs of agriculture teachers in Oregon. Teachers were asked to rate their perceived importance and perceived ability for each of the 49 competencies using a five-point Likert-type scale ranging from 1 “very low” to 5 “very high.”
A panel of experts in the field of agricultural education established face and content validity for the instrument. Reliability measures of other needs assessment studies in agricultural education utilized a coefficient of internal consistency for the needs assessment items (Barrick & Doerfert, 1989; Birkenholz & Harbstreit, 1987; Garton & Chung, 1996; Joerger, 2002; Layfield & Dobbins, 2002; McDonald & Lawver, 1997; Sorensen et al., 2005), therefore we determined a coefficient of internal consistency for the 49 agricultural education competencies in the current study. The coefficient of internal consistency was identified, using a Cronbach’s alpha, as .95.

We administered the instrument and collected data in December of 2013 using the online survey program Qualtrics. Using Dillman’s (2007) tailored design method, we made five points of contact with participants to elicit responses. The first point of contact was a notification e-mail, the three subsequent points of contact were e-mails requesting participation in the research study; these were sent at one-week intervals. The final point of contact was a phone-call to individuals who had not yet responded. A total of 80 useable responses were completed, yielding a 72% response rate. There is no attempt to generalize the findings of this study so non-response error was not a concern.

We analyzed the data using the Statistical Package for Social Science (SPSS) version 20. Research objective one was descriptive in nature, therefore we reported the results as frequencies and percentages. To accomplish research objectives two and three, we calculated mean weighted discrepancy scores (MWDS) for each of the 49 agricultural education competencies for the different groups of teachers separately: induction phase teachers (n =27), non-induction phase teachers (n = 53), total teachers (n = 80). For purposes of this study, induction phase teachers were considered to have up to five years of teaching experience. In order to calculate a MWDS we first calculated the discrepancy score for each teacher by subtracting the ability score from the importance score for each agricultural education competency. Then, a weighted discrepancy score was calculated by multiplying the discrepancy score by the mean importance rating for each competency. The MWDS was calculated by taking the sum of the weighted discrepancy scores and dividing them by the number of participant responses for each competency. Finally, using the MWDS, the 49 agricultural education competencies were ranked.

**Results/Findings**

For the first research objective, we sought to describe the demographic profile and program characteristics of Oregon agriculture teachers. The average teacher in Oregon was 38 years old and male (56%). The average number of years teaching was 11, with the median of eight years and the mode of one year. Thirty-six percent (n = 27) of teachers were categorized as induction phase (0-5 years of teaching experience). Fifty-two percent of teachers reported being certified to teach Curriculum for Agricultural Science Education (CASE) content with 27% being certified to teach CASE Plant Science followed by CASE Agriculture, Food, and Natural Resources (19%) and CASE Animal Science (16%), with no teachers being certified in CASE Animal and Plant Biotechnology. Thirty-five percent of the CASE certified teachers were induction phase.

Eighty-four percent of responding teachers were certified to teach agriculture through a university licensure program, while 16% were alternatively certified. The most common class taught in the last five years by agriculture teachers was Introduction to Agriculture (70%), followed by Plant Sciences (68%), Animal Sciences (65%), Agricultural Mechanics (61%),
Agribusiness (36%), Environmental Sciences (31%), and Food Sciences (17%). Respondents’ class sizes ranged from 4-40 students with 21 being the average class size. Teachers reported participating in professional development activities in the past year offered by their school or district (95%), followed by the summer agriculture teacher’s conference (80%), university course offerings (31%), and the National FFA (29%).

Objectives two and three sought to identify and prioritize inservice needs of induction and non-induction phase agriculture teachers as well as for all responding teachers. We used the Borich (1980) needs assessment model to calculate mean weighted discrepancy scores (MWDS) for each of the 49 agricultural education competencies. A higher MWDS indicates a higher need for inservice; additionally each competency is ranked according to inservice need within the reported group (see Table 1).

Table 1

<table>
<thead>
<tr>
<th>Competency</th>
<th>Induction Phase</th>
<th>Non-Induction Phase</th>
<th>Total Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rank MWDS</td>
<td>Rank MWDS</td>
<td>Rank MWDS</td>
</tr>
<tr>
<td>Writing grant proposals for external funding</td>
<td>1</td>
<td>5.93</td>
<td>6</td>
</tr>
<tr>
<td>Utilizing a local advisory committee</td>
<td>2</td>
<td>5.58</td>
<td>8</td>
</tr>
<tr>
<td>Utilizing the AET record book system</td>
<td>3</td>
<td>5.49</td>
<td>2</td>
</tr>
<tr>
<td>Training CDE teams</td>
<td>4</td>
<td>5.11</td>
<td>39</td>
</tr>
<tr>
<td>Balancing priorities to make time for career and family/personal life.</td>
<td>5</td>
<td>5.10</td>
<td>1</td>
</tr>
<tr>
<td>Teaching agricultural mechanics</td>
<td>6</td>
<td>5.09</td>
<td>43</td>
</tr>
<tr>
<td>Managing student SAE record books</td>
<td>7</td>
<td>5.03</td>
<td>9</td>
</tr>
<tr>
<td>Managing the greenhouse</td>
<td>8</td>
<td>4.94</td>
<td>36</td>
</tr>
<tr>
<td>Helping students prepare FFA award applications</td>
<td>9</td>
<td>4.97</td>
<td>27</td>
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<tr>
<td>Managing time effectively</td>
<td>10</td>
<td>4.90</td>
<td>4</td>
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<tr>
<td>Utilizing techniques and skills to stay organized</td>
<td>11</td>
<td>4.78</td>
<td>3</td>
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<tr>
<td>Managing work related stress</td>
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<td>4.62</td>
<td>5</td>
</tr>
<tr>
<td>Utilizing community partners</td>
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<td>4.35</td>
<td>13</td>
</tr>
<tr>
<td>Motivating students to learn</td>
<td>14</td>
<td>3.92</td>
<td>12</td>
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<tr>
<td>Preparing chapter FFA award applications</td>
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<td>3.92</td>
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<tr>
<td>Teaching using experiments</td>
<td>16</td>
<td>3.88</td>
<td>15</td>
</tr>
<tr>
<td>Competency</td>
<td>Induction Phase</td>
<td>Non-Induction Phase</td>
<td>Total Teachers</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>----------------</td>
<td>--------------------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td>Rank</td>
<td>MWDS</td>
<td>Rank</td>
</tr>
<tr>
<td>Maintaining agricultural equipment</td>
<td>17</td>
<td>3.75</td>
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</tr>
<tr>
<td>Evaluating student performance</td>
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<td>3.59</td>
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</tr>
<tr>
<td>Recruiting quality students</td>
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<td>3.54</td>
<td>21</td>
</tr>
<tr>
<td>Developing SAE opportunities for students</td>
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<td>3.50</td>
<td>19</td>
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<td>Determining the content for specific courses</td>
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<tr>
<td>Teaching food science</td>
<td>22</td>
<td>3.36</td>
<td>26</td>
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<tr>
<td>Developing an effective public relations program</td>
<td>23</td>
<td>3.35</td>
<td>10</td>
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<tr>
<td>Organizing fundraising activities</td>
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<td>3.28</td>
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<tr>
<td>Teaching the plant and soil sciences</td>
<td>25</td>
<td>3.26</td>
<td>31</td>
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<tr>
<td>Working with parents</td>
<td>26</td>
<td>3.11</td>
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<tr>
<td>Developing positive community relations</td>
<td>27</td>
<td>3.05</td>
<td>14</td>
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<tr>
<td>Developing effective lesson plans</td>
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<td>3.00</td>
<td>35</td>
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<tr>
<td>Teaching agribusiness</td>
<td>29</td>
<td>2.98</td>
<td>22</td>
</tr>
<tr>
<td>Teaching students problem solving skills</td>
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<td>2.95</td>
<td>16</td>
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<tr>
<td>Developing an FFA program of activities</td>
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<td>2.87</td>
<td>23</td>
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<tr>
<td>Managing student behavior</td>
<td>32</td>
<td>2.87</td>
<td>29</td>
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<tr>
<td>Retaining quality students</td>
<td>33</td>
<td>2.79</td>
<td>18</td>
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<tr>
<td>Teaching in laboratory settings</td>
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<td>2.79</td>
<td>25</td>
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<tr>
<td>Teaching students with learning disabilities</td>
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<td>37</td>
</tr>
<tr>
<td>Working with students for Agriscience fair</td>
<td>36</td>
<td>2.54</td>
<td>20</td>
</tr>
<tr>
<td>Locating instructional resources and materials</td>
<td>37</td>
<td>2.39</td>
<td>11</td>
</tr>
<tr>
<td>Teaching about agriculture’s relationship with the environment</td>
<td>38</td>
<td>2.33</td>
<td>41</td>
</tr>
</tbody>
</table>
Among induction teachers, we found the top five perceived inservice needs to be: writing grant proposals for external funding (5.93), utilizing a local advisory committee (5.58), utilizing the AET record book system (5.49), training CDE teams (5.11), and balancing priorities to make time for career and family/personal life (5.10). Among the non-induction teachers, the top five perceived inservice needs were: balancing priorities to make time for career and family/personal life (6.97), utilizing the AET record book system (6.80), utilizing techniques and skills to stay organized (6.18), managing time effectively (5.98), and managing work related stress (5.81).

Among all responding teachers, we found the top inservice need to be: utilizing the AET record book system (6.37), balancing priorities to make time for career and family/personal life (6.24), utilizing techniques and skills to stay organized (5.69), managing time effectively (5.61), and managing work related stress (5.40).

Objective four sought to compare induction and non-induction teachers by inservice needs. Both groups responded with similar perceived inservice needs for highest and lowest MWDS rankings. Five of the top ten ranked inservice need competencies were shared by both induction and non-induction teacher groups while six out of ten of the bottom ranked competencies were also shared. When comparing induction and non-induction teachers, we found large differences in MWDS for various competencies (see Table 2). Large differences in MWDS indicate large differences when comparing induction teachers to non-induction teachers as it relates inservice needs. Eight of the top ten largest differences involved high inservice needs of induction.
teachers with low needs for non-induction teachers. The competency with the largest MWDS difference between the two teacher groups was teaching agricultural mechanics. Competencies that were high needs for non-induction teachers but low needs for induction teachers included teaching agriscience – integrating science in agriculture and balancing priorities to make time for career and family/personal life.

Table 2

The Ten Largest Differences in MWDS between Teacher Groups

<table>
<thead>
<tr>
<th>Competency</th>
<th>Induction MWDS</th>
<th>Non-Induction MWDS</th>
<th>Difference MWDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching agricultural mechanics</td>
<td>5.09</td>
<td>1.22</td>
<td>3.87</td>
</tr>
<tr>
<td>Training CDE teams</td>
<td>5.11</td>
<td>1.45</td>
<td>3.66</td>
</tr>
<tr>
<td>Managing the greenhouse</td>
<td>4.94</td>
<td>1.66</td>
<td>3.28</td>
</tr>
<tr>
<td>Helping students prepare FFA award applications</td>
<td>4.97</td>
<td>2.07</td>
<td>2.9</td>
</tr>
<tr>
<td>Preparing chapter FFA award applications</td>
<td>3.92</td>
<td>1.44</td>
<td>2.48</td>
</tr>
<tr>
<td>Teaching agriscience – integrating science in agriculture</td>
<td>1.47</td>
<td>3.83</td>
<td>-2.36</td>
</tr>
<tr>
<td>Organizing fundraising activities</td>
<td>3.28</td>
<td>1.27</td>
<td>2.01</td>
</tr>
<tr>
<td>Utilizing a local advisory committee</td>
<td>5.58</td>
<td>3.64</td>
<td>1.94</td>
</tr>
<tr>
<td>Maintaining agricultural equipment</td>
<td>3.75</td>
<td>1.89</td>
<td>1.86</td>
</tr>
<tr>
<td>Balancing priorities to make time for career and family/personal life</td>
<td>5.1</td>
<td>6.87</td>
<td>-1.77</td>
</tr>
</tbody>
</table>

*Note. MWDS = Mean Weighted Discrepancy Score*

Conclusions/Implications/Recommendations

The purpose of this research was to explore the professional development needs of agriculture teachers in Oregon. Additionally, using the teacher career cycle model (Fessler & Christensen, 1992; Greiman, 2010), we sought to compare the professional development needs of teachers in the induction and non-induction phases of their career. By completing this research we sought to provide valuable knowledge with a practical application for inservice development, yet still grounded in a relevant theory.

Four of the top five need areas identified for all responding teachers as well as the non-induction phase teachers (6 or more years of teaching experience) were in areas of personal management, including career and family balance, organization skills, time management, and stress management. These findings support the work of Roberts and Dyer (2004) who also found stress and time management needs were high for agriculture teachers. Teaching agriculture entails a wide variety of job responsibilities, therefore it is no surprise that teachers identified high needs in areas related to managing their time, stress, and balance between career and family responsibilities. Based on these findings, we recommend consideration toward implementing
professional development experiences related to personal management as well as the inclusion of personal management aspects in future assessments of agriculture teachers’ professional development needs.

The top professional development needs for induction phase teachers (0-5 years of teaching experience) did not include such an emphasis on areas of personal management. Induction phase teachers identified higher professional development needs in the more technical aspects of the agriculture teaching profession. Previous research in agricultural education has identified that the induction phase teachers in this study are not alone in their needs for professional development in the technical aspects of the agriculture teaching profession. Specifically, research has identified writing grants (Roberts & Dyer, 2004), using an advisory board (Joerger, 2002; Myers et al., 2005), and managing record books (Miller & Scheid, 1982) – three areas identified in the top five need areas for induction phase teachers in this study – as areas of high professional development need among other populations of agriculture teachers.

In comparing the professional development needs of agriculture teachers in the induction and non-induction career phases, we found a wide array of similarities and differences. For those professional development need areas that were similarly high among both groups, specifically utilizing the AET record book system, balancing priorities to make time for career and family/personal life, writing grant proposals for external funding, utilizing a local advisory committee, and managing student SAE record books, we recommend professional development experiences in Oregon that provide all teachers the opportunity to build their skills in these important areas. Alternatively, those professional development areas with large differences between the induction and non-induction groups, specifically teaching agricultural mechanics, training CDE teams, managing the greenhouse, helping students prepare FFA award applications, and preparing chapter FFA award applications, may be best suited for specific professional development experiences with teachers only in the induction phase.

In addition to the practical implications of the discrepant need areas are the theoretical implications for large perceived differences among induction and non-induction teachers. One important conclusion is, for the five need areas with the largest difference between the two groups, induction phase teachers held a higher perceived need. These findings support the idea that, for these professional development need areas, induction teachers have not yet reached the competency building or enthusiastic and growing teacher stages (Greiman, 2010).

However, a number of professional development areas shared very similar levels of perceived needs among induction and non-induction teachers. Furthermore, a total of 13 of the 49 competencies measured were identified as a higher need among non-induction teachers than induction teachers, with the two largest of these areas being teaching agriscience – integrating science in agriculture and balancing priorities to make time for career and family/personal life. These findings identify that, for certain professional development need areas, additional years of teaching experience do not equate to a lack of professional development needs. In addition to providing specific professional development experiences for induction phase teachers, facilitators should also consider providing professional development experiences for non-induction agriculture teachers based on the specific competencies they identified higher needs in.
This research provided important information regarding the professional development needs of agriculture teachers in Oregon. From a practical standpoint, this study provides valuable information for the consideration of professional development experiences targeted towards different subgroups within the population of agriculture teachers in Oregon. We recommend states consider the value of providing professional development opportunities for teachers in specific career stages and recommend the continued investigation of professional development needs by career stage. Additionally, we recommend research into the potential effectiveness of career specific professional development opportunities.

As we look to the future of agricultural education, we understand the importance of meeting the needs of agriculture teachers through professional development experiences. We also acknowledge the importance of making these professional development experiences tailored to the specific needs of the teachers within those experiences. Therefore, as we consider strategies for optimizing professional development in agricultural education, we recognize the importance of career stage research and the continued use of needs assessments in the agricultural education profession.

References


Exploring Agricultural Communications Students’ Perceptions of Communication Apprehension and Writing Apprehension in the Classroom

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David Roach, Texas Tech University

Abstract

Employers have identified oral and written communications skills to be the most important skills graduates should possess when entering the workforce. In order for faculty to better understand their students’ oral and written communications skills, they should understand what apprehension the students have toward oral and written communications. Communication apprehension (CA) and writing apprehension (WA) pertain to one’s fear, anxiety, or avoidance affecting oral or written communications. Specifically, no studies have been found that explore CA or WA in agricultural communications students. The purpose of this study was to qualitatively explore agricultural communications students’ perceptions of CA and WA. Participants believed agricultural communications instructors set up an environment that is conducive to changing behavior. However, students realized and identified areas of improvement that could help them lower their CA and WA. Recommendations for practice are provided in order to help alleviate CA and WA in agricultural communications students.

Introduction

Early in agricultural communications programs, much emphasis was placed on writing. However, agricultural communications is an ever-evolving degree program due to technological advances in communications, changing agricultural demographics, and external trends (Doerfert & Miller, 2006). Irlbeck and Akers (2009) found that agricultural communications graduates are entering the workforce with a satisfactory skill set in photo editing, page layout, public relations, graphic design, and radio production. However, graduates do not have a satisfactory skill set in writing, photography, news editing, and Web design. Morgan (2012) conducted focus groups with alumni from the University of Georgia to better understand the competencies students in agricultural communications should possess. He found participants emphasized the importance of writing regardless if they went into a career that demanded writing skills or not, which is parallel to findings in other studies (Irlbeck & Akers, 2009; Morgan, 2010; Sprecker & Rudd, 1997; Terry et al., 1994). Another skill set participants deemed important was public speaking skills, which one focus group said was the second most important skill students should possess behind writing (Morgan, 2012). Others have also found public speaking to be an important skill (Morgan, 2010; Terry et al., 1994). Furthermore, Morgan’s (2010) study found verbal communication was the most important communication skill identified by practitioners.

Beyond the agricultural communications discipline, the Association of Public and Land-grant Universities and the University Industry Consortium conducted a study to understand the soft skills needed for new graduates (Crawford et al., 2011). “Soft skills are personal or coping skills
in working with other people that a person needs in order to be successful” (Fernandez, 2003, p. 263). Seven soft skill clusters were developed including communication skills, leadership skills, and professionalism skills. Two descriptive characteristics of the communication skills cluster included effective oral communication and effective written communication. Participants were asked to rank the seven clusters in order of importance. All participants (students, faculty, alumni, and employers) ranked the communication skills cluster as most important. More than half (53.3%) of the employers surveyed ranked the communication skills cluster as the most, or second most, important skills cluster (Crawford et al., 2011). It is important for faculty to teach verbal and written communications skills in order for today’s students to be successful in the workforce. In order to do this, faculty need to understand what apprehension students have toward oral and written communications skills.

**Theoretical and Conceptual Framework**

To understand how instructors can improve students’ verbal and written communications skill sets, social cognitive theory and the concept of self-efficacy should be taken into account. Social cognitive theory is based on the idea that “human functioning is a product of the interplay of intrapersonal influences, the behavior individuals engage in, and the environmental forces that impinge upon them” (Bandura, 2012, p. 11). In the social cognitive view, people are neither driven by inner forces nor automatically shaped and controlled by external stimuli. Rather, human functioning is explained in terms of a model of triadic reciprocity in which behavior, personal factors, and environmental events all operate as interacting determinants of each other (Bandura, 1986, p. 18).

One of the underlying constructs of social cognitive theory is self-efficacy. Self-efficacy is one’s belief in how well one can accomplish something (Bandura, 1994). Schunk (2003) found that “effective learning does not require that efficacy be extremely high” (p. 162). On the same token, Salomon (1984) found that students with high self-efficacy may be overconfident in their abilities and not put out as much effort which negatively affects them. The difficult part is finding the balance. “Self-efficacy beliefs are strengthened by reducing anxiety and depression, building physical strength and stamina, and correcting the misreading of physical and emotional states” (Bandura, 2012, p. 13). The challenge faculty have is being able to help students reduce anxiety and depression in the classroom.

Schunk (1985) developed the model of motivated learning by merging several theoretical perspectives such as social learning, attribution, and instructional psychology. This model includes four general class variables: student characteristics, expectancies, task engagement variables, and efficacy cues. Students have different approaches to learning tasks due to varying aptitudes and experiences. These aptitudes and experiences can influence students’ self-efficacy toward new material, which in turn influences students’ motivation to promote task success and skill development. From task success and skill development, efficacy cues transpire. These efficacy cues are essential to how students measure their performance outcomes and have a great deal of influence on a student’s self-efficacy. This is a reciprocal process because of the interactive relationship between self-efficacy and learning experiences (Schunk, 1985).
It is imperative that instructors’ instructional methods have an effect on both the students’ learning and self-efficacy (Schunk, 2004). Even though a teaching method produces learning, it may not affect self-efficacy, which only hinders the students. Instead, in order for performance accomplishments to occur, it is important for the student to display periods of self-directed mastery in order to practice their skills independently. Researchers (Bouffard-Bouchard, Parent, & Larivee, 1991; Schunk, 2004) reported that when students have high self-efficacy, they perform at increased levels due to their persistence, exhibit less anxiety, and possess higher levels of intrinsic interest.

One way to help students with their self-efficacy in speaking and writing is to understand the degree of communication apprehension (CA) or writing apprehension (WA) they possess. CA and WA pertain to one’s fear, anxiety, or avoidance affecting oral or written communications (Daly & Miller, 1975a; McCroskey, 1977).

CA is a “cognitive response to communication that arouses one internally” (Richmond, Wrench, & McCroskey, 2013, p. 42). The lower CA one has, the less discomfort one feels. CA pertains to one’s ability to orally communicate whether it is one-on-one communication or in front of an audience. Typically, high CA individuals experience discomfort, fright, being unable to cope, and inadequacy (Richmond et al., 2013). Externally, individuals have three behavioral responses: avoidance, withdrawal, and disruption (Bourhis & Allen, 1992; McCroskey, 2011; Richmond et al., 2013). Blume, Baldwin, and Ryan (2013) conducted a study to understand CA and how it affects students’ leadership, adaptability, and multicultural appreciation. What stood out most to them from the results was “how detrimental CA can be to the achievement of important educational outcomes, even among otherwise highly capable students” (Blume et al., 2013, p. 165). If one is fearful, typically one will avoid the situation all together; therefore, he or she will choose to not communicate with others when possible and choose to avoid communicative situations (Richmond et al., 2013). If one has a low willingness to communicate and finds him or herself in a communicative situation, he or she will typically withdraw by either not answering or minimally communicating. When people have disfluencies in verbal speech or nonverbal behaviors they are considered to be disruptive. Examples of a disruptive individual include stuttering, forgetfulness, nail biting, and avoiding eye contact (Richmond et al., 2013).

As discussed earlier, self-efficacy is an important factor to student achievement. Hopf and Colby (1992) found that “CA is more closely related to feelings about one’s ability to accomplish goals than it is to feelings of self-worth” (p. 133). Furthermore, Bourhis and Allen (1992) found a negative relationship existed between CA and cognitive performance. Therefore, CA can be tied to social cognitive theory and self-efficacy and how it affects students in the classroom. When a student possesses CA, it can have a negative impact on their learning (McCroskey, 1977; McCroskey, Booth-Butterfield, & Payne, 1989). Frymier (1993) found a negative relationship between students’ CA and motivation to study – as motivation decreased, CA increased. When instructors have high verbal immediacy, regardless of the student’s CA level, students’ motivation to study was higher (Christophel, 1990; Frymier, 1993). “Teacher immediacy is nonverbal behavior that reduces physical and/or psychological distances between teacher and students” (Reisbeck, 1982, p. 27). When someone exhibits non-verbal immediacy, he or she is likely “to communicate at a close distance, smile, engage in eye contact, use direct body orientation, use overall body movement and gestures, touch others, relax, and be vocally
expressive” (Andersen, 1979, p. 548). In addition, Kelsey (2000) found that high CA students were as interested and motivated by course content as low CA students and enjoyed being in the class but did not want to actively participate in the course. Instead, these students would rather vicariously participate.

Like CA, WA can have an impact on a student’s ability to learn. “Writing well is a major cognitive challenge, because it is at once a test of memory, language, and thinking ability” (Kellogg & Raulerson, 2007). WA is defined as a trait, but the measurement of WA is the reaction to a specific state of encoding of written messages (Daly & Miller, 1975b) and represents a subject-specific disposition (Daly & Wilson, 1983). Daly and Wilson (1983) found WA and general self-esteem, WA and the way people feel about themselves, and WA and feelings of competence to all be significantly and inversely related to each other. Pajares and Johnson (1994) found WA has a strong, negative relationship with writing self-efficacy.

One recommendation of Faigley, Daly, and Witte (1981) was that instructors should use different instructional techniques and materials for high WA students especially since evaluation can play a major role in WA (Smith, 1984). Instead of merely instructing students, instructors should train them as writers (Kellogg & Raulerson, 2007). Training them will help them to effectively utilize their knowledge in order to practice the craft of writing extended texts. Furthermore, students who can practice writing as a professionally relevant task can improve their writing abilities and motivate their learning efforts (Kellogg & Raulerson, 2007).

Mascle (2013) also emphasized the importance of student learning. She suggested that instructors foster conversations and activities in class in order for students to become better writers and to reduce their apprehension. Some examples of classroom activities include writing workshops and reflection journals to contribute to students’ writing self-efficacy. It is important for people to believe they have the power and capability to act in order for them to be actively engaged in the writing process and not simply going through the motions (Pajares, Johnson, & Usher, 2007; Pajares & Valiante, 2008). Writers should also set their own goals in order to ensure progress is the main focus instead of the end product, which will increase their self-efficacy (Bandura, 1997).

Students’ self-efficacy increases when they perceive their instructor in a positive manner (Crumbo, 1999). One way to help students have a positive perception of their instructor is for the instructor to demonstrate faculty support and mentoring (Martinez, Kock, & Cass, 2011) such as paying attention to students’ self-perception of writing competence versus their actual competence of writing (Hackett & Bentz, 1989). Faris, Golen, and Lynch (1999) noted that WA is a significant barrier to the development of written communication skills. Attending to the differences in perception can help reduce apprehension and in turn produce higher efficacious students. “If we can nurture the self-beliefs of our student writers and help them overcome this apprehension, then we can move on to the necessary process of attending to their growth and development as writers” (Mascle, 2013, p. 218).

By faculty knowing their students’ apprehension toward oral and written communications, they can help their students to become more efficacious in those areas and help them to perfect those skill sets in the classroom. Oral and written communications are two of the most important skill
sets employers are looking for; therefore, developing these competencies in students is extremely important for their future career success.

**Purpose**

Research priority area 4 of the National Research Agenda for the American Association for Agricultural Educators is meaningful, engaged learning in all environments (Doerfert, 2011). Within this area, teacher preparation was identified as one of the challenges to overcome in order to provide 21st century students with meaningful, engaged learning environments. Understanding the complex phenomenon of CA and WA in agricultural communications students could have implications for both the students and the instructors. In addition, for instructors specifically, results from this study could aid in understanding how to connect to students with different levels of CA and WA through instructional strategies within major courses. CA and WA have been studied in the communication studies, English, and business disciplines. Specifically, no studies have been found that explore CA or WA in agricultural communications students. Thus, the purpose of this study was to explore and understand the agricultural communications students’ perceptions of communication apprehension and writing apprehension in the classroom. The objective was to identify characteristics students within agricultural communications possess at high, moderate and low levels of communication apprehension and writing apprehension.

**Methods**

A qualitative research design was used for this study in order to gain student perspectives about CA and WA. Stratified purposeful sampling was utilized to identify participants. Stratified purposeful sampling includes utilizing subjects at specific designated points of variation allowing the researcher to develop a better understanding of the characteristics present at each point (Gall, Gall, & Borg, 2007). This study utilized the designated points of variation including high, moderate, and low scores from the Personal Report of Communication Apprehension-24 (PRCA-24) and Writing Apprehension Test-20 (WAT-20) portions from previously collected data from Texas Tech University students who indicated they were willing to participate in a one-on-one interview following a questionnaire (Ahrens, 2014). Eleven participants were identified and agreed to participate in the study.

Semi-structured, one-on-one interviews were used with pre-established questions, but allowed the freedom to ask questions as they emerged during the course of the interview (Glesne, 2011). This type of interviewing also allows questions to be asked out-of-order, ask for clarification, and to ask new questions as deemed appropriate and necessary throughout the course of the interview. A panel of experts reviewed the moderator’s guide with minor revisions made due to their feedback. Interviews were used instead of focus groups because students who have high CA typically do not participate well in small group settings. Thus, one-on-one interviews provided a more comfortable environment for the more apprehensive individuals.

Interviews were audio-recorded, and then transcribed from the one-on-one interviews, and pseudonyms were given to each interviewee. Transcripts were coded and analyzed using the constant comparative method (Glaser & Strauss, 1967) in NVivo 10.0 for Windows. The
constant comparative method allows the researcher “to look for instances that represent the category and to continue looking (and interviewing) until the new information obtained does not provide further insight into the category” (Creswell, 2009, p. 195). To find these categories, we used the method of coding, more specifically open and axial coding. From these codes, we were able to identify themes. Themes “consist of several codes aggregated to form a common idea” (Creswell, 2013, p. 186). The themes were analyzed to explore what perceptions agricultural communications students have about CA and WA in the classroom.

To ensure trustworthiness of the study, credibility, transferability, dependability, and confirmability were the four criterion used (Lincoln & Guba, 1985). For transferability to occur, two strategies were utilized: thick, rich description and purposeful sampling. Credibility was ensured through two strategies: triangulation and member checks. Triangulation was established through the maintenance of a researcher’s journal, field notes and interview transcriptions. Next, member checking was used to ensure themes were accurately portrayed. Creswell (2011) does not take participants transcripts of the interview. Instead, he recommends taking analyses of descriptions or themes from the interviews. Thus, once the data were analyzed, a visual diagram of our interpretations of the findings was created and emailed to participants that asked them to assess the accuracy and credibility of our interpretations. All responses from participants were positive and agreed with our interpretations of the findings and did not find anything missing.

To ensure dependability, we provided an audit trail. Our audit trail consists of raw data (audio-recordings of interviews and field notes), data reduction and analysis products (summaries of field notes in a researcher’s journal), data reconstruction and synthesis products (structure of categories, findings and conclusions that make connections with existing literature), process notes (notes about methodology in the researcher’s journal), materials relating to intentions and dispositions (researcher’s journal), and instrument development information (moderator’s guide) (Lincoln & Guba, 1985). Finally, to ensure confirmability, an audit trail, similar to the dependability audit trail, was established. Furthermore, Lincoln and Guba (1985) propose two other techniques to ensure confirmability, in which we used: triangulation and keeping a reflexive journal (researcher’s journal).

**Findings**

After analyzing the interview transcripts, five major themes emerged. Two of these themes were in vivo coded, which means the codes are “names that are the exact words used by participants” (Creswell, 2013, p. 185).

**Students Enjoy Small Classes**

Small classes are important to participants regardless of their apprehension level. Small classes allow for more one-on-one interaction with the instructor, students can gain a deeper understanding of the material, students can learn from others, and they are more hands-on. Katrina said:

> It’s really just more of a chance for me to grow as a student and in my education whenever the classroom size is smaller. Also, I learn more from the other students in my
class versus classes that I’ve had that aren’t in this college that have lots of people. You don’t really have a chance to hear what the other students have to say.

Similarly, Beth said: “I feel like I get more out of the class. If it’s bigger, then they don’t really care if you’re there or not. It doesn’t seem very important.” Juliette said, “The smaller ones are more intimate and the professor seems to have a better relationship with the students.” Also, Maggie said: “I prefer small lecture courses so we can do more hands-on things. It’s not just a monotony of them talking; it’s a little bit of everything.”

**Group Work is Problematic**

There are good and bad things when it comes to group work, and it really depends as to whether students like group work or not, hence why group work is problematic. Group work can be good because other opinions and points-of-view can be showcased. Abbie said:

> It’s good to have other opinions or other points-of-view. You might do something that you like a certain way and then that way might not always be right for a certain project and so it’s good to have another viewpoint or another aspect to take on something.

On the opposite side, students like to be in control when it comes to their grade. Abbie said:

> I am the type of person that will get it done the week it’s assigned and then do nothing for the whole rest of the semester. Just to make sure I’ve got it done and out of the way and to make sure that instead of having to make sure that everyone’s on the same wavelength you can just know that this is the train of thought I’m thinking. You can just follow it and be done and not have to make sure that everyone’s together.

Group work can be frustrating too. Emily said:

> I think it’s just one of those things that depends. If you have a good group team and you feel like you can get something done, but a lot of times when it’s in school, kids rely on each other and that’s frustrating.

**More Speaking Opportunities**

Students realized that in the agricultural communications degree program at Texas Tech University, they get a lot of practice writing but not a lot of practice speaking. Thus, offering more speaking opportunities emerged as a theme. Practice and agricultural communications public speaking course emerged as subthemes, and within the practice subtheme, several other subthemes emerged: confidence boosters, be silly, conversational, and smaller groups. Furthermore, students recommended that an agricultural communications specific public speaking course be offered and that they can learn from others to become better speakers.

Katrina said:

> I feel with ag comm there hasn’t been a whole lot of opportunities to talk and give presentations. I can think of my communication, speech class, and technical writing we had to give a presentation in and a few other classes, and in campaigns, we had to give presentations. But, if more of them had more where we got up and explained ourselves would help. Just more practice.
Scarlett, Maggie, Juliette, and Beth all said that it is important for instructors to give confidence boosters to help students feel empowered before students are required to give a speech. Juliette said:

I never felt like my [speech] professor was listening or that he thought the message was very important. So, I would say that definitely give the students an emotional boost rather just follow these guidelines. In high school, I had a teacher, and I would definitely give this advice to any professor if they had a student that was anxious about it [giving a speech]. He would tell me this quote. And it’s more, you know, sentimental to me, but it is “Our greatest fear is not that we are inadequate. Our greatest fear is that we are powerful beyond our measure.” And that has been something that when you make a student feel powerful, feel motivational like they hold the power, I think it really helps.

Students’ believed that learning from others could be another way to gain confidence. Emily and Emma talked about different techniques of learning from others. Emily said:

I love watching videos. I think videos are just more and more popular and we get into that and we relate more with videos or seeing other people get up and speak or even to make it funny. When people look stupid up there you’re like, “Oh my gosh, I don’t want to look like that,” so then I think you try harder. Like, I just need to relax.

Emma said:

I think it’s important you just go and listen to other speakers. Once you hear them and you can see the kinds of techniques they use. They might use something like humor to overcome why they’re scared. You just got to find where you’re little bubble is. I think it’s important that you just go watch other people.

One way professors could help give confidence boosts while practicing speaking is to have students be silly. Maggie talked about a previous speech class she was in:

You had to come up with this speech based on some stuff you pulled out of a box, and I think something like that would be really beneficial for someone like in an intro to speaking class, intro to public speaking. I mean just to be able to be kind of silly with it and come up with something off the top of your head cause I feel like a lot of people’s fear of public speaking comes from like I’m not going to remember what I’m going to have to say or they’re going to think that something that I prepared sounds dumb, whereas if you’re having to come up with what you want to say off the top of your head very quickly you’re not thinking about being scared necessarily. You’re thinking about what you have to say.

Furthermore, Claire and Maggie said there should be more conversational type of speaking available because eventually students will be in interviews and even in the jobs they have, being able to have a conversation with someone will be important. Claire said:

You’re going to have to do interviews. That’s one thing that I’ve struggled with is not saying “um” every two seconds or “like” every two seconds. Being able to talk about myself and know exactly what to say which sounds weird, but at the same time your nerves get to you.
Maggie said:
In high school we did these, like it was just a conversation. You’d have a contest where somebody would sit down and you would have to start the conversation. They would give you a topic you kind of had to follow, but the conversation could branch off from that. I feel like that’s mostly the kind of stuff I’m going to have to know in a future career. Not necessarily giving a formal speech over something because that’s not what I’m really interested in. But, you have to be able to go with the flow and hold a conversation and hold the attention of someone.

Lastly, small groups are another idea to help students get a confidence boost while practicing or giving speeches. Abbie talked about a class she was enrolled in:
Doing it, like if you have a large group of like maybe 25 or 30, if you do it in cycles. Have like one person do their presentation in front of a group of five and then add another person from another group and not having the whole audience and then gradually maybe making it bigger throughout the semester isn’t quite as bad.

Claire and Daryl both mentioned the idea of having a public speaking course offered in agricultural communications in order to get more public speaking opportunities. Claire said:
Part of the public speaking class should be learning how to advocate for agriculture. I definitely feel like part of learning how to communicate is learning how to exactly know what to say to people in certain situations. So, we’re taught to write about agriculture, we’re taught to design for agriculture and all this stuff, but we’re not taught to speak for agriculture.

**Grade Them Suckers Hard**
When analyzing the transcripts, grade them suckers hard emerged as an in vivo coded theme. This theme name was selected from something Daryl said when talking about what professors could do to help him overcome any apprehension he had about writing. He said: “Honestly, some of the best advice I’ve gotten is very critical advice. Be very critical of writings. Grade them suckers hard. That’s going to sound bad, but just something like that. Just be very critical of the writings.”

Even if instructors grade papers hard, it is important for them to give constructive criticism in order for the student to learn and grow. Jess suggested constructive criticism should be given with everything that is turned in. Beth said constructive criticism is important because it is not tearing the student down. Emma said it was important to give reinforcement whether it is positive or negative.

Several mentioned that writing workshops should be offered, especially for grammar, spelling, and punctuation (GSP) to help with their writing. Jess said, “The biggest thing for my writing is commas and grammar. Worse thing ever. And it’s always been a problem.” On the same token, students who are not as apprehensive about writing also thought workshops could be helpful. Emily said:

I’m sure a workshop day type to make writing easier [could be beneficial]. Writing, it’s not hard for me, but I don’t enjoy it cause it takes me forever to do. So, I think little
workshops to say don’t stress about writing and break it down so it makes it easier for you to write your piece [could help].

Students in agricultural communications are also required to use Associate Press (AP) Style. Daryl said, “I know AP Style comes out with new updates every year. I mean, I don’t know if maybe a workshop for that, like what’s new to AP [could be beneficial].”

Also, several mentioned the importance of peer reviews and discussions. Emma said: I think it’s important that someone looks over it [paper]. Cause you might read something 50 times and someone might read something once and find five mistakes you didn’t see. I just think it’s important that somebody goes over what you were writing.

Abbie said: Peer reviews and peer discussions are helpful because then you’re not quite as freaking out as when you hand it straight in to a professor. If you have someone else look over it first and maybe get their thoughts and processes maybe it’ll be easier to write on your own and then turn it in to a higher person.

I’m my Worst Enemy
When asked what professors could do to help them overcome their apprehension of speaking and/or writing, several mentioned that it was not necessarily something their professors could help them overcome, but something they had to overcome themselves. Once again, I’m my worst enemy was an in vivo coded theme that emerged from something Daryl said. He said, “With my anxiety of writing, I think I’m my worst enemy because I’m so critical of my writing. I don’t know if my professors could [help]; it’s more of an internal [struggle]. I have to be more confident in myself.”

Scarlett was the one student who had high CA. She labeled herself as shy. She said: “Even though I’m shy, I know that’s something I can work on. I can get over it. I will get over it someday.” She too felt that overcoming her apprehension was something she just had to do on her own. She said, “I feel like that’s just something I have to get over. I feel like I have gotten better over the years, but I think it’s more a personal thing.” She also mentioned that “getting out of your comfort zone definitely helps a lot.”

Maggie reiterated this concept and said, “I think at some point you just kind of like suck it up [and give a speech] and your professor has to tell you it’s OK, your fine, but you still have to perform.” She also said:
You just have to push yourself. I know it’s uncomfortable to speak sometimes and it’s uncomfortable for somebody to critique your writing, but you’re not going to become a better speaker or a better writer unless you have somebody that knows what they’re doing show you how to become better. If that makes sense, and it may be scary and it may be uncomfortable, but you can’t expect to get any better at what you want to do in life if you’re not taking the advice of people that have been there, done that already.
Conclusions and Recommendations

Understanding CA and WA in agricultural communications students is important for faculty so they can tailor instructional techniques as necessary and to help students grow in their oral and written communications skill sets. Overall, agricultural communications students recognize the importance of developing verbal and written communication skills, which have been found to be of importance for graduates to possess (Crawford et al., 2011; Irlbeck & Akers, 2009; Morgan 2010; Morgan, 2012; Terry et al., 1994).

Five themes arose from this study: students enjoy small classes, group work is problematic, more speaking opportunities, grade them suckers hard, and I’m my worst enemy. When classes are smaller, instructors can give students more one-on-one attention. Because of this attention, students are also able to gain a deeper understanding of the course material and feel more comfortable asking questions. This connects to instructors needing to possess high teacher immediacy for students to be more motivated to learn (Christophel, 1990; Frymier, 1993; Messman & Jones-Corley, 2001).

Everyone has different strengths and weaknesses and group work allows for everyone’s strengths to shine. These attributes allow for the group to divide and conquer the assignment or project, which may result in a better grade in the end. Regardless, students prefer to be in control of their grades and not rely on other people to earn or help earn a grade for them. Furthermore, the way in which the assignment or project gets done (method, date, and content) is also something most do not want to give up controlling. Finally, because people may not put forth their best effort, be available to meet, or have the work ethic that others do, group work can be very frustrating.

Students in agricultural communications at Texas Tech University are only required to take one speaking course; however, they are required to take several writing intensive courses. Because of this, students do not believe they get enough practice giving speeches and several proposed the idea of having an agricultural communications public speaking course. This course could not only give students the opportunity to practice more oral communications, but also could give them practice of how to verbally communicate about agriculture.

Building confidence and empowering students to give a speech is very important. One way to help students build confidence is by learning from others whether it be through videos or simply listening to others give speeches. This concept of learning from others ties into self-efficacy and social cognitive theory. Several ways to reach efficacy expectations are through various forms of modeling (Bandura, 1977). By seeing others, students are gaining insight into how they could perform and give a speech; therefore, modeling the behavior they witnessed.

It is important that students learn their mistakes and grow from them instead of an instructor simply telling them that they are right or wrong (Mascle, 2013). “Social cognitive theorists argue that one important source of students’ self-confidence lies in the feedback that students receive from their teachers” (Pajares & Johnson, 1994, p. 327). One major finding that could help increase students’ self-efficacy is to grade students’ work rigorously while also providing constructive criticism. It is one thing to grade a paper and mark it up without leaving comments, but another to mark it up and explain why it is marked up. Furthermore, having in-class peer
reviews and discussions is a way for another set of eyes to see a student’s paper before it gets turned in to the instructor. Peers can also be a springboard to bounce ideas and concepts off of to help with conceptualization. Regardless, having others read over papers is helpful because they may find mistakes that the writer did not find even if it was self-proofread several times. Feedback allows for students to become more efficacious (Bandura, 1977).

Rather than viewing apprehension as something someone can help them overcome, participants viewed apprehension as something they had to overcome themselves. The participants believed it was a personal, internal struggle and in order to overcome apprehension they had to “suck it up” and get out of their comfort zone. Most people must deal with some nervousness in order to get through their apprehension. As students take more control over their life, they are able to shape their environment through cognitive processes (Bandura, 2012).

Behavior can be shaped by environmental influences (Bandura, 2012); therefore, it is important that students are in an environment that can help shape their behavior, ultimately helping to reduce their apprehension. Participants believe that agricultural communications instructors set up an environment that is conducive to changing behavior especially due to the small class size, one-on-one instructor/student relationships, and hands-on activities in the classroom.

These findings provide many recommendations for future practice. Programs should evaluate the courses they offer. If a public speaking course is not being offered, it should be considered. If offering a public speaking course is not an option, then incorporating more oral communications practice into the classroom is important. Participants in this study believed they get a lot of practice writing but not speaking. It is imperative that agricultural communications students be well-rounded and possess both oral and written communication skills, especially since they are important soft skills for graduates to possess (Crawford et al., 2011).

When talking about writing assignments, instructors should strongly consider taking extra time to explain their thoughts and why students were correct or incorrect in their work. Furthermore, the instructors should also encourage peer review and discussion. Extra time might need to be taken in class to help students understand how to provide constructive feedback, but allowing and encouraging peer review and discussion is another way for students to receive feedback before turning in a final version to the instructor. This in turn will allow them to be more confident in the work they submit.

Small classes are imperative to agricultural communications students’ success. Smaller classes allow for more one-on-one conversations with the instructor, students can gain a deeper understanding of the material, students can learn from each other, and more hands-on activities can occur. Students in smaller classes also feel more comfortable asking questions and speaking up during class because of the smaller classroom environment.

Finally, it is vital that instructors give positive reinforcements especially when they are grading. Students are their own worst enemy and a lot of times struggle internally with apprehension they have toward speaking and/or writing. By instructors providing positive reinforcement, this allows students to validate their beliefs that they can accomplish a task or allow them to reassess
their beliefs into thinking they can. When students believe they can – have higher self-efficacy – they will perform better, in turn, submitting higher quality work.

CA and WA are nascent areas of research in the field of agricultural communications. More qualitative and quantitative research should be conducted to better understand CA and WA in agricultural communications students.

References


What’s All the Pinning About? A Descriptive Content Analysis of Agricultural Communications Students’ Pinterest Activity

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Abstract

Pinterest is one of the fastest growing social media sites to date and is currently the fastest growing online content-sharing platform (Delo, 2012; Griswold, 2013; Merrett, 2013). Pinterest’s popularity has drawn attention from a variety of fields, including education and marketing, which see Pinterest as a potentially powerful tool. Few studies have been conducted on the use of Pinterest in the university classroom and none have focused on the specific content students have pinned. To gain a better understanding of what students are pinning, a descriptive content analysis was conducted of the Pinterest activity of agricultural communications students at [University]. Tens of thousands of pins were found in this study with only a small amount of content related to agriculture or agricultural communication courses; however, the variety of information and content available on Pinterest makes it a unique option for students and educators. Researchers recommend that Pinterest be considered by agricultural communications faculty as an addition to course requirements because of its potential as a learning tool, its visual nature, and its potential for marketing. Future research should be conducted to expand the scope of this study to other universities and disciplines so that a broader understanding of Pinterest use by university students can be obtained.

Introduction

Social media has caused a change in society, especially when considering the ways in which people want to consume information (Qualman, 2009). In 2013, 73% of all adult Internet users engaged in social media use of some kind (Brenner, 2013). Internet users age 18-29 were found to be the most likely to use social networking with approximately 83% of users in this demographic participating in social media (Duggan & Brenner, 2013). It is obvious that college-aged students are engaging in social media use, but its use in the academic realm is less widespread.

With more digital natives, students accustomed to the culture of digital technologies are entering university classrooms accustomed to using technology, especially social media (Prensky, 2001). University faculty are faced with the challenge of finding new ways to meet these students’ unique learning styles and must rethink their instructional approaches to deliver information in fresh, new ways that capitalize on what, how, where and when today’s students learn (LaBelle, 2012; Wisniewski, 2010). The learning these students engage in is relevant, real-world, and in many cases, technology-based (Wisniewski, 2010). According to Baird and Fisher (2005), effective and engaging content for today’s students must implement multiple sources of Web-based media, including social media, into the university classroom. A study by Moran, Seaman and Tinti-Kane (2011) found that university faculty have been using social media tools in their courses, both as an element of the course structure as well as an integrated portion of course assignments. Social media provides students with a variety of benefits, including greater student
engagement, greater interest, and students taking more control of and responsibility for their education (Blankenship, 2010).

Pinterest is a social bookmarking site that was launched in 2010 and allows users to share content with others by “pinning” visual content to online boards. Each pin contains a visual element, usually a photo, but may be video, that links to external online sites where the content originated when users, also known as pinners, click on the visual image. Pinners also create captions or descriptions for each pin to make their content searchable by other users. Pins can be originally created from other websites or uploaded content. Pins can be re-pinned from other users. Pinners bookmark items they wish to save by pinning those items to a variety of boards where pins can be categorized however the pinner wishes. Pinterest provides pre-set boards when users create their accounts, but pinners can edit and create new boards to fit their own preferences. Beyond creating and re-pinning content to boards, pinners can like, comment, and tag pins to interact with other pinners.

Pinterest is one of the fastest growing social media sites to date and is currently the fastest growing online content-sharing platform (Delo, 2012; Griswold, 2013; Merrett, 2013). According to the Pew Research Center, in 2012 Pinterest was used by 15% of Internet user compared to Twitter’s 16% and in 2013 grew to 21% surpassing Twitter’s 18% share (Lunden, 2013). Pinterest currently has approximately 70 million users and gains an average of 1.9 billion page views per month (Kuang, 2012; Smith, 2014). It is most popular among the 18-29 and 30-49 age groups (Duggan & Brenner, 2013), making both traditional and non-traditional college students part of the target demographic for the site. The Pew Research Center (2013) also found that women were about five times more likely than men to use Pinterest, marking a greater gender difference than is seen for any other social media site.

The rapid popularity of Pinterest has drawn attention to this social media tool from a variety of audiences, including marketing, public relations, education, and communications professionals. Marketers especially have recognized that Pinterest can become a powerful channel for content marketing (Romeri, 2013). Pinterest not only allows individual users to create and share content, but has also introduced pages for business use allowing companies to visually share their products, services and related content to millions of Pinterest users. As of July 2013, approximately 500,000 Pinterest business accounts existed (Smith, 2014). With so many people, students and communication specialists included, utilizing Pinterest for a variety of activities, it is important that agricultural communications faculty understand how Pinterest is being utilized so they can better implement Pinterest into their curriculum or discussions with students about using social media to market and promote businesses.

Approximately 40% of college students are visual learners (Clarke, Flaherty, & Yankey, 2006; Hanson, Nowlan, & Winter, 2012), making a visual platform such as Pinterest particularly interesting as an educational and marketing tool. Hanson, Nowlan and Winter (2012) stated that Pinterest has great potential for allowing educators to take advantage of the visual aspect of teaching and meeting the needs of their students. Also, with the influx of digitally native students, different approaches to learning must be found. Some educators have found that using Pinterest fosters collaboration between students, especially through the use of group boards when creating and sharing resources (Hanson, Nowlan, & Winter, 2012; Holt, 2012). Utilizing
Pinterest in the classroom provides a new way for students to learn and can improve classroom learning (Holt, 2012). In addition, the agricultural communications student population at [University] is approximately 75% female. With Pinterest being such a female-driven medium, incorporating it into the classroom creates unique learning activities that are embraced by most students (Gibson, Ahrens, & Irlbeck, 2013). Few studies have been conducted on the use of Pinterest in the university classroom and none have been found that focus on the specific content students have pinned making this study an important addition to our understanding of Pinterest use in the university classroom.

**Theoretical Framework**

Katz, Blumler, and Gurevitch (1974) developed the theory of uses and gratifications as a means of explaining how people use media to meet, or gratify, a specific need or goal they have. In this theory, media use is determined by individuals based on the expected ability of the media to satisfy the needs they have (Katz, Blumler, & Gurevitch, 1974). Four major qualifications surround this theory as it pertains to media use: (1) media is sought out by individuals intentionally, (2) media choice is driven by the needs or goals of the individual, (3) media use is capable of satisfying a variety of needs, and (4) individuals select and use media that they feel will best satisfy their needs (Baldwin, Perry, & Moffitt, 2004; Katz, Blumler, & Gurevitch, 1974).

Uses and gratifications can also be used to look at the perceived benefits of using new communications technology, including social media (Baldwin, Perry, & Moffitt, 2004). Several studies have investigated social media tools using the theory of uses and gratifications. Smock, Ellison, Lampe, and Wohn’s (2011) study found that Facebook users were motivated to use the social media outlet because of its relaxing environment, open information sharing, and the opportunity for social interaction. Kaye (2010) found that blogs were used primarily because of their ease and convenience of use and the wide variety of information and opinions that were shared. Social media outlets have brought a new dimension to the theory of uses and gratifications as the use of these media forms have led to the gratification of the use of media as a social environment (Stafford, Stafford, & Schkade, 2004; Sundar & Limperos, 2013). The ability of Pinterest users to share, comment, like, and tag content with other users promotes a social environment in which users can meet their needs of searching and finding content and information, meeting the social needs and wants that have been explored by earlier uses and gratifications research (Baldwin, Perry, & Moffitt, 2004). As new media technologies are introduced to users it becomes increasingly important that those seeking to provide information to the public become aware of the motivations and satisfactions presented to those seeking to be informed.

**Purpose and Objectives**

According to the National Research Agenda Priority Area 2, social science research goals should address “the use of new technologies and social networking tools for communication to selected target audiences” (Doerfert, 2011, p. 17). With a growing number of social media outlets available to and being used by students, it is important that educators understand the motivations behind their social media use, particularly when looking to use this media in the classroom. If
students use social media sites because they satisfy a need vital to their ability to learn, educators can better utilize these tools to promote student learning and engagement in course content. Also, as faculty train future agricultural communicators, ensuring that these students understand how to use popular social media sites is important since sites like Pinterest are becoming an integral part of many organizations’ marketing schemes (Mangold & Faulds, 2009).

This study sought to determine what agricultural communications students are pinning as a first step to better understanding college students’ Pinterest use. The purpose of this study was simply to investigate and describe the frequency and content of agricultural communications students’ pins as a means of helping agricultural communications faculty understand how this social media outlet is utilized by students. The following research objectives were used to guide this study:

1. Determine the frequency/amount of activity pinned by agricultural communications students.
2. Describe the content pinned by agricultural communications students.

Methodology

To achieve the research objectives, researchers conducted a descriptive content analysis of the content pinned by agricultural communications students on Pinterest. Content analysis encompasses “textual analysis that involves comparing, contrasting, and categorizing a corpus of data” (Schwandt, 2007, p. 34) and its methods involve examining any type of document or communication medium, including online media (Gall, Gall, & Borg, 2007). An advantage to using this type of methodology is its ability for making replicable and valid inferences from texts to the contexts of their use (Krippendorff, 2004). A content analysis is an unobtrusive research technique that allows for the analysis of data for the meanings, symbolic qualities, and expressive contents they have and the roles they play for the data’s sources (Krippendorff, 2004).

The target population for this study consisted of agricultural communications undergraduate students at [University]. From this target population, a convenience sample was drawn from which students were selected based on their fit within this study and their availability to the researchers (Gall, Gall, & Borg, 2007; Teddlie & Tashakkori, 2009). The convenience sample consisted of all students enrolled in a senior-level, capstone, agricultural communications course in which Pinterest use was included as a student engagement tool and learning enhancement for the course from three semesters – Fall 2013, Spring 2013, and Fall 2012. A total of 56 students were included in the sample for this study, of which 12 students were male and 44 were female, which is representative of the undergraduate agricultural communications student population at [University].

Since Pinterest is a relatively new form of social media, the researchers were unable to find a similar study on which to base the methodology. Therefore, the researchers based the coding book and methodology off a previous online media analysis (Gibson, Ahrens, Meyers, & Irlbeck, 2012). Prior to data collection, a preliminary coding book was developed by the researchers to aid in the data collection. Having a coding book is important when multiple coders are involved as it allows for consistency within the coding of the data (Creswell, 2009). The initial coding book for this study contained a variety of themes and categories the researchers thought would
be found in the content of the students’ Pinterest boards and outlined initial categories of content students’ pins were categorized in. Several other themes emerged throughout the coding process and were added to the book.

Data collection and analysis was conducted in September and October of 2013. Two researchers examined each student’s Pinterest account looking at each board and the pins within. The researchers began the coding process with a pilot sample of 10 pin boards outside of the sample to establish inter coder reliability. Each researcher coded the boards independently then met to discuss any discrepancies. Once the researchers felt they were consistent in their coding, they coded to the sample. The researchers came together three times throughout the coding process to analyze each others coding procedures, discuss any issues and ensure consistency.

Due to the large amount of pins found from this sample, the researchers coded each student’s pins based on the board they were pinned to. Most boards were clearly labeled and a thorough examination of the pins within each board allowed researchers to determine if the majority of the pins within fit within a specific content category. Boards that had no coherent theme to the pins within were labeled as miscellaneous content.

Using a Microsoft Excel spreadsheet, researchers totaled and entered the number of pins each student’s Pinterest boards displayed for each corresponding category. The researchers looked for categories and themes in the data collected using constant comparative methods, in which content codes were revised throughout data collection to reflect the emerging categories of content found within the data set and to best represent all major categories and themes of content found within the students’ pins. The constant comparative method allows researchers to take information from the data being collected and compare it to existing and emerging categories so that codes can be refined and revised to best represent the data (Creswell, 2013). At the conclusion of data collections, 25 unique categories of content were identified by the researchers. According to Creswell (2013), 25-30 categories or codes of information are sufficient for any size database of collected information. To analyze the data, the researchers calculated descriptive statistics including measure of central tendency, such as the mean, median, and mode, and measures of dispersion, such as standard deviation, to provide further insights on the data.

Limitations

Due to the fact that a convenience sample was used, some sampling error may be present in this study. Only students who were enrolled in one specific class within the past three semesters were selected to be included in the sample. As this course is a senior-level capstone course, only upperclassmen students were included in the study. The exclusion of underclassmen may lead to some error and makes the results of this study applicable to only the students sampled.

Another limitation of this study was the amount of pins under investigation. There were tens of thousands of pins amongst the 56 students investigated in this study. Pins were coded based on the board they were pinned to, which may lead to some error if pins were misplaced within a student’s boards. Also, some boards were found to contain a wide variety of content that was difficult to classify into one category. Such boards were coded as miscellaneous, even though
much of their content could have been sorted into a variety of other categories. It was also important for the researchers to pay close attention to the pins contained within the boards as it was often found that board titles were vague or misleading. This may have led to some misclassification by the researchers if close attention was not paid to the actual pins within each board. This could also have led to some inconsistencies within the data reported.

Finally, the issue of inter-rater reliability may have affected the internal validity of this study. The data for this study was coded by two researchers which could have created an extraneous variable that may have affected the results (Creswell, 2013; Gall, Gall, & Borg, 2007). Even though the researchers collected and coded the data at the same time and place, there may still have been some discrepancies in their actual coding of the content. Both researchers discussed any unclear or possibly problematic items in an effort to bring intercoder agreement to the data being collected (Creswell, 2013). Again, it should be noted that the data gathered through this study is only applicable to the sample from which it was collected and cannot be generalized to a larger population.

Findings

**Determine the frequency/amount of activity pinned by agricultural communications students.**

In total, 63,696 pins and 883 boards were found amongst the 56 students investigated in this study. On average, each student had a total of 1,137 pins (N = 56, SD = 1458.86) and an average of 16 (SD = 12.59) boards on their account. The amount of pinning activity per student varied greatly with total pins ranging from nine to 7,751 pins while the total number of boards per student ranged from one to 70 boards.

The total amount of pins found for all male students (n = 12) was 683 (1.1%) on a total of 45 boards (5.1%). Individually, total pins found for male students ranged from nine pins to 218 pins (M = 56.9, SD =70.19), and total boards ranged from one board to 13 boards (M = 3.8, SD =3.72). For female students (n = 44), a much higher amount of activity was seen. The total amount of pins found for female students was 62,985 (98.9%) on a total of 838 boards (94.9%). Individually, total pins found for female students ranged from 11 pins to 7,751 pins (M = 1,431.5, SD = 1,649.53), and total boards ranged from three boards to 70 boards (M = 19.1, SD = 14.12).

Students in this sample had all completed at least one agricultural communications course that included Pinterest as a learning enhancement and engagement tool. A majority (n = 47, 83.9%) of these students had only one class-related board on their Pinterest account. However, a few students (n = 9, 16.1%) had multiple class boards with one student having as many as four course boards. Course boards were identified as boards containing a course number and/or name in the title (i.e. ACOM 4305 – Ag Comm Campaigns) and were boards set up as group boards in which multiple pinners could pin content to that board.

**Describe the content pinned by agricultural communications students.**

A wide variety of content was found in the pins of the students in this study. Twenty-five unique categories of content were identified by the researchers as part of the coding book developed during this study. Because of the large amount of data under investigation, pins were coded
based on the board they were pinned to. Boards that were found to contain a wide variety of content making them difficult to classify into one category were coded as miscellaneous.

**Most Popular Content**

*Recipes.* The most popular category of content pinned by the students in this study was recipes. In total, 8,863 (13.91%) pins were found to be related to recipes and food content with students (see Table 1). Of the 56 students in this sample, 45 (80.4%) pinned content that was categorized as recipes or food-related topics. Recipe pins consisted of a variety of food types and preparations, some of which were categorized into separate boards by recipe type (desserts, breakfasts, snacks, entrées, side dishes, etc.). The recipe category also included food cooking tips and tricks and links to restaurants and sites where food could be purchased.

Table 1.

*Summary of content pinned by agricultural communications students*

<table>
<thead>
<tr>
<th>Category of Content</th>
<th># pins</th>
<th>% of total pins</th>
<th># of students who pinned content</th>
<th>% of total students with this pin board topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recipes*</td>
<td>8,863</td>
<td>13.91%</td>
<td>45</td>
<td>80.4%</td>
</tr>
<tr>
<td>Fashion*</td>
<td>6,545</td>
<td>10.28%</td>
<td>34</td>
<td>60.7%</td>
</tr>
<tr>
<td>Miscellaneous Pins</td>
<td>6,211</td>
<td>9.75%</td>
<td>39</td>
<td>69.6%</td>
</tr>
<tr>
<td>Home Décor/Building*</td>
<td>6,054</td>
<td>9.50%</td>
<td>42</td>
<td>75.0%</td>
</tr>
<tr>
<td>Humor*</td>
<td>5,364</td>
<td>8.42%</td>
<td>23</td>
<td>41.1%</td>
</tr>
<tr>
<td>Health, Beauty, &amp; Fitness*</td>
<td>4,747</td>
<td>7.45%</td>
<td>36</td>
<td>64.3%</td>
</tr>
<tr>
<td>Quotes</td>
<td>4,379</td>
<td>6.88%</td>
<td>30</td>
<td>53.6%</td>
</tr>
<tr>
<td>Crafts</td>
<td>3,716</td>
<td>5.83%</td>
<td>34</td>
<td>60.7%</td>
</tr>
<tr>
<td>Weddings</td>
<td>3,138</td>
<td>4.93%</td>
<td>28</td>
<td>50.0%</td>
</tr>
<tr>
<td>Communication</td>
<td>2,525</td>
<td>3.96%</td>
<td>30</td>
<td>53.6%</td>
</tr>
<tr>
<td>Holiday</td>
<td>1,100</td>
<td>1.73%</td>
<td>22</td>
<td>39.3%</td>
</tr>
<tr>
<td>Travel</td>
<td>1,026</td>
<td>1.61%</td>
<td>22</td>
<td>39.3%</td>
</tr>
<tr>
<td>Animals</td>
<td>923</td>
<td>1.45%</td>
<td>16</td>
<td>28.6%</td>
</tr>
<tr>
<td>Children</td>
<td>803</td>
<td>1.26%</td>
<td>14</td>
<td>25.0%</td>
</tr>
<tr>
<td>Entertainment</td>
<td>755</td>
<td>1.19%</td>
<td>13</td>
<td>23.2%</td>
</tr>
<tr>
<td>Event Planning/Party Ideas</td>
<td>284</td>
<td>0.45%</td>
<td>12</td>
<td>21.4%</td>
</tr>
<tr>
<td>Job Related</td>
<td>238</td>
<td>0.37%</td>
<td>9</td>
<td>16.1%</td>
</tr>
<tr>
<td>Sports</td>
<td>188</td>
<td>0.30%</td>
<td>7</td>
<td>12.5%</td>
</tr>
<tr>
<td>Gifts</td>
<td>178</td>
<td>0.28%</td>
<td>10</td>
<td>17.9%</td>
</tr>
<tr>
<td>Misc. Tips &amp; Tricks</td>
<td>170</td>
<td>0.27%</td>
<td>9</td>
<td>16.1%</td>
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<tr>
<td>Love**</td>
<td>81</td>
<td>0.13%</td>
<td>4</td>
<td>7.1%</td>
</tr>
<tr>
<td>Agriculture &amp; Nat. Resources**</td>
<td>27</td>
<td>0.04%</td>
<td>5</td>
<td>8.9%</td>
</tr>
<tr>
<td>Religion**</td>
<td>19</td>
<td>0.03%</td>
<td>2</td>
<td>3.6%</td>
</tr>
<tr>
<td>Inspirational People/Stories**</td>
<td>13</td>
<td>0.02%</td>
<td>3</td>
<td>5.4%</td>
</tr>
<tr>
<td>Finance**</td>
<td>6</td>
<td>0.01%</td>
<td>1</td>
<td>1.8%</td>
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</table>

*N = 56, Total number of pins = 63,696

*Note.* * denotes most popular content, ** denotes most unpopular content
Fashion. Slightly fewer pins (6,545, 10.28%) were found to be related to fashion, which was found to be the second most popular category of content pinned by students in this study. Fewer students (n = 34, 60.7%) pinned content that was categorized as fashion compared to recipes. Fashion content constituted a wide range of pins. The researchers found that students pinned individual clothing items and entire clothing ensembles, as well as a large variety of accessories such as shoes, handbags, jewelry, watches, eyewear, and others. Fashion was distinguished from beauty as being clothing or accessories that were worn and could be removed.

Home Décor/Building. The next most popular category of content pinned was home décor/building ideas with 6,054 (9.5%) pins. Seventy-five percent (n = 42) of students pinned home décor/building related content. This category originated as two individual categories, home décor and home building ideas, but was later refined into one category. Pins in this category included home decorating ideas, tips, and tricks, floral arrangements, home décor items and artwork, room arrangement guides, furniture, wallpaper, paint colors, home building plans, renovation ideas, do-it-yourself home improvement projects, and dream home images.

Humor. Humor was another popular category found for pin content with 5,364 (8.42%) total pins. However, less than half (n = 23, 41.1%) of the students in this sample pinned items in this category. In this category, researchers found pins containing memes, a cultural item in the form of an image, video or phrase that is spread via the Internet and often altered in a creative or humorous way (see Figure 1 for an example); greeting card parodies, photos, links to videos and songs, jokes, and other content pinners had labeled as humorous.


Health/Beauty/Fitness. Health, beauty, and fitness related pins accounted for 7.45% (4,747) of all pins found in this study. Thirty-six (64.3%) students in the sample pinned content that fell within this category. This category was combined and refined from three original categories of content to become one category that encompassed all pins related to self-image. Pins in the health/beauty/fitness category contained content including hair tips and tricks, haircut and color ideas, hair styling techniques, makeup and beauty techniques and routines, beauty secrets, links to makeup and beauty items, nail polish, nail art ideas, fitness routines and techniques, fitness goals and inspiration, workout equipment, workout trends, and health tips, tricks and trends.

Least Popular Content

Finance. From the sample used for this study, finance-related items were the least pinned content found. Only six (0.01%) pins were found to be pinned by one student (N = 56, 1.8%) in
Finance pins contained content that included tips on how to pay off debt, advice on how to create and maintain a budget, strategies for building wealth, tips on setting up a bill paying system, and advice for organizing personal financial documents.

**Inspirational People/Stories.** Three students (N = 56, 5.4%) in this sample pinned a total of 13 (0.02 %) pins with content related to inspirational people and stories. Pins in this category included success stories of people overcoming their fears or incredible odds, letters encouraging people to strive for their goals, and videos showing inspirational acts.

**Religion.** Nineteen (0.03%) pins were found that contained content related to religion or religious material. Only two (N = 56, 3.6%) students were found to have pinned religious content in this study. Religious pins included videos with spiritual songs and sermons, scriptures and versus, quotes about religious devotion, and ways to be more devoted to God.

**Agriculture & Natural Resources.** Another unpopular category of content pinned by students in this study included content related to agriculture and natural resources. Five (N = 56, 8.9%) students pinned 27 (0.04%) pins with content related to this category.

**Love.** Love related pins accounted for a total of 81 (0.13%) pins in this study and were pinned by only four (7.1%) of the students in this sample. Love pins included quotes and sayings about love, acts and gifts to show your love, photos and videos that show unconditional love, and relationship tips and advice.

**Content Related to Agricultural Communications**

Four categories identified in this study were found to be directly related to agricultural communications and courses related to this field. These categories included communications, event planning/party ideas, job related items, and agriculture and natural resources.

**Communications.** Communications related content was pinned by 53.6% (n = 30) of the students in this study with a total of 2,525 (3.96%) pins. Communications pins contained content related to a variety of communication aspects including photography tips and tricks, Adobe Creative Suite tricks, tutorials, and shortcuts; marketing strategies; design inspirations, ideas, tips and tricks; social media facts, tips, and strategies; and communication tools, tips, and facts.

**Event Planning/Party Ideas.** Another category of pins that was found to be related to agricultural communications were pins related to event planning and party ideas. Few students (n = 12, 21.4%) pinned content related to this category with only 284 (0.45%) total pins related to event or party planning. Pins in this category included party ideas, tips, and advice; party themes; and event planning advice, tips and inspiration. Event planning is a part of the agricultural communications curriculum at [University].

**Job Related.** Nine students (16.1%) in this sample pinned 238 (0.37%) pins with job related content. Job related pins included interview and job search advice and tips, strategies for succeeding on the job, and work attire ideas and advice.
Agriculture & Natural Resources. Statistics for this section were included in the previous section. Pins related to agriculture and natural resources included advertising campaigns for agriculturally-related products, photos and videos depicting agricultural awareness and support, various aspects of country or farm life, and information and facts about agricultural practices or industries.

Conclusions and Recommendations

This research sought to determine the activity and content agricultural communications students pinned on Pinterest, and for the most part, they are using it for fun, entertainment, and their own personal situations. As shown by Duggan and Brenner (2013), a majority of college-aged students are actively using Pinterest. Although only 4.82% (3,074) of the pins found in this study contained content directly related to agricultural communications courses, Pinterest use by the students in this sample portrayed a wide variety of content in a number of fields of interest. The variety of content available to students and the public via Pinterest presents a unique opportunity for agricultural communicators and the agricultural industry to not only explore and discover relevant content, but to disseminate it as well.

Agriculture and natural resources were found to be one of the least popular categories of content pinned. As agricultural communications faculty, attention should be paid to promoting the agricultural industry on social media sites such as Pinterest as a means of sharing and disseminating knowledge and facts to the general public. As educators, this push could start in the classroom with agricultural communications faculty encouraging students to find, create and/or re-pin agriculture and natural resources-related content on Pinterest as a means of advocating for agriculture.

As suggested by Hanson, Nowlan and Winter (2012) and Holt (2012), Pinterest has the ability to foster collaboration between students and can provide a new way for students to learn and improve their performance in the classroom. At most, one student had four class-related boards, indicating that a few instructors are using Pinterest as either a learning supplement, or possibly even a course requirement. With today’s digitally native students seeking new and creative ways to learn and collaborate with fellow students in their courses, Pinterest may be a valuable tool in engaging students in a way that is relevant and interesting to them. Although Pinterest use is certainly not appropriate for all subjects and course content, its use could be much more widespread. With approximately 40% of college students identified as visual learners (Clarke, Flaherty, & Yankey, 2006; Hanson, Nowlan, & Winter, 2012), Pinterest offers university faculty a unique tool for reaching students in the visual realm in which they thrive. Considerations for using Pinterest as a tool in university courses should be encouraged by agricultural communications faculty.

Female students accounted for 98.9% (62,985) of the total pins and 78.6% (n = 44) of the population from this study. With 80% of all Pinterest users being female (Smith, 2014), these results were found to be fairly representative of the average Pinterest user. Although the results of this study cannot be generalized outside of the sample, it can be noted that Pinterest seems to be quite a bit more appealing to women than men. The five most popular categories of content
pinned by the students in this study, recipes, fashion, home décor/building, humor, and health/beauty/fitness, also seem fairly representative of the mostly female demographic.

The findings of this research are limited to the sample from which data were collected; therefore, further research should be conducted to explore how university students are utilizing Pinterest nationwide. Students at [University] may not represent other university students and their use of Pinterest, so this study should be replicated to include multiple agricultural communications programs across the nation. Additionally, this study should be expanded to include a larger sample of students from all disciplines. The content pinned by the students in this study may show a bias toward content related to their upbringing or interests related to their major, especially when compared to content pinned by students from other disciplines. Replicating this study with a larger sample would allow researchers to have a more thorough understanding of Pinterest use by university students as a whole.

Further research should also be encouraged to explore students’ perceptions of using Pinterest as part of their courses. Gibson, Ahrens, and Irlbeck (2013) found that students in one agricultural communications course held positive perceptions about Pinterest use in their course. It is important for faculty to understand how their students feel about using a particular tool as part of a course to better understand its use as an educational tool.

Another important line of research that should be conducted focuses on the gratifications students experience from using Pinterest, both in and out of the classroom. As suggested by Katz, Blumberg, and Gurevitch (1974), media are selected by individuals based on its expected ability to satisfy the needs they have. Future research could provide insights into the reasons why students use Pinterest for personal and academic reasons and how it helps them obtain goals or needs they have. Gaining this understanding would allow educators, researchers, and marketers to target their own use of Pinterest, as well as the content they share, to better serve the goals and needs of students and the public.

References


An Investigation of Agricultural Crisis Communications via Social Media: 
A Grounded Theory Study

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Courtney Meyers, Texas Tech University
Cindy Akers, Texas Tech University
Peggie Price, Texas Tech University

Abstract

Many crises in the agricultural industry have been reported by the mainstream media in recent years, which hold important implications for the agricultural industry, and how they are handled by the media and related agricultural organizations can have an impact on the public’s perceptions of the industry. The popularity of social media outlets as a venue for disseminating and gathering information and news (Glynn, Huge, & Hoffman 2012; Hermida, 2010) make the use of social media surrounding agriculturally-related crises an important topic to investigate in the field of agricultural communications. A qualitative grounded theory study was conducted to investigate the use of social media tools during an agriculturally-related crisis. Most participants reported that social media was a major component of their communication efforts surrounding each crisis and felt social media was very effective in these situations and had a major impact on their communication efforts. Although no participants reported using a social media strategy or crisis communication plan, they stated a need for such guidelines in the agricultural industry. From the data analyzed in this study, a model and theory for using social media during a crisis situation aimed specifically for use by those in the agricultural industry was developed. This project was funded through the USDA’s Beginning Farmers & Ranchers Project.

Introduction/Review of Literature

Many crises in the agricultural industry have been reported by the mainstream media in recent years, such as the 2011 Listeria outbreak in cantaloupes and the 2013 South Dakota unexpected early blizzard, among others. These crises hold important implications for the agricultural industry, and how they are handled by the media and related agricultural organizations can have an impact on the public’s perceptions of the industry. Due to the rising popularity of social media outlets as a venue for disseminating and gathering information and news (Glynn, Huge, & Hoffman 2012; Hermida, 2010), the use of social media surrounding agriculturally-related crises is an important topic to investigate in the field of agricultural communications.

Crisis communication can help fight a crisis, minimize damages, and protect the organization, stakeholders, and industry from harm (Irlbeck, Jennings, Meyers, Gibson, & Chambers, 2013). Organizations that do not have a crisis communications plan often do nothing in response to a crisis, leaving them vulnerable to the multitude of possible ramifications of the situation (Sandman, 1993). According to Coombs and Holladay (2012), crises create the need for information, and effective crisis communication provides information and knowledge to key stakeholders satisfying their need for information. “Technical advances are transforming how
crisis management professionals and researchers view, interact with, and disseminate information to affected communities in a crisis situation” (Veil, Buehner, & Palenchar, 2011, p.1). Research on utilizing online and social media technologies as an aspect of crisis management has only recently been conducted and is still emerging (Austin, Liu, & Jin, 2012). Much of the research conducted on this subject thus far has focused on the use of blogs or websites and found that audiences seek immediate and in-depth crisis information from online sources (Austin et al., 2012). Further, social media can be used by organizations to identify warning signs that a crisis is developing, allowing them to inform the public and share news on the crisis before the media takes control (Coombs, 2008).

A Pew Internet study found that almost three-fourths (73%) of online adults are using some kind social networking site (Duggan & Smith, 2013), which offer unique opportunities to organizations looking to communicate and reach out to audiences via crisis communication (Wright & Hinson, 2009). Liu, Jin, Briones, and Kuch (2012) stated that social media has become “a cultural phenomenon that has changed how all organizations manage crises online” (p. 354), and Currie (2009) commented that, “the time is fast approaching when ‘social’ media will simply become ‘media’” (p. 14). According to Coombs (2008), social media has the potential to become a pivotal aspect of crisis communications, not only in identifying when and how a crisis is developing, but also in sending messages during a crisis. These messages are not only sent by the organizations to distribute information about the crisis, but also in response to comments and questions from the public. The interactive and “social” nature of social media allows the public to become part of the actual crisis response and provides an avenue through which news of crisis events can be shared with millions of people almost instantaneously and without the presence of journalists (Veil et al., 2011). Coombs (2008) also suggested that social media monitoring of crisis response and post-crisis phases should also be utilized as a means of checking the effectiveness of crisis management efforts and how they are being received by the public.

Irlbeck et al. (2013) found that public relations practitioners in the agricultural industry believed it was necessary for their organization to take action immediately if a crisis struck, with or without a crisis communication plan in place. Social media’s ability to deliver instantaneous messages to a vast audience makes its use in crisis communications invaluable to organizations undergoing a crisis. Palmer, Irlbeck, Meyers, and Chambers (2013) stated that those within the food and agriculture industries should seek media outlets through which they can provide consumers with their messages as these tools provide a venue for communicating directly with consumers, foregoing the mass media’s help, especially during times of crisis.

Social media has the potential to have a direct or indirect impact on audiences during a crisis situation, especially as journalists increasingly turn to social media for news generation (Austin et al., 2012; GWU & Cision, 2009). The emergence of social media as a major source for news and information gathering in recent years provides communicators with an opportunity to improve their communication with stakeholders surrounding a crisis. As one communication professional explained regarding the 2009 Salmonella outbreak in peanuts, “I look back and it wasn’t that long ago, but you think about the difference of social media now and social media then, and its huge. The difference now is social media” (Irlbeck et al., 2013, p. 27).
According to the National Research Agenda, Priority Area 2, social science research goals need to address “the use of new technologies and social networking tools for communication to selected target audiences” (Doerfert, 2011, p. 17). As today’s leaders, producers, and consumers demand more information, it becomes increasingly important that agricultural communicators find ways to address their growing needs for information and communicate with audiences in relevant and efficient ways. However, “the crisis communication research using social media is not well developed” (W.T. Coombs, personal communication, February 28, 2014). No models or theories focused on the process or strategy of using social media during a crisis, particularly those related to agriculture, exist as of yet. “The practice of crisis communications is ahead of research in terms of social media…There is a need to elaborate and build greater knowledge about crisis communications and new media with an emphasis on social media” (Coombs, 2008, pg. 1). By understanding how agricultural communicators are utilizing social media tools as part of their crisis communication efforts, we can help foster improved communication with target audiences in the event of future agriculturally-related crises. Additionally, gaining an understanding of the ways in which social media was being utilized during select crisis situations as well as the perceived effectiveness of its use can allow communicators handling future crises to address these situations more effectively and efficiently through social media outlets.

Three crises were chosen to be investigated in this study based on their use of social media surrounding crisis situations. The first crisis occurred in 2011 when a Listeria outbreak was discovered in cantaloupes originating from the Colorado-based farm. The cantaloupe farmers from across the state were forced to respond to nationwide media coverage and used their Facebook pages to disseminate information regarding their businesses and the outbreak to followers and the public. In addition, a public relations firm was hired by the farmers and the state of Colorado to help handle the situation. Based on crisis typologies from Coombs (2015), Ulmer, Sellnow, and Seeger (2007), and Seeger, Sellnow, and Ulmer (2003) this crisis is categorized as a traditional, unintentional, product crisis. The second crisis occurred in 2012 when a Texas-based agricultural museum experienced backlash after announcing its plans to add two mules, preserved by taxidermy, to their exhibit displaying 19th Century mechanized harvesting equipment. The museum received a lot of negative feedback from the public, and their Facebook page received an overwhelming amount of traffic and comments during the crisis to the point that the museum’s director was forced to shut the page down. According to Coombs (2015), Ulmer et al. (2007), and Seeger et al. (2003), this crisis is categorized as either an unintentional or intentional, social media, public perception crisis. The third crisis occurred in October 2013 when a severe winter blizzard hit South Dakota unexpectedly, following a period of overly warm temperatures, killing thousands of cattle in the region. Several social media outlets, including many blogs, were used to spread word nationwide about the devastating situation, particularly to those within the agricultural industry. According to Coombs (2015), Ulmer et al. (2007), and Seeger et al. (2003), this crisis is categorized as an unintentional, traditional, natural disaster. Each of these crises impacted the agricultural industry in different ways and social media played a major role in the communication surrounding each crisis.

**Purpose & Objectives**

To help agricultural communicators more effectively and efficiently address their target audiences during crisis situations, it is necessary to help them find ways to improve their crisis
communication efforts. This study sought to investigate social media use during select agriculturally-related crises as a means of understanding how social media played a role in the communication efforts of those involved with each crisis. The intended purpose of this research was to develop a model for using social media during a crisis situation aimed specifically for use by those in the agricultural industry. This model would be used as a means of aiding in the adoption, effectiveness, and efficiency of social media use in the agricultural industry. This study was guided by the following research objectives:

1. Describe the various ways in which agriculturalists and agricultural organizations used social media tools during crisis situations.
2. Examine the social media communication strategies that were used by agriculturalists and agricultural organizations during a crisis situation.
3. Examine the crisis communication plans that were used by agriculturalists and agricultural organizations.
4. Identify how agriculturalists and agricultural organizations perceived the effectiveness of their social media use during a crisis situation.
5. Describe the lessons learned by agriculturalists and agricultural organizations in regard to their social media communication during a crisis situation.

Methodology

A qualitative research design utilizing grounded theory methods was employed to investigate the research objectives of this study. Rather than beginning with a theoretical framework on which the research study is centered and supported, grounded theory begins with the data itself and develops theory that emerges from a particular context (Charmaz, 2006). Specifically, this study sought to develop a substantive grounded theory, which “relates to a specific phenomenon in the context of a clearly identified group of individuals” (Birk & Mills, 2011, p. 156), and is developed for an applicable or practical area and use (Glaser & Strauss, 1967).

Purposive and snowball sampling were used to select a total of six individuals, one to three individuals from each crisis, as participants for this study. This sample size was sufficient for a qualitative study of this nature, because in-depth information from a small number of people can be very valuable, especially if the cases are information-rich (Gall, Gall, & Borg, 2007; Erlandson, Harris, Skipper, & Allen, 1993). Also, having different perspectives on each crisis, which differed in magnitude and nature, helped the researchers establish a maximum variation sample, in which cases are selected to illustrate the broadest range of information possible (Lincoln & Guba, 1985).

One-on-one, semi-structured interviews were conducted with each participant selected for this study. A researcher-developed interview guide consisting of 17 open-ended questions was used to help focus and guide the interviews. Each interview was audio-recorded to aid in transcription and data analysis. Researchers also took field notes during each interview. Other data sources included documents and records supplied by the participants, related social media posts, and a researcher’s journal.

Interviews were transcribed verbatim, and data were analyzed using a constant comparative method of analysis with open, axial, and selective coding. Following an initial read through of all
interviews, data were analyzed using NVivo 10 software for Windows in which key concepts, phrases, or terms were organized into broad preliminary categories through open coding. From these initial codes, data were further organized into several axial codes. Interview transcripts were analyzed several times as the researchers continued to select additional information to include in the analysis. Preliminary codes and corresponding axial codes were then refined into a more cohesive coding system through several phases of comparing, combining and refining the codes until finally major themes were created. To assist in the formation of a model and theory, memoing, in which the researchers wrote down thoughts, feelings, insights, and ideas about the research project and the evolving theory, was used (Birks & Mills, 2011; Creswell, 2007). Memoing allows researchers to work through their ideas and provides a written record of analysis that helps the researcher construct the theory and understand the process at hand, while helping to avoid bias (Strauss & Corbin, 2008).

Trustworthiness and rigor were established through ensuring credibility, transferability, dependability, and confirmability. Researchers used triangulation of multiple sources of data, peer debriefing, and member checking as a means of establishing credibility in this study. Transferability was established through the use of a maximum variation sample and rich, thick descriptions of the data. Dependability was ensured through the use of an audit trail of all data collected, and confirmability was established through the use of a researcher’s journal in which researchers were reflexive and acknowledged how their experiences may have affected their view of the research.

Findings

Describe the various ways in which agriculturalists and agricultural organizations used social media tools during three specific crisis situations.

The social media tools utilized by each of the participants varied across a wide range of tools available (Table 1). All participants responded they used Facebook and Twitter in some capacity during their crisis communication efforts. The majority of participants also used some form of blog platform, with most of them utilizing blogs as the main social media outlet they utilized to discuss or share information regarding their crisis.

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<tr>
<th>Beth</th>
<th>Rick</th>
<th>Shane</th>
<th>Andrea</th>
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Note. Participants hosted their blogs on a variety of blogging platforms that were not identified in this study.
Participants reported using social media tools in a variety of different ways to communicate with stakeholders and the public during crisis situations. Some participants stated they used social media outlets as a means of monitoring news, information, and updates in the world, their industry, and specifically, surrounding the crisis situation they were facing. Maggie, a blogger and freelance writer from the western U.S., stated, “One of my main duties was to keep a pulse on what consumers were saying and so trying to put together blogs that could help producers explain to consumers.” Rick, a communications director and agricultural blogger from the northwestern U.S., added, “I’ve used my blog as one, a great way to share my experiences on a daily, day-to-day basis, but also use it as a resource for people who are looking for information who may be following me.”

Participants also commented on the types of responses they gave via social media. All of the participants stated they felt giving some type of initial response about the crisis via social media was important. Maggie stated, “Right away, it was just anything you heard you had to post it on Facebook and get the word out there.” Once an initial response was provided, participants stated they tried to find ways to share news, information, and updates with the public, whether that content was created by them or simply shared from other sources. Maggie stated, “It was just keeping the information in front of people.”

Examine the social media communication strategies that were used by agriculturalists and agricultural organizations during a crisis situation.

Most participants responded they had no specific social media strategy or policy they followed on a day-to-day basis, as well as no specific strategy or policy in mind when they responded via social media outlets to the crisis situation. Although no participants stated having a written strategy or policy they followed or used as a guideline, some suggested that they had strategies and policies in place for dealing with different aspects of social media use, but these were informal in nature. In regard to dealing with inappropriate or vulgar comments, Lori, an executive director of an agricultural museum in the southwestern U.S., said, “If they made threats or if they used any foul language, I did remove them. I blocked them.” Maggie agreed and added, “We don’t tolerate negative or personal attacks on our writers.”

Other participants mentioned that they had policies on how to handle responding to comments. On responding to negative comments, Rick stated: “A lot of the time that negativity is not worth responding to because you’re just fueling the fire and drawing attention to that negativity.” However, Maggie felt that responding to negative comments was necessary. She said, “Our main policy is don’t let those comments go unanswered…take a minute to further expand on your side of the story and bring it back to that main message you’re trying to get across.” Participants also discussed ways in which they tried to encourage dialogue with the public via social media. Rick stated: “Responding to positive comments is really good for fostering and building relationships. People want to follow and engage with you…if there’s potential for dialogue or conversations then I’ll kind of carry it along.”

In terms of strategy, some participants mentioned they tried to plan for certain day-to-day aspects of social media use when they could. Beth stated, “I have a plan for when things are going to release, I schedule posts, and do all that.” Rick added, “Our social media plan involves daily updates on our blog so that there are continual conversations.” Participants also mentioned
integrating all of their various social media outlets. Lori, for example, stated, “I had it released on Twitter and Facebook. I had it set where if it posted on one it posted on the other.”

*Examine the crisis communication plans used by agriculturalists and agricultural organizations.*

No participant mentioned that a formal, crisis communications plan had been used to help them more effectively communicate with stakeholders and the public surrounding the crisis. Although no formal crisis communication plan was utilized, participants’ responses indicate that some informal crisis communications strategies were implemented, and all agreed that a need for a crisis communication plan exists. Beth, a professional photographer and blogger from the western U.S., stated: “I think if there was something like that, I think that would be exceptionally helpful. I think that anything that can guide you is good.”

Participants also provided suggestions for what they felt should be included in a crisis communication plan including social media. Beth suggested that having a clear purpose for crisis communication was important. She said, “I think you have to have a clear grasp of what’s gone on and what your message is, because you might have someone who challenges you, so you’re going to need to be able to defend that position.” Similarly, participants mentioned having one clear message to convey to stakeholders and the public. Shane, a public relations and marketing professional from the western U.S., stated, “You need to have one message, one singular message that you want to communicate with talking points, all of that support for that message. And that’s gotta go out everywhere, including social media.”

Participants also responded that there was a need to establish a presence on social media well before a crisis situation develops. Maggie commented, “I guess the biggest thing of using social media to report the news is you’ve gotta have a presence.” Rick added, “I think blogging before the crisis happens, being involved in the conversations, and building those relationships before you need them and being proactive in that manner, it’s critically important.” Some participants also felt that having relevant, usable, and trustworthy information and resources on hand was important when handling communication surrounding a crisis and would allow them to share information more quickly and efficiently. Rick commented, “It would be really important to have your information resources, actual materials on hand and readily accessible.”

*Identify how agriculturalists and agricultural organizations perceived the effectiveness of their social media use during a crisis situation.*

A majority of the participants felt that social media played a major role in their communication efforts surrounding the crisis situations and agreed that social media was a positive contribution to their efforts. Shane stated, “When you’ve got a crisis situation like this, yeah, social media has a role.” A majority of participants responded that social media use was very effective in helping them communicate with stakeholders and the public surrounding the crisis situation they were undergoing. Andrea, a freelance journalist and photographer from the western U.S., stated: “I think they [social media sites] were the most effective means of communication used following the crisis.” Rick added, “It’s critically important in an age where news and information can go like a wildfire online…we see so many news stories broken on social media and covered on social media before the broadcast networks even get on the air.” Beth agreed that social media had an impact of the communication efforts surrounding the crisis she was involved in. She said,
“Oh, that [social media] was it! If there hadn’t been social media, there would still be plenty of people that had no idea what has gone on.”

Describe the lessons learned by agriculturalists and agricultural organizations in regard to their social media communication during a crisis situation.

Participants’ responses varied greatly on the lessons they learned from their experience handling crisis communications via social media. Andrea stated:

This is no longer a world where people assume that as a farmer or rancher that you do the right thing. This is a world where people question everything…You can no longer just clean up the physical results of a crisis in agriculture today. You have to also clean up the social results of a crisis.

Several participants agreed that people expect answers during a crisis situation. Andrea said, “If somebody has enough of a personal interest to contact you asking you a question…I think taking the time to respond to them…does a lot in these instances.” Participants also stated that asking for help or advice during a crisis was acceptable, and even encouraged, so that the best communication possible could be provided to stakeholders and the public. Maggie said, “Rely on those groups or networks that have a large outreach, and don’t feel like you have to recreate the wheel.”

Some participants also said they learned that truthful, accurate, and honest information was vital when communicating during a crisis and that transparency should be encouraged. Rick stated, “Transparency is the answer. The only way to address all the misinformation out there is with honesty and transparency.” Participants also learned that the public wanted true depictions of the crises and often responded better to raw, emotional, and truthful posts. Andrea stated, “I learned that what affected me the most and what I thought was those moments that I thought was the hardest or the bright spots that I shared were the most well-received by people.”

Finally, participants commented that they learned that people involved with the agricultural industry may not be the most willing to stand up and speak out on issues surrounding their livelihood. Rick stated, “We [the agricultural industry] haven’t been taking advantage of social media for communication, and a lot of people have been telling their versions of the stories of food production, agriculture, farming and ranching that are not always true.” Lori added, “I kind of feel like sometimes in agriculture we’re educated and we know what’s right and wrong, but we’re not the first ones to speak up.”

Participants also offered some advice to others in the agricultural industry in terms of using social media when handling a crisis situation. Andrea advised to always be prepared, and stated: “Specific to the agriculture industry, if you’re in it long enough, you’re going to go through something like this. And, we all know that.” Rick agreed and added, “Just be prepared to engage in conversation, be prepared to take the criticism that you’ll find out there, don’t look defensive, and be transparent.” He also commented that agricultural organizations should simply start somewhere in terms of social media. He said, “I think it’s important to recognize what you can do and can do well, and to take advantage of those and take it step-by-step as you try to get into social media and join in conversations.” Finally, Andrea said that agriculturalists should be
prepared to continue engaging in conversations pertaining to the crisis well after the crisis itself has ended. She stated, “You need to not just expect this to be something that is over when the initial crisis is over.”

Conclusions/Recommendations/Implications

Although no participants responded they used, or even had, a formal crisis communication plan, they recognized there was a need for them to have one. According to Sandman (1993), organizations that do not have a crisis communications plan often do nothing in response to a crisis, leaving them vulnerable to a multitude of possible consequences as a result of the situation. As with social media strategies, the literature on crisis communication largely encourages organizations to develop a crisis communication plan to aid in the effective handling of the crisis situation. Participants also suggested that a crisis communication plan should focus on establishing a presence on social media outlets prior to a crisis event. According to Veil et al. (2011), social media can be used for establishing, fostering, and maintaining customer relationships, and “technical advances are transforming how crisis management professionals and researchers view, interact with, and disseminate information to affected communities in a crisis situation” (p.1).

Most participants agreed their social media efforts were highly effective in helping disseminate crisis information and news and had a major impact on the communication they underwent during the crisis. Liu et al. (2012) stated that social media has become “a cultural phenomenon that has changed how all organizations manage crises online” (p. 354). Part of this success was attributed to the widespread popularity of social media outlets with the public. According to Austin et al.(2012) and a 2009 joint study conducted by George Washington University and Cision, a media tracking and measurement company, social media has the potential to have a direct or indirect impact on audiences during a crisis situation, especially as journalists increasingly turn to social media for news generation.

Social Media in Agricultural Crisis Communication Theory

From the findings and conclusions that emerged from this study, a substantive grounded theory was developed. The purpose of this theory was to help explain the use of social media in crisis communications so that more organizations can employ effective social media efforts during times of crisis. The model, depicted in Figure 1, divides crisis communication into three stages – pre-crisis, in-crisis, and post-crisis. Each stage of crisis communications requires some specific actions on behalf of the organization on social media.
Figure 1. Model of the Social Media in Agricultural Crisis Communication Theory.
In the pre-crisis stage, where organizations will spend the majority of their time and some will never leave, organizations should work to develop a crisis communication plan and should train employees and relevant participants on its use. During this time, organizations should also engage in actions on social media that will allow them to establish a presence, connect with stakeholders and the public, provide transparency and build relationships with key audiences, and gather relevant and related resources that can be referenced or shared. In the event that a crisis occurs, organizations would then move into the in-crisis stage. During this time, organizations would implement their crisis communication plan and put their training into action. During a crisis event, organizations should provide an immediate initial response on social media, respond to issues and comments surrounding the crisis, develop and provide a clear, unified message on behalf of the organization, and strive to provide accurate and personal accounts of the crisis situation. Once the crisis is resolved, organizations transition into the post-crisis stage, in which they work to revise and refine their crisis communication plan based on their evaluations of its use during the crisis. Organizations should also be prepared to continue participating in conversations about the crisis and its affects even though it has been resolved and should continue to strive to engage with stakeholders and the public to foster and maintain relationships. Finally, organizations will transition back to the pre-crisis stage and begin the process over again.

**Recommendations for Practice**

Based on the findings and conclusions drawn from this research, the researchers have several recommendations for both practice and future research. For practice, it is recommended that organizations implement social media tools as part of an organization’s overall communication efforts, as well as their crisis communication efforts. As much of the public is actively using social media to seek out, share, and comment on news and information, using these tools will allow organizations to be an active voice and source of information that stakeholders and the public can begin seeing as a trustworthy and reliable source of information and news. It is also recommended that organizations begin engaging audiences via social media as early as possible so that relationships can be established well before a crisis event occurs.

To help them better communicate with stakeholders and the public, it is recommended that organizations develop and implement social media strategies and policies, as well as a crisis communication plan. Having a unified social media strategy to be used throughout the organization can help ensure consistency in how social media communication is handled and will allow organizations to maintain frequent contact with social media audiences, focus on organizational goals and messages through social media posts, and maintain appropriate standards for handling comments and responses on their social media outlets. Similarly, a well-established crisis communication plan, including social media, would allow organizations to respond accordingly during a crisis event rather than hesitating to respond or not responding at all. Having a plan of action for how the organization will respond to a crisis event will allow them to make immediate contact with stakeholders and the public and will facilitate effective communication efforts throughout the crisis situation. It is also recommended that organizations undergo crisis communication training or provide such training for their employees. Many of the participants of this study indicated that they had little or no experience with crisis communication, so providing some form of training may help organizations be better equipped to handle crisis situations in the future.
Recommendations for Future Research
This study provided the groundwork for a variety of future research endeavors on social media’s use in crisis communications, particularly pertaining to agriculture. Many future studies could be conducted to continue this line of research, including expanding the scope of this study to include more agriculturally-related crises. Although there is not an abundant amount of agricultural crises that have occurred in the era of social media, there are others, particularly smaller regional crises, that could be investigated to bring new insights to this investigation. Additionally, the perspectives of the public and consumers on the social media efforts surrounding agricultural crises could be explored. Research into their thoughts, feelings, and perspectives on the communication efforts of the organizations via social media during the crisis situation could help us better understand the effectiveness and impact of the organization’s efforts. This may also provide valuable insight into why audiences sought out those communication channels during the crisis and how organizations can improve their efforts to better satisfy the public’s need for information during a crisis event.

Future research could also focus on in-depth analysis of the social media use surrounding specific agriculturally-related crises. An in-depth investigation of a specific crisis event and all of the communication surrounding it could provide a more detailed view of social media use and how the organization, stakeholders, and the public responded. Finally, future research should also focus on testing and further establishing the theory presented in this study. As evidenced by Coombs and others in the literature, theories take years to fully develop and establish. The theory presented in this research only provides the groundwork for the formation of theory and must be explored and tested further to truly establish its status as a theory. Further research should be conducted on expanding and exploring the elements of this phenomenon.

Implications
Through conducting this research, the researchers have realized the value that should be placed on social media tools as an aspect of crisis communications. Research has suggested that agriculturalists continue to expand upon their use of social media tools and is encouraging the use of social media in crisis communication (Allen, Abrams, Meyers, & Shultz, 2010; Baumgarten, 2012; Graybill-Leonard, Meyers, Doerfert, & Irlbeck, 2011; Meyers, Irlbeck, Graybill-Leonard, & Doerfert, 2011). Participants in this study also largely agreed that their use of social media greatly impacted the effectiveness of their communication efforts surrounding each crisis situation. As the popularity of social media continues to grow and more and more people turn to these sources for news and information, the researchers feel it is becoming increasingly important for those in the agricultural industry to implement social media in their communication efforts. Additionally, they must find ways to communicate even more effectively and efficiently as the communication needs of the public continue to change. As Currie (2009) stated, “The time is fast approaching when ‘social’ media will simply become ‘media’” (p. 14).

References


Fairgoers’ Attitudes Toward Youth Livestock Exhibits at the California State Fair

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Abstract

Developing public and policy maker understanding of agriculture and natural resources is a national research priority of the American Association of Agricultural Education. Due to cultural and geographic distancing from agriculture, consumers’ ability to obtain firsthand knowledge of agriculture may be limited to a handful of experiences including local, county, and state fairs. As such, agriculturalists’ opportunities to communicate with the public about production agriculture may be limited to these experiences. Youth livestock exhibitors fill a gap in the agricultural education system. While a body of research exists about agricultural literacy among youth and adult groups, few studies exist concerning the impact of youth livestock show exhibits upon fairgoers. This study employed a survey research method using semantic differential scales with a then-now approach. Fairgoers, who had been through the youth livestock exhibits at the California State Fair, were asked about their attitudes toward the exhibits. Findings led to the conclusion that viewing livestock exhibits and interacting with youth exhibitors results in fairgoers having more positive attitudes toward animal agriculture. Interaction between fairgoers and livestock exhibits should be encouraged and youth exhibitors should be prepared to view interactions with fairgoers as opportunities to educate people about agriculture.

Introduction

Agricultural fairs, or exhibitions, began as a means of trade for merchants from different countries (International Association of Fairs and Exhibitions, n.d.). Although it is not known for certain, according to the International Association of Fairs and Exhibitions, fairs existed as early as 500 BC (International Association of Fairs and Exhibitions, n.d.). The root meaning of the word fair is the Latin word feria, which suggests that in addition to trade, fairs served as a place of worship (International Association of Fairs and Exhibitions, n.d.). The partnership between fairs and churches was logical, considering worship as well as trade typically was concentrated in large cities. According to the International Association of Fairs and Exhibitions (n.d.), churches actually sponsored fairs during the early Christian era.

Efforts to preserve the educational components of fairs are being made to enhance fairgoers’ agricultural knowledge. Recently, fairs and shows have been used as a means to re-imagine British agriculture by improving consumers’ agricultural knowledge and perceptions (Holloway, 2004). “Shows are used to stage encounters and exchanges between farming and the non-farming public, which are increasingly rare in societies where many experience a distancing between themselves and the way their food is produced” (Holloway, 2004, p. 321). Holloway (2004) mentioned this shift might align fairs in the United Kingdom with those in North America. Being aware of how the presence of livestock at shows helps to impact the public, both breed
associations and youth exhibitors were asked to become directly involved in promoting agriculture at shows. Similar educational efforts are evident in North American shows.

Today, over 3,200 fairs are held each year in North America. They provide industrial exhibits, demonstrations and competitions aimed at the advancement of livestock, horticulture and agriculture with special emphasis placed on educational activities such as 4-H, FFA and similar youth development programs. (International Association of Fairs and Exhibitions, n.d., para. 12)

According to the Environmental Protection Agency (EPA) (2009), less than 1% of the population claims farming as their occupation and about 2% of the population lives on a farm. With this percentage dwindling, the majority of the population is becoming farther removed from production agriculture (EPA, 2009; Wachenheim & Rathge, 2002). As a result, “most Americans, whether young or old, have limited knowledge about agriculture and food production” (Frick, Machtmes, & Birkenholz, 1995, p. 44). Many would agree, however, that a basic understanding of agriculture and problems facing the industry would prove beneficial for both consumers and producers (Frick, Machtmes, Gardner, & Birkenholz, 1995). An increased understanding could lead to better management of food supplies and resources (Frick, Machtmes, & Birkenholz, 1995).

Consumers who are removed from agriculture can be influenced by experiences and interactions with agriculturalists, such as attending county and state fairs (Godfrey & Wood, 2003). Although studies have been conducted to describe agricultural knowledge and perceptions, little research has been conducted at fairs, which for some people is the only interaction they have with production agriculture. After all, perceptions of agriculture influence the agricultural industry via consumers’ buying and voting power (Wachenheim & Rathge, 2002).

Every year at the California State Fair, members of 4-H and FFA organizations enter exhibits to demonstrate competencies in their selected projects (California State Fair, n.d.). The fair, which runs for two weeks in July, is held in the State’s capitol city of Sacramento (California State Fair, n.d.). It first opened at its current location in 1968 and in 2011 had more than 521,000 attendees (California State Fair, n.d.). The fair features carnival rides and games, horse racing, a water park, exhibit buildings filled with vendors, and competitive livestock shows and exhibits.

During the fair, the public can watch 4-H and FFA members compete for championship honors both in and out of the show ring. Recognizing the need for the youth to understand that showing livestock serves as an opportunity to educate the public about these projects, the fair hosts an educational display competition (California State Fair, n.d.). These displays serve as outreach for the public to gain greater understanding about the youth and their efforts in addition to agriculture as a whole (California State Fair, n.d.). Additionally, youth are often available for conversations regarding their roles in the agricultural industry. This intrapersonal communication is a factor in the public opinion process (Hoffman, Glynn, Huge, Sietman, & Thomson, 2007). Finally, breed and specie organizations typically attend fairs to interact with the public, who may only experience agriculture through this lens (Holloway, 2004).

As people become farther removed from agriculture, their interaction with production agriculture decreases (Wachenheim & Rathge, 2000). Consequently, agricultural literacy is diminished and
perceptions of the industry are formed based on minimal hands-on experience with, and possible misrepresentations of, the industry (Turnbull, 2002).

Because a large portion of the population lives in urban and suburban areas, people’s ability to obtain firsthand knowledge of agriculture may be limited to annual local, county, or state fairs (Turnbull, 2002). As a result, agriculturalists’ opportunities to communicate with the public about agriculture may be limited to a handful of these experiences. A review of literature revealed little research exists that indicates what influence, if any, attending fairs has on fairgoers’ attitudes toward youth livestock fair exhibits.

**Theoretical Framework: Social Representation Theory**

Social representation theory is used to create understanding between expert and non-expert audiences through both discourse and imagery (Halfaree, 1993). This theory, developed primarily by Serge Moscovici, seeks to “outline how people understand, explain and articulate the complexity of stimuli and experiences emanating from the social and physical environment” (Halfaree, 1993, p. 29). A person’s perceptions and understanding of a concept are influenced by their predispositions and experiences with the subject (Moscovici, 2001). Moscovici (2001) noted the world, as people perceive it, is a result of responses to stimuli from the physical environment and the quasi-physical environments they live in.

One unique characteristic of social representation theory is how new information is processed and unfamiliar situations are integrated into concepts and ideas already understood by individuals (Buijs et al., 2012). Buijs et al. (2012) explained that anchoring allows new representations to be linked to concepts already understood. “Objectification allows an abstract thing to become concrete through projecting abstract constructs as concrete images, which then come to stand for the new phenomenon” (Buijs et al., 2012, p. 1170). Furthermore, Moscovici (2001) noted when we think about an unfamiliar concept, our images, learned habits, memories, and genetic predisposition all combine to make the concept as we imagine it. Social representations are linked to social groups and people who experience them; however, individuals interpret and internalize them differently based on discourse about the topic with experts and previous perceptions (Halfaree, 1993). Representations symbolize a specific means of communicating and understanding; they provide an idea for every image and from there, provide meaning, understanding, and significance to everyday life (Moscovici, 2001; Buijs et al., 2012).

Moscovici (2001) stated sometimes perceptions are misguided by “a pre-established fragmentation of reality, a classification of the people and things, which comprise it” (p. 19). Moscovici (2001) noted it is not uncommon that some previously assumed facts, basic to understanding and conduct, turn out to be misconceptions. Knowledge is gained by engaging in communication and imagery about the abstract and unfamiliar (Moscovici, 2001). Because the world we live in is social, Moscovici (2001) stated all information we receive is distorted to some degree.

Until recently, only a handful of agriculturally related studies used social representation theory as the framework (Buijs et al., 2012). However, studies have recently been published that “illustrate how the theory of social representations can be used to deepen our understanding of disputes
over land management and of how people conceptualize nature and natural resources” (Buijs et al., 2012, p. 1168). Halfacree (1993) suggested using this theory to develop a more encompassing definition and understanding of the rural. Halfacree (1993) agreed with Buijs et al. (2012) that social representations allow individuals to conceptualize new objects, events, and persons but also noted that understating the representations allows people to guide subsequent behaviors.

Researchers seem to agree the social property is deeply engrained in the theory (Buijs et al., 2012, Halfacree, 1995; Holloway 2004; Moscovici, 2001). “They [representations] are consensual means of making the unfamiliar, but this consensus is group specific. Only those who share a representation will use it the same way” (Halfacree, 1993, p. 30). Moreover, Halfacree (1993) stated social representations are inherently social due to the linkage to the communication process. Holloway (2004) also emphasized the communication process when he discussed this theory as the foundation of an effort to re-imagine British agriculture. He used the input from the chairs of several large agricultural societies, breed societies, and pedigreed breeders to determine what concepts should be focused on when engaging in social representations to educate the public at shows (Holloway, 2004). Holloway mentioned seeking to improve agricultural education and, in turn, agricultural perceptions might bring these shows in line with the North American model of agricultural shows.

Livestock and agricultural shows were targeted as points of convergence between farming and non-farming communities, which were said to be central to the effort of re-imaging agriculture and transferring agricultural knowledge (Holloway, 2004). Holloway (2004) stated, “shows are used to stage encounters and exchange between farming and the non-farming public, which are increasingly rare in societies where many experience a distancing between themselves and the way their food is produced” (p. 321). Focused on the opportunity to present a specific image of agriculture, breed associations, and livestock exhibitors were asked to help promote a positive image of agriculture (Holloway, 2004).

**Purpose/Objectives**

The purpose of this study was to determine if visiting livestock exhibits at a state fair impacts fairgoers’ attitudes toward livestock exhibits. The specific objectives guiding this study were:

1. Describe fairgoers at the California State Fair based upon age, sex, ethnicity, race, education, current residency, livestock ownership, 4-H and/or FFA experience, occupation, if they had family members who lived on a farm, and time spent viewing the exhibits.
2. Identify the fairgoers’ attitudes about livestock fair exhibits at a state fair before viewing the livestock exhibits.
3. Identify the fairgoers’ attitudes about livestock fair exhibits at a state fair after viewing the livestock exhibits.
4. Determine if visiting the livestock exhibits impacted fairgoers’ attitudes about livestock fair exhibits.
Methods/Procedures

The population for this study consisted of adult fairgoers who attended the California State Fair on July 14, 2012. During this time, a convenience sample of the population, composed of people near the livestock exhibits, was identified to participate in the study. Sponsorship funds were available to support a sample of 400 people. One individual did not wish to take the participation incentive, which allowed an additional person to take the questionnaire. This process resulted in a sample size of 401 subjects. Of these, 395 responses were deemed usable. This population is only representative of people who attended the fair and were near the livestock exhibits during the specified times. Due to this sampling method, conclusions of this study cannot be generalized to everyone who attended the California State Fair.

This study was intended to describe fairgoers’ attitudes before and after viewing the livestock exhibits and whether visiting the exhibits impacted their opinions of youth livestock exhibits at the California State Fair. The instrument was administered after fairgoers visited the livestock animal exhibits, which required participants to retrospectively assess their initial opinion of the livestock exhibits. This then-now approach is an accepted procedure for collecting attitudinal data (Townsend & Wilton, 2003).

The questionnaire consisted of 11 questions to gather data about participants’ age, sex, race, ethnicity, education, 4-H and FFA experience, and residency. These questions were developed based on questions included in the U.S. Census (2010) and modified questions from Frick, Machtmes, and Birkenholz’s (1995) study of agricultural literacy. Fairgoers also were asked how long they spent in the exhibits, and why they attended the fair.

The instrument included two tables of semantic differential scales (Osgood, Suci & Tannenbaum, 1965) to assess attitudes of fairgoers before and after viewing exhibits. A semantic differential is composed of dichotomous terms separated by a seven-point scale (Osgood et al., 1965). Osgood et al. (1965) designed the semantic differential to objectively measure three attitudinal factors: evaluative, potency and activity. The stem question for the semantic differentials on this instrument was: “Youth Livestock Exhibits at the California State Fair are.”

The instrument was reviewed for content and face validity by a panel of five experts from the College of Agricultural Sciences and Natural Resources at Oklahoma State University as well as individuals involved in livestock shows and youth competitions from California and Oklahoma. The panel provided feedback and suggestions on both the content and format of the questionnaire. The experts suggested modifications for the format of tables and the wording of some demographic questions.

A pilot study was conducted at a county fair located in the same geographic area as the California State Fair. Thirty people participated in the pilot. Feedback from participants indicated some ambiguity existed regarding some of the selected word pairs. As a result of this finding and further discussion about the purpose of the study, we determined to focus only on assessing the evaluative attitude factor. According to Isaac and Michael (1982), word pair selection should be based on relevance and appropriateness to the topic. Consequently, new word pairs were selected from a list by Osgood et al. (1965). A Cronbach’s alpha reliability analysis was conducted on the items resulting in a .85 for the then table and .83 for the now table.
Data collection for this research was conducted on one day at California State Fair. One of the researchers and 15 trained volunteers identified subjects and administered the questionnaire. To qualify as a subject in the study, a participant had to be at least 18 years of age, could not know anyone exhibiting livestock, and had to have visited the livestock exhibition barn that day. During the entire data collection period, breeding swine and breeding sheep shows were taking place in the livestock exhibit barn. Fairgoers had the opportunity to view those shows from bleachers surrounding the show rings and walk through other areas of the facility. Announcers for each show often provided industry facts and described activities taking place in the show ring to further enhance the educational aspect of the show. Subjects who completed the instrument were provided $5 cash as an incentive for participating in the study.

Data analysis for the first objective consisted of descriptive statistics including frequencies and appropriate measures of central tendency. Means were calculated for constructs associated with the semantic differentials. A paired samples t test was used to determine if the change in participant perceptions was significant. The confidence level for this study was set at $\alpha = .05$, a priori.

**Findings**

**Findings Related to Objective 1: Description of the Subjects**

Participants in this study were asked to respond to items indicating their age, sex, ethnicity, race, education, current residency status, livestock ownership, 4-H experience, FFA experience, if they have relatives who live on a farm, and if they have worked in agriculture. They also were asked how much time they spent in the livestock exhibits while at the fair.

Of the 395 respondents, 377 provided their age. The youngest participants were 18 years old and the oldest was 80 years old. Nearly 39% ($n = 146$) were between 18 and 35 years old. Nearly 55% ($n = 206$) were between 36 and 55, while almost 19% ($n = 71$) were more than 55 years old. More than half (58.2%, $n = 219$) of the respondents were female. Of the 373 participants who provided their ethnicity, 13.1% ($n = 46$) identified themselves as Hispanic and 86.9% ($n = 324$) identified themselves as non-Hispanic. Of the respondents who provide their race ($n = 376$), 77.9% ($n = 293$) identified themselves as white, 1.6% ($n = 6$) identified themselves as African American, 4.8% ($n = 18$) indicated they were Asian, 1.3% ($n = 5$) identified themselves as American Indians or Alaska Native, 1.9% ($n = 7$) identified themselves as some other race, and 12.5% ($n = 47$) identified themselves as being two or more races. No respondents identified themselves as Native Hawaiian or other Pacific Islander. The questionnaire revealed that for 18.2% ($n = 72$) of respondents, high school was the highest level of education achieved. More than one-third (35.4%, $n = 140$) had completed some college, 29.9% ($n = 118$) had obtained a bachelor’s degree, and 16.5% ($n = 65$) had a graduate degree.

Of the respondents ($n = 391$), 3.6% ($n = 14$) said they lived on a farm, 12.9% ($n = 51$) indicated they lived in a rural area, 60.8% ($n = 240$) identified their residence as suburban, and 21.8% ($n = 86$) indicated they were urban residents. Respondents were asked if they had ever owned livestock. Just more than one-third, 35.2% ($n = 135$), had owned livestock and 64.8% ($n = 249$) indicated they had not owned livestock. Of the 389 respondents, 14.9% ($n = 58$) had participated in 4-H and 85.1% ($n = 331$) had not participated in 4-H. Of the 58 who participated in 4-H, 38 responded with the number of years they participated. The responses ranged from 1 to 12 years,
with 63.2% (n = 24) of respondents indicating they participated for five or fewer years. Of the 387 respondents, 7.1% (n = 28) indicated they participated in FFA and 90.9% (n = 359) indicated they had not participated in FFA. Of the 28 who participated in FFA, 16 responded with the number of years they participated. The responses ranged from 1 to 6 years, and 43.9% (n = 7) responded they participated for three or fewer years. Of the 395 respondents, 42.5% (n = 168) of respondents indicated they had a relative who lived on a farm, and 57.5% (n = 227) said they did not have a relative who lived on a farm. Of the 392 respondents, 5.1% (n = 20) indicted they worked in agriculture, and 94.9% (n = 372) said they did not work in agriculture.

Participants were asked to estimate how long they spent in the livestock exhibits. Of the 380 respondents, 9.7% (n = 37) spent 10 minutes or less, 33.2% (n = 12) spent 11-20 minutes, 29.7% (n = 113) indicated they spent 21-30 minutes, 5.5% (n = 21) spent 31-40 minutes, 10.8% (n = 41) spent between 41-50 minutes, 9.2% (n = 35) spent 51-60 minutes, and 1.8% (n = 7) indicated they spent more than 60 minutes in the exhibits.

Findings Related to Objective 2: Attitudes About Youth Livestock Exhibits Before Visiting Livestock Exhibits
The second objective was designed to describe participants’ evaluative attitude about youth livestock exhibits prior to visiting the youth livestock exhibits at the California State Fair. Ten of the 12 dichotomous pairs had a mode of 7, the most positive response possible. Slightly more than 50% (f = 198) of the respondents marked 7 for the work pair Negative/Positive. More than 40% of the respondents marked 7 for five pairs and more than 30% of the respondents marked 7 for four other pairs. The only two pairs that did not have a mode of 7 were Ugly/Beautiful and Dirty/Clean, each of which had a mode of 4, correlating with a neutral or undecided response. These data are displayed in Table 1.

Findings Related to Objective 3: Attitudes About Youth Livestock Exhibits After Visiting Livestock Exhibits
The third objective was designed to describe participants’ evaluative attitude about youth livestock exhibits after visiting the youth livestock exhibits at the California State Fair. Eleven of the 12 dichotomous pairs had a mode of 7, the most positive response possible. More than 50% of the respondents marked 7 for 8 of the 12 pairs. The pair with the highest modal response was Unsuccessful/Successful with 58.4% (f = 230) marking 7. More than 40% of the respondents marked 7 for two pairs and more than 30% of the respondents marked 7 for one other pair. The only pair that did not have a mode of 7 was Dishonest/Honest, which had a mode of 6.

Findings Related to Objective 4: Difference Between Fairgoers’ Attitude Before and After Viewing Livestock Exhibits
A paired-samples t test was conducted to detect differences in subjects’ attitude after viewing the livestock exhibits. Responses for the 12 word pairs were summed to calculate a mean score for the evaluative attitude scales collected before visiting the livestock exhibits. The same calculation was done for the evaluative attitude scales collected after visiting the livestock exhibits. The mean for attitude before viewing the livestock exhibits was 67.35 with a standard deviation of 12.36. The mean for attitude after viewing livestock exhibits was 73.04 with a standard deviation of 10.30 (see Table 3). A paired-samples t test was used to evaluate change in attitudes before and after viewing the exhibits. The difference was statistically significant at the specified .05 level, t(375) = -13.20, p <.001. To determine the practical significance, a Cohen’s d
effect size was calculated. This statistic demonstrates the practical significance the exhibits had on participants’ attitudes. To determine the effect size, the mean difference was divided by the pooled standard deviation (Thalheimer & Cook, 2002). To establish this value, the mean for attitude before viewing exhibits was subtracted from the mean for attitude after viewing exhibits and divided by the pooled standard deviation, \(73.04 - 67.35 / 11.33 = 0.5\). According to Cohen (1992), 0.5 represents a medium effect size.

**Conclusions and Discussion**

**Conclusions, Recommendations, and Implications Related to Objective 1**

The typical respondent to this study is a middle-aged, suburbanite female with at least some higher education. She has never owned livestock or been involved in 4-H or FFA, and has not worked in agriculture. She viewed the livestock exhibits briefly.

The general demographic makeup of participants with regard to sex, age, race, and ethnicity is fairly consistent with the 2010 census information for California (U.S. Census Bureau, 2010). However, the proportion of Hispanic participants is much lower, at 13% when compared to the general California population, which is more than 37% (U.S. Census Bureau, 2010). The low percentage of Hispanic respondents is a curiosity. This occurrence could be due to the fact that the questionnaire was available in English only, thus inhibiting Hispanics from participating in the study. If the study is replicated, the questionnaire should be translated into Spanish to facilitate Spanish speakers’/readers’ participation in the study.

A report from the California Postsecondary Education Commission (2007), stated that just more than 60% of Californians ages 25 to 64, have had some post-secondary education. A higher proportion of the participants in this study (80%) indicated they had completed some college or other higher education. Interestingly, five percent of the participants in this study indicated they are employed in agriculture, which is more than the national average of one percent (EPA, n.d.). This difference might be explained by the fact people employed in agriculture might be more likely to view livestock exhibits.
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*Note. Modal responses are boldfaced.*
Table 2
Semantic Differential Scales Associated with Attitude After to Viewing Livestock Exhibits

<table>
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<th>Negative Item</th>
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<th>4</th>
<th>5</th>
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<th>Positive Item</th>
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<tr>
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<tr>
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<tr>
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<td>0.0</td>
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<td>3.3</td>
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<td>5.3</td>
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<tr>
<td>Ugly</td>
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<tr>
<td>Sad</td>
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<td>41</td>
<td>10.5</td>
<td>57</td>
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</tbody>
</table>

*Note.* Modal responses are boldface
Results can only be generalized to the 395 participants. Due to the limited time frame during which questionnaires were distributed, this study should be repeated during the other times of the day to determine if participant demographics and responses change based on the time of day. We recommend the study be replicated at county and local fairs in different areas across the state and nation.

**Conclusions, Recommendations, and Implications Related to Objective 2**

Overall, respondents’ attitudes about youth livestock exhibits prior to viewing the exhibits are positive. This conclusion may be a result of their previous experiences with or knowledge of agriculture, or even previous experience with the exhibits at the state fair.

**Conclusions, Recommendations, and Implications Related to Objective 3**

Respondents’ attitudes toward youth livestock exhibits remain positive after viewing the exhibits. Additionally, after viewing the exhibits the positivity of attitudes for all pairs improved, including beautiful/ugly and clean/dirty. Therefore, we conclude that viewing livestock exhibits contributes to more positive attitudes about livestock exhibits. The improvement in attitude is supported by Holloway’s (2004) concept of using social representation theory to improve agricultural perceptions.

Duncan and Broyles (2006) stated people more accurately perceive a concept after experiencing it, which supports the improved positivity of perceptions after viewing the exhibits. This improvement demonstrates to agricultural communicators, fair administrators, youth organization leaders, and fair exhibitors that livestock shows make positive contributions to the industry (Diem & Rothenburger, 2001).

**Conclusions, Recommendations, and Implications Related to Objective 4**

The change between evaluative attitude regarding livestock exhibits held by fairgoers before and after viewing such exhibits is statistically significant and has a medium effect size. Therefore, the youth livestock exhibits influences fairgoers’ attitudes toward youth livestock exhibits in a positive way. The most noticeable changes are in opinions of the cleanliness and beauty of the exhibits. Attitudes changed in a positive manner, indicating respondents clarified previous ambiguity they had regarding the exhibits (Holloway, 2004).

Given the medium effect size, it is concluded that although an impact is made, exhibits can be more impactful. To make this impact, club leaders for 4-H and FFA advisors should increase efforts to provide educational exhibits for fairs and ensure youth are available to engage in conversations with fairgoers. Admittedly, a great deal of financial resources and time go into constructing educational displays (Diem & Rothenburger, 2001); however, as demonstrated by this study, doing so does have a payoff in improving perceptions. It may even validate the need

<table>
<thead>
<tr>
<th>Data Set</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
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<td>12.36</td>
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<td>___</td>
</tr>
<tr>
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</tbody>
</table>

$df = 374; \alpha = 0.05$
for fundraising efforts by agricultural organizations and companies to ensure displays can be improved to increase literacy and awareness of youth projects.

This study supported a British movement to improve perceptions and knowledge of agriculture by increasing communication, interaction, and imagery between farming and non-farming publics (Holloway, 2004). Holloway (2004) stated times of convergence between experts and non-experts, such as fairs, can improve consumer perceptions and increase their knowledge and understanding of agriculture. The intrapersonal communication and imagery provided by the exhibits and exhibitors impacted participants’ attitudes (Holloway, 2004; Moscovici, 2001). Therefore, youth organizations such as 4-H and FFA should continue to ensure exhibits are both educational and aesthetically pleasing. As the study indicated, cleanliness and beauty were the two areas with the least positive attitudes.

Holloway (2004) suggested that in addition to exhibitors, organizations should also become engaged in interacting with fairgoers to further enhance the educational experience at fairs. The same could be said for North American organizations such as the Western Fairs Association and specie organizations. Participation on behalf of these groups might fill an additional educational gap when exhibitors are showing and have less time to interact with fairgoers, as was the case during this study.

Even though few previous studies regarding attitudes at fairs have been conducted, the findings agreed with studies of agricultural perceptions, which stated that participant’s perceived agriculture positively (Tolman, 2009; Wachenheim & Rathge, 2002). Although attitudes initially were positive, interaction with agriculturalists improved these; thereby, changing attitudes as Wachenheim and Rathge (2002) indicated was possible.

The social representation theory also states the image of the industry that is presented is the one people will see and perceive (Moscovici, 2001; Holloway, 2004). It is not unreasonable, therefore, to postulate that fairgoers will extend these positive perceptions of youth livestock exhibits to agriculture as a whole. The results of this study could validate the implementation of a similar re-imaging of American agriculture via annual local, county, and state fairs as a means to improve attitudes about agriculture (Holloway, 2004).

While this study demonstrates the benefit of youth livestock exhibits for improving perceptions, it only described if a change occurred and if it was significant. A qualitative study should be conducted to glean a deeper understanding of how participants’ attitudes are formed and altered. Determining what aspects most significantly impact fairgoers’ opinions can lead to improved communications strategies by exhibitors. Furthermore, one final area where this study was limited was the reliance on participants’ retrospective assessment of the exhibits. Therefore, a true pretest/posttest version of the study should be conducted to determine if the results differ.

Using this understanding of attitudes, agriculturalists can create communication strategies to positively influence consumers’ attitudes and understanding of agriculture (Goodwin, Chiarelli, & Irani, 2011). Furthermore, youth organization leaders need to work to ensure their groups are positive liaisons for agriculture by communicating with consumers and having clean and informative displays (Diem & Rothenburger, 2001).
References


Northwestern Agricultural Education State Staff Members’ Views on Community-
Secondary Agricultural Education Program Partnerships

Douglas T. Masser, University of Idaho
Jeremy M. Falk, University of Idaho
Kattlyn J. Wolf, University of Idaho

Abstract

Partnerships have become a major vehicle for preparing students with 21st century skills in Career Technical Education (CTE). These partnerships add relevance and rigor to all CTE classrooms, including agricultural education. Despite the importance of partnerships, not all programs are capitalizing on the benefits collaboration can offer, prompting a need for in-depth research on the current views of agricultural education professionals regarding community partnerships. The purpose of the study was to describe the views of agriculture education state staff members in the Northwestern United States on community-agricultural education program partnerships. Semistructured interviews were used to gather data for the case study. Based on the views of agricultural education state staff, four themes emerged: stakeholder-agricultural education program partnership is essential; partnership is a two-way street; partnership is locally focused; and barriers prevent collaboration. Further research is needed to explain community support from the perspective of the agriculture teachers and the community stakeholders involved. Only then will the discipline understand the mechanics behind community stakeholder-agricultural education program partnerships.

Introduction

The focal point of the United States’ modern education system is for every student to graduate from high school and receive some form of post-secondary education (Duncan, 2013). As a result of this educational focus, our current education system must provide students with a unique blend of technical and employment skills. Arne Duncan, the United States Secretary of Education, addressed Career Technical Education (CTE) teachers from across the nation at the national meeting of the Association for Career and Technical Education. Duncan (2013) stressed that, “high-quality career and technical education is absolutely critical to meeting that challenge.” To address the issue of unemployment and a continued skills gap that exists in society however, “high schools, community colleges, employers, business leaders, parents and students themselves must all work together to strengthen this pipeline of the middle class” (Duncan, 2013).

In response to the nation’s desire to prepare students with technical and employment skills, the future vision for CTE reflects the challenges and opportunities that preparing students with 21st century skills can offer. A common theme that threads both Duncan’s (2013) comments and the vision for CTE is partnership. A CTE program that accurately reflects the end goal of the United States education system, “actively partners with employers to design and provide high-quality, dynamic programs” (Cotner & Folkers, 2012, p. 5). In agricultural education, “well-organized and conducted agricultural education programs are community oriented. Instruction takes place in the community as well as in the school” (Newcomb, McCracken, Warmbrod, & Whittington, 2004, p. 13).
According to Albrecht and Hinckley (2012), “perhaps if the importance and power of partnerships were better understood and more effectively utilized, Career Technical Education (CTE) – indeed, all of education, – would be producing better results” (Albrecht & Hinckley, 2012, p. 123). To better understand the partnerships that exist, Dryfoos (1998) and Epstein (1995) recommend that case studies be conducted to describe partnerships in a specific context. In-depth analysis and dissemination of effective partnerships can then be held up as a model in agricultural education, providing a support framework to be implemented by other programs in the region.

Adding to the literature base on building effective partnerships with agricultural education also addresses “Priority 5: Efficient and Effective Agricultural Education Programs” of the American Association for Agricultural Education National Research Agenda for 2011-2015 (Doerfert, 2011). The data from the study has the potential to positively impact agriculture teachers as they build a network of support needed to effectively run a modern agricultural education program.

**Research Question**

The purpose of this qualitative case study was to describe the views held by agricultural education state staff members in the Northwestern United States (Washington, Oregon, Idaho, Utah, Montana, Nevada, and Wyoming) on community-agricultural education program partnerships. Specifically, the research study aimed to answer the following research question: How do agricultural education state staff members in the Northwestern United States view community-agricultural education partnerships?

**Review of Literature**

Stakeholder involvement in public education provides many benefits to the overall school and student. According to Epstein (1995), “with frequent interactions between schools, families, and communities, more students are more likely to receive common messages from various people about the importance of school, of working hard, of thinking creatively, of helping one another, and of staying in school” (p. 702). Specifically, stakeholders can improve the school climate, school deterioration, risky communities, fragmented service systems that affect schools, and help teachers with their work (Dryfoos, 1998; Epstein, 1995; Epstein et al., 2009; Sanders, 2001).

In CTE, partnerships provide support to teaching and learning that takes place in the classrooms (Albrecht & Hinckley, 2012; Pawlowski & Meeder, 2012). By including stakeholders in the classroom, the program can be connected to the community and secure both financial and technical support from the community members (Palowski & Meeder, 2012, p. 6). It is because of the experts that partner with CTE that these programs can offer cutting edge skill development and internship opportunities (Albrecht and Hinckley, 2012).

Partnership between community stakeholders and the education system can be diverse in the type and kind of partnerships that are fostered (Sanders, 2001; Sanders, 2003). There is no one-size-fits-all approach to partnership so each program should look locally to meet the unique needs of the community (Decker & Decker, 2003, p. 69). Among local stakeholders, business and industry partners are the most common members of educational partnerships. Other stakeholder
groups include universities, volunteer organizations, community individuals, advisory committees, and parent groups (Decker & Decker, 2003; Sanders 2001; Sanders, 2003).

In agricultural education, there are certain stakeholder groups that often play a vital role in programs across the nation. “Everyone who is affected by the agriculture program plan should participate either directly or indirectly in its preparation. Agriculture teachers should not attempt to plan the agriculture program by themselves” (Phipps, Osborne, Dyer, & Ball, 2008, p. 95). These local groups most commonly include business and industry groups, advisory councils, FFA Alumni, or parent support groups (Phipps et al., 2008).

Dormody, Seevers, and Clason (1996) found in their study of a random sample of United States agriculture teachers that agriculture teachers had positive attitudes toward advisory councils, FFA Alumni groups, and Young Farmer groups. Tillinghast, Ramsey, and Terry (2013) investigated the perceptions of volunteer support of a sample group of 41 agriculture teachers from Oklahoma. According to Tillinghast et al. (2013), the school-based agricultural education teachers who participated in this study value the contributions that volunteers provide the program. The teachers believed that, with proper training, volunteers could ease their stress and workload.

While agriculture teachers see the need for community support, needs-assessment studies suggest a gap remains between research and practice. Stair, Warner, and Moore (2012) found that preservice and new teachers are somewhat concerned about developing community support, organizing an advisory committee, and recruiting and retaining alumni members. Other researchers in agricultural education found similar results in states across the nation for both new and veteran teachers (Joerger, 2002; Layfield & Dobbins, 2002; Myers, Dyer, & Washburn, 2005; Sorensen, Tarpley, & Warnick, 2010). While teachers feel community aspects are vital to the classroom, they do not feel efficacious in establishing and perpetuating community-agriculture program partnerships.

Previous literature also exists on the barriers preventing effective partnerships. Teachers often do not want the public watching over what is done in the classroom in fear of being scrutinized over their decisions (Sanders, 2001). Governance, communication, power/control issues, facilities, transportation, and funding were all additional barriers that hindered community collaborations. (Decker & Decker, 2003; Dryfoos, 1998).

Methods

A case study research design was used to describe the views of agricultural education state staff members in the Northwestern United States. According to Merriam (2009), “a case study is an in-depth description and analysis of a bounded system” (p. 40). To ensure that the methods were appropriate for the agricultural education discipline, Dooley’s (2007) recommendations on how to frame agricultural education research through a qualitative lens were also considered.

According to Yin (2008), case studies are best used to describe “why” and “how” qualitative projects. The focus of this research study was to identify how agricultural education state directors in the Northwestern United States view community-agricultural education partnerships, making the case study approach suitable for addressing the research question. Another defining
characteristic of case study research is the presence of a defined, bounded system, or a specific phenomenon that can be “fenced in” by the researcher as the primary focus (Merriam, 2009, p. 40). Since the study focused exclusively on the seven states in the Northwestern United States, there were only seven possible participants to include in the study.

**Researcher Subjectivity**

Because the researcher is the primary instrument in qualitative research, the researcher’s views and experiences affected all processes of the research study. As Saldana (2013) stated, the researcher’s “level of personal involvement as a participant observer – as a peripheral, active, or complete member during fieldwork – filters how you perceive, document, and thus code your data” (p. 7). It is important that all readers also consider their own preexisting knowledge as well as the perspectives of the researcher.

The researcher was raised with strong agricultural ties and was an active member in the agricultural education program. The background in agriculture led the researcher to pursue a degree and certification in agricultural education. Prior to teaching, however, the researcher chose to pursue a master’s degree in agricultural education. At the time of the study, the researcher was a graduate student, pursuing a Master’s of Agricultural Education, with plans to teach secondary agricultural education. It should be emphasized that the researcher had limited teaching experience in the formal high school classroom. The researcher did complete a 16-week student teaching experience as part of the undergraduate degree program but that was the extent of the researcher’s teaching experience. It is through this lens that the researcher conducted the study.

**Participants**

The focus of the study was on community support for agricultural education, specifically in the Northwestern United States. Agriculture programs vary greatly from region to region, making the process of informing relevant professional development and consumable research for a region’s teachers a challenge. For this reason, only the states that bordered the research institution were included in the study. The seven states represented were Washington, Oregon, Idaho, Utah, Nevada, Wyoming, and Montana. From each state, the primary agricultural education state staff member was selected to participate in the study.

A unique aspect of case studies is that the context of the bounded system is the center of the investigation (Baxter & Jack, 2008; Merriam, 2009). “With its own unique history, the case is a complex entity operating within a number of contexts – physical, economic, ethical, aesthetic, and so on” (Denzin & Lincoln, 2000, p. 440). The researcher began each interview by allowing the participants to describe how they became involved in agricultural education and how they progressed into their current position as an agricultural education state staff member.

All seven participants had strong ties to agriculture and agricultural education. Many participants were raised on farms or ranches in the western region of the United States. Regardless of their personal ties to agriculture, all of the participants shared a common interest and involvement in secondary agricultural education.

All seven participants had formal teaching experience in agricultural education. The participants taught anywhere from three to 30 years, all in states located in the Northwestern and
Southwestern United States. During the interviews, the participants would often view each question through their agriculture teacher lens and their state staff position, providing complete answers that encompassed their views on community support for agricultural education programs. The roles of each individual included close contact with all the agriculture programs and teachers in the state through curriculum review, funding approval, and FFA activities.

**Data Collection**
The researcher chose to use semistructured interviews to access the views of agricultural education state staff members. As opposed to structured interviewing, semistructured interviews provided the researcher with the flexibility to include a mix of formal and probing questions into the interview. “This format allows the researcher to respond to the situation at hand, to the emerging worldview of the respondent, and to the new ideas on the topic” (Merriam, 2009, p. 90).

The interview protocols outlined by Creswell (2008) and Merriam (2009) guided the data collection process. Upon receiving exemption status from the University of Idaho Institutional Review Board (IRB), the seven participants were first identified and contacted by the researcher by phone. During the phone call, the researcher explained the study and encouraged participation. All seven state staff members agreed to participate.

After a verbal commitment, the participants received an email thanking them for volunteering. The participants each signed the consent form that was attached to the initial email and sent it back to the researcher with his/her preferred interview time. Due to the extreme geographic distances that existed between states, phone interviews were conducted. According to Seidman (2013), phone interviews can provide a viable alternative to face-to-face interviews if the researcher is thoughtful about the process.

The researcher made it a priority to establish a close relationship with each participant to help overcome the barriers associated with phone interviews. The researcher made initial contact via phone to recruit the participants for the study. The researcher also established face-to-face contact with four of the participants at the National FFA Convention held a week prior to the interviews. The face-to-face introductions helped to create a closer relationship that opened the lines of communications between the individuals.

Phone interviews were conducted in the four weeks following the initial contact by phone. Each interview followed the same set of pre-established interview questions. The researcher, however, added probing and additional questions to encourage participants to elaborate on specific ideas and examples (Creswell, 2008; Merriam, 2009; Seidman, 2013). The researcher recorded each 45-60 minute interview for later transcription.

**Analysis**
The researcher transcribed each of the seven interviews verbatim for further analysis. Through this process, the researcher not only produced a verbatim script of the interview, but also became familiar with the content of each interview. Each interview was then reviewed a final time to ensure that the transcripts accurately captured the interviews.
Initial coding was first used to break the transcripts down into discrete parts (Saldana, 2013). The researcher reviewed the transcripts and noted possible categories in the margins to allow for further reflection to occur on the meanings of these categories. Keywords and phrases were also highlighted throughout the transcript for later analysis. Saldana (2013) suggested that small-scale studies use this hard-copy method to help provide more control and ownership over the work (p. 26). Pattern coding was then used to develop more specific categories, which were used to develop the final themes of the study (Saldana, 2013). To protect the participants, the data was only analyzed and report as a case, not individual participants.

**Issues of Trustworthiness**

The researcher took measures in the study to establish credibility, dependability, confirmability, and transferability (Bloomberg & Volpe, 2012; Denzin & Lincoln, 2000; Dooley, 2007). To establish creditability, the researcher clarified the biases that may affect the data analysis. Also, member checks were used. The researcher emailed each transcript back to the participant to verify the accuracy of the manuscript (Bloomberg & Volpe, 2012).

To establish both dependability and confirmability, the researcher worked with two agricultural education faculty members. Both the researcher and faculty members coded all seven interviews to establish inter-rater reliability and ensure triangulation of the data (Bloomberg & Volpe, 2012). Verbatim transcripts also allow the researcher to trace the data to the source. To establish transferability, the researcher attempted to add richness for the readers of the study by including quotes and personal examples provided by the participants. While the intent was not to generalize to other cases, the researcher did add detail to allow the reader to share in the experiences discovered during the study (Bloomberg & Volpe, 2012; Dooley, 2007).

**Limitations**

One limitation of the study was that telephone interviews were conducted to gather the views of the participants. Although telephone interviews were necessary due to the geographic distances, Creswell (2008) stated, “one drawback of this kind of interviewing is that the researcher does not have direct contact with the participant. This causes limited communication that may affect the researcher’s ability to understand the interviewee’s perceptions of the phenomenon” (p. 227).

**Results**

Four primary themes emerged that encompassed the views of agricultural education state staff members in the Northwestern United States concerning community partnerships. The first theme was stakeholder-agricultural education program partnership is essential to all agricultural education programs in the Northwestern United States. The second primary theme was partnership is a two-way street. The third theme identified in the study was partnership is locally focused. The fourth and final theme was barriers exist, preventing collaboration. Within the final theme of barriers, two subthemes emerged. The first of which was the personality of the agricultural education teacher and the second was external factors prohibiting collaboration.

**Theme 1: Stakeholder-Agricultural Education Program Partnership is Essential**

The seven participants in the study had extensive experiences in agricultural education at all levels: student, teacher, and state staff. As each participant shared his/her views of agricultural education, there was a common thread that laced all thoughts together: stakeholder-agricultural
education program partnerships are vital. As thoughts about community partnerships were shared, one participant stated,

I think they are imperative! They are imperative to make sure that we are staying on the cutting edge for what we are offering, keeping that industry tie for our students so that we are creating the best opportunities for students, which is really beneficial for everybody.

As each drew on his/her experiences, there was resounding support for the essentialness of community partnerships. Adjectives like “vital”, “imperative”, and “essential” arose as descriptors of stakeholder collaborations. The collaboration was not limited to a certain community partner but rather encompassed parent support partnership, business and industry partners, education institution partners, and government partners. Parent support groups and business and industry stakeholders, however, were identified as the top two groups that provided support for agriculture programs both at the state and local level.

The stakeholder roles took on three major forms: classroom/instruction support; Supervised Agricultural Experience (SAE) support; and FFA support. In all three areas, stakeholders supported the program financially, with verbal advocacy, and most importantly, by lightening the workload of the agriculture teacher. Since many states have cut or reduced funding to agriculture programs, financial support has become a beacon of hope for the future of agricultural education.

Program advocacy is another key area of support offered for all components (classroom/laboratory, SAE, and FFA) of the agriculture program. One state staff member discussed the agriculture teachers in the state and explained, “they are really surprised at the breadth of adults they are reaching, which I think is a good thing. That communicates a lot to the principal that this guy is not operating or this teacher is not operating on their own.” Their advocacy also plays a major role in keeping the program in the school. Three state staff members mentioned recent examples of how the community partners were the reason a program in their state is still active and thriving.

**Theme 2: Partnership is a Two-Way Street**

In the eyes of the state staff members, the individuals who become involved with agriculture programs in the Northwest are not just stakeholders; they are partners. When discussing industry involvement, a participant referred to the community stakeholders as partners. The individual then elaborated on the comment by saying, “they are partners within the program because they have an active role to play in the success of the total program.” Whether it was parents, business and industry, universities, or government groups, all entities were viewed as partners.

As the first theme described, community partnerships are essential for the agriculture program because they support the students in a multitude of ways. Since partnership is viewed as a two-way street, the state staff members felt like there always was a benefit to the stakeholders as well. One participant stated,

We have something to give them, whether it be labor, whether it be a new perspective on education. They have something to give us whether it be financial support whether it be, umm, skill development, whatever so partnership indicates a two way street and I think, I think if you’re involved in ag. education on either side, you’re going to benefit and that means it is a partnership.
For some stakeholders, this returning benefit is apparent. Stakeholders who provide internships, work experiences, and skill development opportunities are providing a future workforce for their industry. For others, it may simply be an altruistic benefit or the “touchy-feely reasons” as one participant referred to them during the interview. Regardless, the two-way partnerships benefit all parties involved.

Treating stakeholders as partners, where a two-way street exists, can also be a tool for gaining future support for the agriculture program. In the words of one individual, “that concept of partnership is the way you sell, you know, them on being a part of what you’re doing.” When the partners see that their efforts benefit both the future generation of agriculturalist and the business or group they represent, support often skyrockets for the program. In one instance, an individual was recruiting new partnerships for the state FFA Association. Simply by framing the interaction between the FFA and the stakeholder as a partnership, the business decided to invest well over the originally planned $5,000, all because the individual saw the importance of the two-way interaction.

**Theme 3: Partnership is Locally Focused**

The Northwestern United States is geographically diverse, which in turn affects the type of agriculture or natural resource industries that are present in each area. While northern Idaho may focus on dry land wheat production, parts of southern Idaho may emphasize dairy farming as a major industry. Regions in Wyoming, eastern Montana, and Nevada have a major emphasis on the mining, oil, and natural gas industries that are present. In contrast, the same states may have a focus of forestry or cattle ranching in other areas. A common view of agriculture state staff members was that each agriculture program is focused on the needs, wants, and desires of the local community and the industries present. The partnership starts local before expanding to state or national levels.

The local community impacted the stakeholders present, the focus of the entire agricultural education program, and was the determining factor for the roles of formal groups like advisory councils and FFA Alumni’s. When looking at the individual stakeholders present, there was no definitive prescription of what stakeholders needed to be present. In the words of one state staff member,

> If we go down to the local level, I think what you’re going to find is in each individual program and chapter will have their own set of stakeholders that will come through local communities, local experts that are able to come in and talk on a variety of subjects. It is the industries present in the community that determined which local expert is a part of the program.

The local industries also pushed for what coursework is provided at the local program. One state even required proof that the community supported the course offering. The state staff member explained,

> To have a course offered within the state, it’s supposed to represent the needs of the community like in all CTE so we have what is called a skills gap tab that they can either upload and show that the advisory committee has approved the course to be offered in that community and that school, or they just show an employability projection so like you wouldn't need forestry in the middle of [a town] where there’s no trees.
Each participant shared varying protocols for the functions of formal groups like agricultural education advisory councils, FFA Alumni’s, and other support groups. In some areas, a program had a formal advisory council of industry stakeholders and a separate FFA Alumni of supportive parents, each working separately to support the program. In contrast, some programs did not have formal, organized groups or their organized groups served multiple roles. One participant shared how a community of only 300 people in the state had a consolidated advisory council/FFA Alumni that served as one entity. Other programs did not even have a formal group in place. However, the participant did describe what was in place, even if a program did not have a formal group:

If they haven’t created something formal, they all know which parents they can call on to do that so whether it’s a formal setting or an informal setting, all of them have it. You can guarantee that they’ll have all got something that they can or somebody that they can call to help them out when needed.

**Theme 4: Barriers Prevent Collaboration**

While agricultural education state staff members view partnerships as a key to a successful program, they identified that there were barriers that exist when attempting to work with stakeholders. These barriers exist in two major areas: the personality of the teacher and external factors affecting stakeholders. Both provide their challenges when establishing partnerships.

**Agriculture teacher personality**

During each interview, the researcher asked what barriers, if any, existed that prevented partnerships from being established. Without hesitation, the agriculture teacher was mentioned as the number one barrier to establishing close partnerships with community stakeholders. The lack of communication, the personality, and the skills of the teachers emerged as the most common reasons for the barrier.

Communication with the community and school, or lack thereof, emerged as a reason the agriculture teacher is a barrier to collaboration. When asked about the barriers to collaboration, one agricultural education specialist exclaimed,

Can I take it back to the ag. teachers and put the blame on them? And I was one of them for years. A lot of times the partners, stakeholders, groups, whatever you want to call them, they don’t step up and offer because they do not know what an ag. program is, what an ag. program needs, what an ag. program does… And that is the fault of the ag. teacher and ag. program… The way I see it, part of the problem is our fault. They do not know what we have of what we teach or what we are.

Sometimes, state staff members feel as though it may be easier to operate behind a closed door, however, the students suffer as a consequence. One state staff member cited an example where the principal did not know the economic benefits the students were reaping when they sold the market hogs, born and raised on school property. The participants felt that the profession needs to do a better job communicating with others and sharing the agricultural education story.

The personality of some teachers across the northwest also was cited as an attribute of the teachers, barricading effective partnerships in the program. The thought of having someone looking over the teachers shoulder was often cited as an issue. One participant shared the following experience:
One of the things we don't talk about and I remember as a brand-new teacher is I really didn't want people looking over my shoulder because I wasn’t sure what I was doing or what I was doing was very good or right…

In the eyes of the state staff members, agriculture teachers in the Northwest tend to be independent people and often, “they do not want stakeholder groups, any stakeholders whether it’s parents or industry folks or anybody telling them how to run their program and what to do.” This quote came from one individual who witnessed firsthand teachers who operated their programs through this mindset.

The final aspect the teacher displayed, preventing partnership were the skills of the teachers. One participant described the job of an agriculture teacher:

The agriculture education teachers are expected to be the jack-of-all-trades and the master of all! But the reality is, is they are probably the master of very little, and they pretend to be the jack of all.

Because the skills of an agriculture teacher vary, the agriculture teachers can be very guarded as they bring stakeholders into the program. The teacher does not want to look dumb or stupid because they are not experts in a certain area others may expect them to be initially.

Teachers are also not confident in their abilities to get stakeholders involved. One state staff member who worked extensively with teacher professional development described her opinions and stated, “I think that when it comes to advocacy, our teachers don’t have the resources readily available and they don’t feel confident in asking and I think that is true of our community partners as well.” Once teachers experience success, they tend to build the confidence to build more support but until then, it remains as a barrier.

**External factors affecting stakeholders**

Time, finances, and school campus security were three external factors that limited stakeholder involvement. Community partners, just like agriculture teachers, are busy. State staff felt that time availability limited the involvement of the community groups. Finances were also cited as being tight in today’s economic times. The participants felt that more groups would provide financial support if they were more fiscally stable.

The final external factor was the increased security measures on school campuses. Over are the days when state staff members could park by the agriculture shop to do a program visit. All visitors must now be approved through the office. Even facilities that were built with community support needed to operate under similar conditions. As one member stated about a recently opened facility in his state,

When the facilities were built with community partners onboard, they said they wanted it to be this open exchange where community and business leaders could come in, present their problems, collaborate with young fresh minds on how to solve engineering, environmental, and production, fabrication, problems.

In his opinion though, bureaucracy got in the way and prevented the open exchange desired by the community. While all participants agreed the increased security is important for the safety of the students, it is a barrier to collaboration.
Discussion and Recommendations

The agricultural education state staff members viewed community stakeholder-agricultural education program partnerships as essential in today’s education system. The essentiality of program partnerships and the support they offer is consistent with the literature (Decker & Decker, 2003; Epstein, 1995; Epstein et al., 2009; Sanders, 2001). The question does arise, however, if the agriculture teachers view the partners the same way as state staff members. As one participant put it, state staff members often have a view of the state programs from 30,000 feet up; not on ground level where the true collaboration happens. While the state staff members may have a strong handle on all the programs in the state, the researcher recommends that further investigation focus on the views of both the agriculture teacher and the individual stakeholders that influence the programs.

The effect that partnerships have on teacher burnout is another discussion point prompted by the first theme. State staff members believe it to be an essential component of a program because of the tangible and intangible support that is provided to the program. Does this support help to lighten the load of an agriculture teacher, thus keeping him/her in the profession? The researcher recommends further research that begins to investigate if collaboration with program supporters can help alleviate the effects of teacher burnout.

The second theme that emerged from the data was that partnership is a two-way street where both the program and the stakeholders benefit. The interaction between the stakeholders and the program are what make agricultural education unique (Albrecht & Hinckley, 2012). Programs receive financial and curriculum help while the stakeholders get a workforce armed with the skills needed to be successful. While partnerships are beneficial for students, a concern does arise with this scenario. With this two-way street comes the expectation that something is going to be received by the stakeholder in return. This is acceptable when it is purely altruistic or that the stakeholder is investing in a future workforce.

Agricultural education may not be prepared to facilitate partnerships with stakeholders that request a measured outcome, or a quantified return-on-investment. For example, companies who invest in FFA want to see the outcomes from these students and how the industry and company benefit by supporting events. This is an area of concern considering the limited literature on researched based benefits of FFA. Aspects like leadership development and critical thinking skills are difficult to quantify and describe but the agricultural education discipline must continue to focus on telling its story. The researcher recommends continued research on the positive impacts agricultural education can have on students so the discipline can better articulate the benefits offered to students.

This theme also prompts other research topics. Behind each stakeholder exists a unique motivating factor, driving each partner’s involvement in the program. Further research is needed to instigate the motivators behind community partnerships. A better understanding of these motivators could provide the profession insight into building future partnerships.

The third theme was that partnership is locally focused. With such a diverse agricultural spectrum in the region, this emerging theme was encouraging to the profession. Each community is allowing the industry to drive the decision in the program, which is consistent with the
literature (Decker & Decker, 2003; Sanders, 2001; Sanders, 2003). While this is a positive, it does pose a challenge to preservice teacher education. There is no prescribed method of developing community support or what coursework to take to be proficient in certain agricultural areas. The focus must remain on preparing life-long learners that learn as they go rather than entering the job as experts in all areas of agriculture, a mindset that can be difficult to change for universities and teacher certification agencies alike.

The researcher recommends that teacher preparation programs create experiences for preservice teachers to work with community partners. Partnership will remain a vital component of agricultural programs. New and beginning teachers need to begin developing the communication and collaboration skills early in the profession.

The fourth theme identified the barriers that prevent further collaboration. The agriculture teacher was identified as a major barrier to community stakeholder support, which is similar to previous literature (Sanders, 2001). Unfortunately, there may not be a panacea for this barrier. Some aspects that could be useful is that as teachers gain experience, they begin to build their confidence to build community support. Also, success breeds success in this instance. As agriculture teachers begin to reach out to stakeholders and experience success, they become more confident as they reach out to more stakeholders. While professional development and increased undergraduate curriculum on building community partnerships may be helpful, the result of the study suggest that experience is what builds the skills needed to collaborate with stakeholders. Again, professional development for teachers and teacher educators is recommended to encourage confidence and skill building in the area of community partnerships.

The external barriers were also consistent with the previous findings of Decker and Decker (2003), Dryfoos (1998), and Sanders (2001). Time, finances, and school clearances all prevent further collaboration between the program and stakeholders. Agriculture teachers need to be more proactive in assisting stakeholders to develop creative ways to assist the program. Even if a local agribusiness cannot provide finances, they may be able to provide a discounted service or allow the program to temporarily use equipment needed for a project. To help overcome these barriers, creative solutions need to be developed so that all interested stakeholders can find a way to become involved.

**Conclusion**

As stated by one of the state staff members, “if the whole ag. community is not a part of agricultural education, then we are going to have problems down the road.” It is the stakeholders who provide rigor and relevance to the classroom/laboratory instruction, SAE, and FFA components of the agriculture program. While this study did provide insight into the current views on community support for agricultural education programs in the Northwestern United States, further research and teacher development is needed to create a more elaborate patchwork of stakeholders to ensure a fertile future for agricultural education.

**References**


Tillinghast, S., Ramsey, J. W., & Terry, R. (2013, October). Teacher perceptions of adult volunteers serving local, school-based agricultural education programs. Paper presented at the Western region meeting of the American Association for Agricultural Education, Lubbock, TX.

Adult Volunteer Perceptions: Providing Service to Local, School-based Agricultural Education Programs

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Abstract

Volunteers provide valuable service to organizations such as FFA, Boy Scouts of America, and 4-H. These organizations often rely on volunteers to be successful. The purpose of this study was to describe the assimilation of adult volunteers with school-based agricultural education programs in Oklahoma. Specifically, this study sought to determine volunteer perceptions of efforts to recruit, train, and reward volunteers. Volunteers are motivated to serve school-based agricultural education programs because of their desire to interact with youth and give back to the FFA. While some volunteers did not recognize any obstacles to volunteering, many cited work and family obligations as a barrier. They frequently served in direct, point-of-service, activities such as general labor and transportation of livestock; however, volunteers reported they never served in roles related to the classroom. While some volunteers received formal training in volunteerism, many were provided with either informal training or none at all. Volunteers preferred to be rewarded with simple gestures of appreciation rather than large scale recognition programs. We recommend volunteers seek more active participation in the entire agricultural education program. Further, we encourage the National FFA Organization to develop training and specific rewards for those who serve the programs.

Introduction/Theoretical Framework

According to the National FFA Organization (2014a), agricultural education teachers are responsible for carrying out a variety of roles to establish and maintain a successful local agricultural education program. The execution of these roles has the potential to increase demand on teacher workload and place constraints on adequately meeting the needs of the students (Tillinghast, Ramsey, & Terry, 2013). The National FFA Organization (2013) reported another annual surge in active members with current membership just under 580,000 members. In Oklahoma, similar growth has been reported with membership reported at over 25,000 FFA members during the 2013-2014 school year (K. Short, personal interview, March 3, 2014).

One way to adequately meet the needs of students and agricultural education teachers is to utilize volunteers. Terry, Harder, and Pracht (2011) posited the ability for organizations to meet their mission, goals and objectives depends on the effectiveness of volunteer involvement. Hartenian (2007) stated volunteers possess important resources for organizations: time, talent, and information. While few studies have been conducted on volunteerism in school-based agricultural education, volunteers can benefit such programs by helping to better meet the needs of students (Seevers & Rosencrans, 2001).

Motivation has been emphasized in behavioral research throughout the past fifty years (Fritz, Barbuto, Marx, Etling, & Burrow, 2000). Effective utilization of volunteers depends on
understanding what motivates these individuals to volunteer (Murk & Stephan, 1990). According to Balenger, Sedlacek, and Guenzler (1989), volunteers serve because they expect certain motivational needs to be met during the process or act of volunteering. Those most ready to volunteer traditionally have a history of volunteering (Culp, 1996). Zeutschel and Hansel (1989) found the primary motivator for initiating volunteer service was having children involved in that organization. Similarly, Culp (1997) posited parents first and foremost volunteer in capacities benefiting their children. Volunteer motives for continuation of volunteer service primarily stem from interaction with youth, loyalty to the organization, and feeling needed (Fritz et al., 2000). Ultimately, identifying and illuminating these motivators is only one means of trying to inspire volunteer involvement (Culp, 1997).

In addition to positive motivators to begin volunteer service, there are negative motivators, or barriers, to volunteering more. Additionally, volunteers may decide to even discontinue their volunteer service (Culp, 1997). According to Culp (1997), the majority of volunteers in youth organizations discontinue their volunteer service due to feelings of being unwanted or unneeded, time conflicts, or kids leaving the organization. While the literature does not specifically speak to volunteering less or more, the same motivators for discontinuing volunteer service certainly could be affecting the level of participation.

Volunteer roles in school-based agricultural education programs have been studied on a limited basis (Tillinghast et al., 2013). Elliot and Suvedi (1990) found that for agricultural education programs in Michigan, volunteers primarily served on advisory committees and assisted with field trips, supervised agricultural experience (SAE) programs, and FFA leadership activities. Seevers and Rosencrans (2001) identified chaperoning, coaching CDE events, and assisting with FFA activities to be the top three services provided by volunteers in New Mexico. Tillinghast et al. (2013) found livestock shows, fundraising, general labor, and chaperoning to be the primary roles of volunteers in Oklahoma agricultural education programs. While these assignments are helpful to teachers, a question remains: Are volunteers and their assortment of talents used effectively by agricultural education teachers and FFA advisors? (Tillinghast et al., 2013).

Elliot and Suvedi (1990) recommended volunteers get involved in classroom and laboratory instruction, guidance and counseling, and recruitment. Other youth organizations, such as 4-H and Boy Scouts of America (BSA) have found ways to utilize volunteers in all aspects of the organization, including leadership and mentoring roles. The Cooperative Extension program in the United States considers volunteers to be critical to the success of youth development and educational programs (Boyd, 2004). BSA has reported their adult volunteer population to be well over 1.2 million (Boy Scouts of America, 2014a). Since these two agencies rely on countless volunteers, many hours are spent recruiting, training, and rewarding people who serve (Boy Scouts of America, 2012a, 2012b; Boyd, 2004).

Seevers and Rosencrans (2001) said, “Despite the belief that volunteer involvement should increase, there is still a question of how fully the potential is being realized” (p. 73). Seevers and Rosencrans (2001) also posited the potential for volunteers to be more fully integrated into school-based agricultural education exists through proper training and retention methods. Volunteers need guidance during their service to make sure they focus their efforts in the right
direction (Boyd, 2003). Training programs provide individuals with the tools they need to successfully serve in the context of volunteerism (Culp & Kohlhagen, 2004).

Fritz et al. (2000) said, “Attention to recognition of volunteers can be the difference between retaining or not retaining volunteers” (p. 42). Volunteers desire to be appreciated and recognized for their service (Culp & Schwartz, 1999). Recognition of these volunteers is essential to the success of the school-based agricultural education program (Tillinghast et al., 2013).

Henderson (1981) stated the primary reasons for volunteerism were affiliative, or linked to a relationship with another person. With this in mind, Penrod (1991) argued the recognition of volunteers is most meaningful when it is linked to their motivation patterns. Culp and Schwartz (1999) then concluded the most meaningful types of recognition in extension education to be thank you notes and letters from youth, which are linked to the relationship the volunteer formed with the youth. Not all types of recognition have been found to be affective (Fritz et al., 2000). Some types of recognition may not appeal to all volunteers (Culp & Schwartz, 1999). Furthermore, volunteers indicated any type of communication with the volunteer administrator, such as a phone call or visit, is the least appealing form of reward (Fritz et al., 2000).

In order to better understand what influences people to volunteer, Herzberg’s Motivator-Hygiene Theory served as a theoretical frame for this study. Herzberg separated factors affecting people into two categories: hygiene factors and motivator factors (Herzberg, Mausner, & Snyderman, 1959). Adler (1991) suggested the needs in each factor were related to those posited by Maslow (1954) in his famous Hierarchy of Needs. However, Herzberg challenged the notion that dissatisfaction is the opposite of satisfaction; instead, the two are independent phenomena (Foor & Cano, 2011; Ricketts & Ricketts, 2011). Herzberg et al. (1959) theorized motivator factors (higher-level needs such as achievement, recognition, responsibility, advancement, and work itself) and hygiene factors (conditions and practices that promote or preserve health or psychological well-being) affect a person’s self-efficacy. This self-efficacy and factors affecting one’s impetus to volunteer must be balanced at all times to keep volunteers motivated and involved (Kempton, 1980).

Herzberg et al. (1959) called the most basic level of needs hygiene factors. These basic levels of needs are associated with lower order necessities such as physiological and safety needs (Adler, 1991). Hygiene factors have been found to be essential for preventing dissatisfaction, but have little impact on generating non-monetary satisfaction (Pinder, 1984). Factors such as safe working conditions and job security can reduce dissatisfaction, but satisfaction will not necessarily increase (Herzberg et al., 1959).

The second set of needs is termed motivator factors, which are called growth needs (Herzberg et al., 1959). These factors are primarily associated with higher order needs, similar to Maslow’s need levels of social, esteem, and self-actualization (Adler, 1991). According to Pinder (1984), motivator factors cause feelings of growth and personal development in the context of the job or experience. Motivator factors tend to promote long-lasting experiences and satisfaction (Pinder, 1984). According to the theory, satisfaction and motivation are affected only by the motivators (Herzberg et al., 1959); therefore, individuals can be happy about aspects of their job, while simultaneously being unhappy about other aspects (Foor & Cano, 2011).
In addition to the Motivator-Hygiene Theory, the Expectancy-Value Theory was used as a conceptual prism to better understand the use of volunteers in school-based agricultural education programs. Schunk, Pintrich, and Meece (2008) concluded, “Expectancies are peoples’ beliefs and judgments about their capabilities to perform a task” (p.44). Values refer to the belief people have about the reasons they serve in a specific role (Schunk et al., 2008). According to Schunk et al. (2008), expectancies and values influence achievement choices. Wigfield and Eccles (2000) posited these two factors also influence effort, persistence, and performance. However, expectancy is not considered motivation alone (Schunk et al., 2008). Expectancy must be coupled with value to provide encouragement to engage in the task (Franken, 2007).

According to Eccles (2007), the value placed on a task is based on attainment value, intrinsic and interest value, utility value, and cost. Attainment value represented the desire to do well on a particular task, while intrinsic and interest value is possessed by those who seek direct enjoyment from task engagement (Wigfield & Eccles, 2000). Utility value is the importance level assigned to a task by an individual, which can be powerful enough to outweigh negative expectancy (Eccles, Adler, Futterman, Goff, Kaczala, Meece, & Midley, 1983). Cost described what one must give up to complete the task and the time and energy lost by participating (Eccles, 2007). For example, volunteers in agricultural education programs potentially could be gone overnight to livestock shows or chaperoning students at regional or national conferences.

**Purpose/Objectives**

The purpose of this study was to describe the assimilation of adult volunteers with school-based agricultural education programs in Oklahoma. This study specifically sought to determine volunteer perceptions of efforts to recruit, train, and reward volunteers. The specific objectives of this study were to:

1. Determine motivation factors of adult volunteers who serve in school-based agricultural education programs.
2. Determine barriers to volunteering in school-based agricultural education programs as perceived by adult volunteers.
3. Identify volunteer roles in school-based agricultural education programs as perceived by adult volunteers.
4. Identify how adult volunteers are prepared to serve school-based agricultural education programs.
5. Identify how adult volunteers are recognized for their service to school-based agricultural education programs.

**Methods/Procedures**

This study, as part of a larger investigation, was descriptive in design and employed a sample of convenience. Data were collected at the 2013 Oklahoma Youth Expo, a nonprofit program partnership with the Oklahoma Department of Agriculture Food and Forestry and a variety of other institutions, organizations, and sponsors (Oklahoma Youth Expo, 2014). Participants completed an electronic questionnaire using networked iPads to respond to items associated with the objectives of this study. Volunteer data collectors were trained to identify and engage
subjects for the study, including rules and regulations for collecting data in accordance with the Institutional Review Board at Oklahoma State University.

The data collection instrument was developed by the researchers and contained six sections. Section One of the instrument included statements to assess adult volunteers’ motivation factors for volunteering in agricultural education programs. A five-point Likert scale (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree) was used. Section Two sought to determine the barriers to volunteering for adult volunteers. Checkboxes were provided for respondents to indicate multiple barriers. Section Three sought to determine what volunteer roles are most commonly assumed in association with school-based agricultural education programs. Respondents were asked to indicate the frequency in which they served in each role using a four-point Likert scale (Never, Seldom, Occasionally, Frequently). Section Four of the instrument was designed to identify methods used to train volunteers serving agricultural education programs. Like the second section, checkboxes were provided for respondents to indicate multiple training methods. The fifth section addressed ways in which volunteers preferred to be rewarded for their service. Respondents were asked to rank eight forms of recognition in terms of most appealing. The final section of the instrument consisted of designed items to obtain demographic information about the respondents.

The instrument was created using Qualtrics, an online data collecting software. Face and content validity were assessed by a panel of experts consisting of seven faculty in the Oklahoma State University Department of Agricultural Education, Communications, and Leadership and three Ph.D. candidates in agricultural education. The pilot test, taken by 27 sophomore and junior level agricultural communications students, resulted in no adjustments being made to the instrument. A total of 69 adult volunteers served as subjects for the study. Because a sample of convenience was used and it represents a small portion of the volunteer population at the Oklahoma Youth Expo, results should not be generalized to the unknown number of adult volunteers in school-based agricultural education programs (Creswell, 2012).

Data associated with personal characteristics were nominal in nature and were analyzed using frequencies and percentages. Measures of central tendency were utilized to analyze data associated with volunteers’ perceptions regarding their service to agricultural education and FFA. According to Jamieson (2004), ordinal response scales can be employed to categorize responses with a rank order, however, the “intervals between values cannot be presumed equal” (p. 1217). In addition, Gay, Mills, and Airasian (2006) stated that when choosing a measure of central tendency to analyze data, the mean is only “appropriate when the data represent either an interval or ratio scale” (p. 308). Similarly, Miller (1998) described use of mean scores to term nominal and ordinal data as “nonsensical” (p. 2). Data generated from this study are both nominal and ordinal; therefore, the measures reported are frequencies and modes.

Results/Findings

Selected Characteristics of Respondents
Respondents of this study were adult volunteers in Oklahoma agricultural education programs who were part of a convenience sample. Fifty-seven percent (39) of the respondents were female. Age ranged from 18 to 69 years with the average being 38 years. The number of children each
respondent has ranged from 0 to 7 with the average being just under 2 children. Of those reported with children, the average number of children who are past, current, and future FFA members was 0.84, 1.91, and 2.14 respectively.

**Objective One**
The first objective was to determine motivation factors of adult volunteers who serve in school-based agricultural education programs. Table 1 displays 12 statements used to assess the motivation factors of adult volunteers.

<table>
<thead>
<tr>
<th>Motivators</th>
<th>SD</th>
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<tbody>
<tr>
<td>Want to make a positive difference in the lives of young people</td>
<td>0 0.00</td>
<td>0 0.00</td>
<td>3 4.35</td>
<td>24 34.78</td>
<td>42 60.87</td>
<td></td>
</tr>
<tr>
<td>Want to teach young people</td>
<td>2 2.90</td>
<td>3 4.35</td>
<td>5 7.25</td>
<td>22 31.88</td>
<td>37 53.62</td>
<td></td>
</tr>
<tr>
<td>Enjoy helping others</td>
<td>0 0.00</td>
<td>1 1.45</td>
<td>3 4.35</td>
<td>30 43.48</td>
<td>35 50.72</td>
<td></td>
</tr>
<tr>
<td>Want to give back to the FFA</td>
<td>0 0.00</td>
<td>1 1.45</td>
<td>6 8.70</td>
<td>27 39.13</td>
<td>35 50.72</td>
<td></td>
</tr>
<tr>
<td>Want the opportunity to interact with my own children</td>
<td>6 8.70</td>
<td>1 1.45</td>
<td>7 10.14</td>
<td>20 28.99</td>
<td>35 50.72</td>
<td></td>
</tr>
<tr>
<td>Express care for others</td>
<td>0 0.00</td>
<td>1 1.45</td>
<td>7 10.14</td>
<td>30 43.48</td>
<td>31 44.93</td>
<td></td>
</tr>
<tr>
<td>Express concern for others</td>
<td>0 0.00</td>
<td>0 0.00</td>
<td>12 17.39</td>
<td>32 46.68</td>
<td>25 36.23</td>
<td></td>
</tr>
<tr>
<td>Feel needed in the program</td>
<td>1 1.45</td>
<td>1 1.45</td>
<td>16 23.19</td>
<td>32 46.38</td>
<td>19 27.54</td>
<td></td>
</tr>
<tr>
<td>Enjoy interacting with other volunteers</td>
<td>0 0.00</td>
<td>2 2.90</td>
<td>13 18.84</td>
<td>30 43.48</td>
<td>24 34.78</td>
<td></td>
</tr>
<tr>
<td>Feel needed by the agricultural educator / FFA Advisor</td>
<td>1 1.45</td>
<td>4 5.80</td>
<td>15 21.74</td>
<td>30 43.48</td>
<td>19 27.54</td>
<td></td>
</tr>
<tr>
<td>Cannot say “no” when asked</td>
<td>5 7.25</td>
<td>9 13.04</td>
<td>18 26.09</td>
<td>21 30.43</td>
<td>16 23.19</td>
<td></td>
</tr>
<tr>
<td>Want to be involved in more leadership-type roles</td>
<td>2 2.90</td>
<td>2 2.90</td>
<td>23 33.33</td>
<td>22 31.88</td>
<td>20 28.99</td>
<td></td>
</tr>
</tbody>
</table>

*Note. SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree Mode in Bold*

The modal response is displayed in boldface. Respondents strongly agreed with one-half of the motivation factors surveyed including “Want to make a positive difference in the lives of young
people,” “Want to teach young people,” and “Want to give back to the FFA.” Just over 50% of respondents strongly agreed they desired to interact with their children. Volunteers also indicated they were positively motivated by feeling needed in the program and by the agricultural educator/FFA Advisor. The modal response of neutral resulted from the item asking if respondents were motivated by the opportunity to be more involved in leadership roles.

Objective Two
The second objective sought to determine barriers to volunteering in school-based agricultural education programs as perceived by adult volunteers. Respondents were provided 11 statements regarding barriers to volunteering (see Table 2). Nearly 90% of the volunteers indicated they were restricted from volunteering or volunteering more by either work or family obligations. Interestingly, just under one-fourth of the respondents did not see any barriers to volunteering in school-based agricultural education. Several barriers received a single response; these four barriers are rooted in lack of support and getting along with either the agricultural education teacher or other volunteers.

Table 2
Barriers to Volunteering in Agricultural Education Programs (N = 69)

<table>
<thead>
<tr>
<th>Barriers</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have work obligations</td>
<td>41</td>
<td>59.42</td>
</tr>
<tr>
<td>I have family obligations</td>
<td>20</td>
<td>28.99</td>
</tr>
<tr>
<td>There are none</td>
<td>17</td>
<td>24.64</td>
</tr>
<tr>
<td>Lack of organizational commitment by the chapter / program</td>
<td>11</td>
<td>15.94</td>
</tr>
<tr>
<td>Lack of training for volunteers</td>
<td>5</td>
<td>7.25</td>
</tr>
<tr>
<td>Lack of volunteer management skills by the administrator</td>
<td>3</td>
<td>4.35</td>
</tr>
<tr>
<td>I have health or medical problems</td>
<td>2</td>
<td>2.90</td>
</tr>
<tr>
<td>Volunteer administrator (advisor) has too many other responsibilities than volunteer administration</td>
<td>1</td>
<td>1.45</td>
</tr>
<tr>
<td>Volunteer administrator does not support volunteerism</td>
<td>1</td>
<td>1.45</td>
</tr>
<tr>
<td>I do not get along with the volunteer administrator</td>
<td>1</td>
<td>1.45</td>
</tr>
<tr>
<td>I do not like the volunteers in the organization</td>
<td>1</td>
<td>1.45</td>
</tr>
</tbody>
</table>

Note. Volunteers were allowed to select all training methods that applied.

Objective Three
The third objective looked to identify roles most often assumed by adult volunteers in school-based agricultural education programs. Adapted from Seevers and Rosencrans’ (2001) instrument, respondents were provided 18 roles volunteers could potentially assume with agricultural education programs. As shown in Table 3, only two roles were found to have the modal response of frequently: “General labor” and “Transport animals/tack to livestock shows.” More than half of the respondents indicated they occasionally participated as volunteers during fundraising activities. Additionally, more than 40% of volunteers said they occasionally participated in recruiting, transportation, and chaperoning-type activities. A modal response of never was found for nine of the roles.
Table 3
Roles of Volunteers in Agricultural Education Programs (N = 69)

<table>
<thead>
<tr>
<th>Roles</th>
<th>N</th>
<th>S</th>
<th>O</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Labor</td>
<td>1</td>
<td>13</td>
<td>21</td>
<td>34</td>
</tr>
<tr>
<td>Transport animals/tack to livestock shows</td>
<td>4</td>
<td>7</td>
<td>27</td>
<td>31</td>
</tr>
<tr>
<td>Fundraising</td>
<td>4</td>
<td>7</td>
<td>35</td>
<td>23</td>
</tr>
<tr>
<td>Recruiting other volunteers</td>
<td>11</td>
<td>17</td>
<td>33</td>
<td>8</td>
</tr>
<tr>
<td>Provide transportation to FFA events</td>
<td>7</td>
<td>8</td>
<td>32</td>
<td>22</td>
</tr>
<tr>
<td>Chaperones</td>
<td>16</td>
<td>8</td>
<td>28</td>
<td>17</td>
</tr>
<tr>
<td>Provide/assist with meal functions</td>
<td>11</td>
<td>14</td>
<td>27</td>
<td>17</td>
</tr>
<tr>
<td>Recruit future FFA members</td>
<td>19</td>
<td>24</td>
<td>18</td>
<td>8</td>
</tr>
<tr>
<td>Provide technical assistance for student SAEs</td>
<td>15</td>
<td>23</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>Administrative/Office Support</td>
<td>49</td>
<td>17</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Unpaid classroom instructor (substitute, teacher’s aide)</td>
<td>49</td>
<td>11</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Coaching CDE teams</td>
<td>45</td>
<td>12</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Unpaid classroom guest speaker/lecturer</td>
<td>37</td>
<td>17</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>Coordinate FFA events</td>
<td>35</td>
<td>14</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Judge FFA events</td>
<td>34</td>
<td>14</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>Assist with FFA award applications</td>
<td>33</td>
<td>19</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Program advisory committees</td>
<td>30</td>
<td>17</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>Supervision of student SAEs</td>
<td>27</td>
<td>18</td>
<td>18</td>
<td>6</td>
</tr>
</tbody>
</table>

Note. N = Never, S = Seldom, O = Occasionally, F = Frequently
Mode in Bold

Objective Four
The fourth objective inquired about how volunteers are prepared to serve school-based agricultural education programs. Respondents were asked to indicate the training method used to prepare them for their volunteer roles. Participants were also encouraged to select all training methods that applied to their individual situation. Ultimately, the nominal data collected for this objective indicated more than one-third of the volunteers received no training prior to serving as a volunteer. More than two-thirds of the respondents also indicated the training they did receive was primarily on an individual basis. Only seven of the adult volunteers identified their volunteer training as coming from someone with the FFA other than the agricultural educator. Additionally, only three took a formal class on volunteerism. Both of these types of training possess a formal structure and established process for preparing volunteers for their service to agricultural education programs.
Table 4
*Training Provided to Volunteers in Agricultural Education Programs (N = 69)*

<table>
<thead>
<tr>
<th>Type of training</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>I received no training</td>
<td>26</td>
<td>37.68</td>
</tr>
<tr>
<td>The agricultural educator provided instruction to me, individually</td>
<td>25</td>
<td>36.23</td>
</tr>
<tr>
<td>Others associated with the FFA instructed me, individually</td>
<td>24</td>
<td>34.78</td>
</tr>
<tr>
<td>I participated in volunteer training conducted by an organization other than the</td>
<td>17</td>
<td>24.64</td>
</tr>
<tr>
<td>FFA (4-H, school, church, Boy Scouts of America)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The agricultural educator conducted a program for a group of volunteers</td>
<td>9</td>
<td>13.04</td>
</tr>
<tr>
<td>Other individuals with the FFA conducted a program for a group of volunteers</td>
<td>7</td>
<td>10.14</td>
</tr>
<tr>
<td>I took a formal class on volunteerism from an educational institution</td>
<td>3</td>
<td>4.35</td>
</tr>
</tbody>
</table>

*Note.* Respondents were allowed to select all training methods that applied

**Objectives Five**

The fifth objective sought to identify how adult volunteers are rewarded for their service to school-based agricultural education programs. Respondents ranked eight forms of recognition based on their individual preferences from one to eight with one being the most appealing and eight being the least appealing. Table 5 shows the distribution of ranking choices based upon the frequency and percentage each form of recognition was chosen for a given ranking.

Nearly 50% of the respondents indicated a “Letter from FFA member” as the most appealing form of volunteer recognition. Additionally, respondents found a “Phone call” and “Visit from FFA Advisor” to be among the three most appealing methods of recognition. “Letter from FFA Advisor” and “Receiving plaques, certificates, pins” were identified as the fourth and fifth most appealing reward for their volunteer service. The remaining three forms of recognition, “Formal recognition,” “Nominated for awards/recognition through FFA,” and “Coverage in the newspaper,” considered more formal than the top forms of recognition, were found to be the least preferred methods of rewarding volunteers. Due to participant error, only 64 participants responded to this section of the questionnaire.
Table 5
Preferred Methods of Rewarding Volunteers in Agricultural Education Programs (N = 64)

<table>
<thead>
<tr>
<th>Type of Recognition</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter from FFA member</td>
<td>29</td>
<td>45.31</td>
<td>8</td>
<td>12.50</td>
<td>12</td>
<td>18.75</td>
<td>6</td>
<td>9.38</td>
</tr>
<tr>
<td>Phone Call</td>
<td>14</td>
<td>21.88</td>
<td>12</td>
<td>18.75</td>
<td>11</td>
<td>17.19</td>
<td>7</td>
<td>10.94</td>
</tr>
<tr>
<td>Visit from FFA Advisor</td>
<td>4</td>
<td>6.25</td>
<td>17</td>
<td><strong>10.94</strong></td>
<td>11</td>
<td>17.19</td>
<td>9</td>
<td>14.06</td>
</tr>
<tr>
<td>Letter from FFA Advisor</td>
<td>1</td>
<td>1.56</td>
<td>9</td>
<td>14.06</td>
<td>18</td>
<td><strong>28.13</strong></td>
<td>14</td>
<td>21.88</td>
</tr>
<tr>
<td>Receiving plaques, certificates, and/or pins</td>
<td>6</td>
<td>9.38</td>
<td>6</td>
<td>9.38</td>
<td>4</td>
<td>6.25</td>
<td>9</td>
<td>14.06</td>
</tr>
<tr>
<td>Formal recognition (banquet, meeting, etc.)</td>
<td>7</td>
<td>10.94</td>
<td>8</td>
<td>12.50</td>
<td>3</td>
<td>4.69</td>
<td>7</td>
<td>10.94</td>
</tr>
<tr>
<td>Nominated for awards/recognition through FFA</td>
<td>1</td>
<td>1.56</td>
<td>1</td>
<td>1.56</td>
<td>3</td>
<td>4.69</td>
<td>9</td>
<td>14.06</td>
</tr>
</tbody>
</table>

*Note. Respondents were instructed to place the eight types of recognition in rank order from 1-8; Mode in Bold*
Conclusions, Recommendations and Discussion

Volunteers who participated in this study are motivated to serve school-based agricultural education for a variety of reasons. Volunteers are driven to help others and make a difference in their community. In agreement with the findings of Fritz et al. (2000), we conclude volunteers desire to give back to the FFA. In addition, they expressed agreement with being motivated in some aspects by a feeling of need. Volunteers sought chances to impact the agricultural education program through direct contact with youth; therefore, opportunities to serve in leadership roles in the context of the program were not a strong motivational factor.

Many volunteers suggested there were no significant barriers to volunteering in agricultural education programs. Conversely, the vast majority of volunteers cited higher-priority obligations as a restriction to volunteering in general or volunteering in a greater capacity. Very few volunteers see their health or lack of training as a barrier. Volunteers see a program’s level of commitment as a potential barrier; however, their relationship with the agricultural education teacher or other volunteers does not deter them from seeking volunteer opportunities. Volunteers are encouraged to express their concerns regarding the direction of the program to the agricultural education teacher. If their concerns or perceived barriers to volunteering are shared, long-term volunteer dissatisfaction may be avoided.

The roles most frequently assumed by volunteers are direct service, or point-of-service, activities (Hartenian, 2007). One-half of the 18 provided roles, such as supervising SAEs and coordinating FFA events, were never assumed by the respondents. Elliot and Suvedi’s (1990) recommendations for volunteer involvement in the classroom were found to not be a form of service in Oklahoma agricultural education programs. One reason for this finding may be that teachers see this task as easier to complete on their own or with students rather than adult volunteers. Some of the roles volunteers could potentially undertake may be tasks they are not comfortable assuming. Eccles (2009) recommended volunteers ask themselves, “Do I want to do the task” and “Can I do the task” (p. 1). Ultimately, the value of a volunteer experience must outweigh the perceived expectancy, or success, of serving as a volunteer in a specific area.

According to Eccles (2009), volunteers will be motivated to serve in roles they find interesting. Volunteers are encouraged to express their interests to agricultural education teachers and other volunteer administrators. Additionally, if a volunteer is not interested in a certain role, they should make it known. Herzberg et al. (1959) suggested that negative experiences will lead to dissatisfaction in the workplace. If interests of a volunteer are met, the volunteer is more likely to achieve higher levels of satisfaction, which leads to continued, long-term volunteering. This increased state of satisfaction ultimately increases one’s self-efficacy in both the workplace and service sector (Herzberg et al., 1959).

Volunteers who participated in this study frequently assumed only one-ninth of the roles included in this investigation. Data indicate respondents either do not know about the roles they can accept or are simply choosing to not take full advantage of all opportunities within the agricultural education program. The researchers have observed this lack of volunteer involvement during their combined years of teacher and volunteer observation. Other youth organizations such as BSA and 4-H rely heavily on volunteer service (Boy Scouts of America, 2003; Fritz et al., 2000). Perhaps volunteers interested in serving school-based agricultural
education programs should solicit the agricultural education teacher to make all service opportunities known to them and others interested in helping.

Data indicate little to no training of volunteers is occurring in Oklahoma agricultural education programs. Volunteers are primarily instructed on what needs to be done by either the teacher or fellow volunteer using informal training methods. The National FFA Organization (2014b) has a self-guided volunteer module and a website dedicated to volunteerism. Teacher educators and state staff should highlight this website and other agricultural education volunteer resources and model the training protocol used by BSA. According to BSA (2012b), adult volunteers are expected to complete training programs in order to work with youth. Similar programs could easily be developed in the context of agricultural education. In particular, the Youth Protection training program offered by BSA should be implemented for all adults interacting with FFA members (Boy Scouts of America, 2014b). This program focuses on appropriate ways adults are to interact with youth as well as how to recognize and report instances of abuse.

According to the expectancy-value theory, rewarded activities are more likely to attain sustained participation (Eccles, 2007). Results of this study indicate volunteers prefer simple, informal types of recognition (e.g. letters and phone calls). Even though some volunteer recognition programs exist in the FFA, we recommend more platforms for volunteer recognition be developed. The website, Awards Central (Boy Scouts of America, 2012a), lists more than 60 different awards BSA volunteers can earn. Therefore, we encourage agricultural education teachers to seek unique, potentially specialized, ways to honor volunteer contributions at the local level. Also, the National FFA Organization, due to its access to sponsors and stakeholders, could assist FFA advisors with developing a local volunteer recognition program.

We recognize the narrow application of the findings and conclusions of this study due to the sampling process used. We believe, however, functional information from the study provides valuable insight into the current needs in local, school-based agricultural education programs. We recommend a study with similar objectives be conducted using sampling techniques allowing conclusions and recommendations to be generalized to a broader profile of the volunteer population serving school-based agricultural education. Additionally, research should be conducted specifically related to volunteer training methods and recognition programs.

References


Dexterity: An Indicator of Future Performance in Beginning Welders?

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Richard T. Stone, Iowa State University
Ryan G. Anderson, Iowa State University

Abstract

This study examined the use of dexterity to indicate future performance of beginning welders to select participants for welding training programs. With a high demand for welders, it is imperative that welding training programs be efficient, which can be time consuming (Stone, Watts, & Zhong, 2011). The time required to train certified welders is one of the obstacles training programs face. Many occupational fields have tried to predict a student’s future performance before admitting them into a training program by analyzing their dexterous ability. This study utilized the Complete Minnesota Dexterity Test (CMDT) to examine participants’ dexterity during a welding training program. At the end of the training program, participants performed tests welds that were overseen by a certified welding instructor (CWI) who visually inspected each weld. The data from the dexterity tests and the pass/fail rate of the test welds were analyzed using Predictive Analytics SoftWare (PASW) Statistics 18 software package. All three dexterity tests were found to have statistically significant relationships with the visual pass/fail rates of the participants for basic shielded metal arc welds (SMAW). It can be concluded that dexterity can predict future performance of beginning welders completing basic SMAW welds.

Introduction

Due to a global boom in the industrial manufacturing sector welders are in greater need now than ever before (Brat, 2006). According to the U.S. Department of Labor, Bureau of Labor Statistics (2012), the number of jobs for welders is expected to increase 15% from 2010 to 2020, which is as faster than all other occupational fields reported. Welding is a technical skill that requires its practitioners to be certified, which takes time, money, and talent (Stone, Watts, & Zhong, 2011). The time that is needed to train a person to become certified to weld is one of the areas that many welding educators have tried to shorten. According to Giachino and Weeks (1985), for a skilled manual welder to master the craft requires years of on-the-job training. It is this concern, expressed by many companies, of extensive training after recruitment and the failure of trainees to achieve acceptable standards that have led to the high interest in trainability testing (Hitchings & Moore, 1991).

Since its inception, welding training programs have been continually evolving to better prepare welders. Weld trainers have incorporated several computer-based advancements into their programs such as virtual reality simulators (Byrd & Anderson, 2012). Simulations have been used in several occupational fields such as medical, dental, and welding to train students to become proficient at various skills (Boulet et al., 2003; Kunkler, 2006; Papadopoulos, Pentzou, Louloudiadis, & Tsiatosos, 2013; Stone et al., 2011) The use of virtual reality simulators have helped increase the awareness of welding to the younger gaming generation (Postlethwaite, 2012). With a majority of learning and interaction occurring in a digital environment virtual reality simulators creates an avenue to recruit new students (Lincoln Electric, 2013). With this
influx of newcomers to training programs is there a way to predict which people will have the best capability to weld?

Many occupations have tried to predict a student’s ability of future performance prior to admitting them into a training program. The typical tests that have been utilized to predict future performance analyze cognitive ability, psychomotor skills, and perceptual tests (Gettman et al., 2003; Levine, Spector, Menon, & Narayanan, 1996; Hitchings & Moore, 1991; Brown & Ghiselli, 1951). Dental and surgical training programs have conducted studies examining how effective these aptitude tests are at predicting future performance. A study by Gettman et al. (2003) shown that the measures of innate ability were able to accurately predict the future performance of 65% of laparoscopic surgeons (N=20). Gansky et al. (2004) found that manual dexterity was able to predict future performance of dental students in subsequent preclinical restorative courses.

One factor that has been studied to examine the ability to predict future performance is dexterity. According to Campbell (2007), dexterity is the skill of using one’s hands and body, which addresses the quickness or the coordination of sight, and other senses, with muscles. Dexterity has been validated in predicting performance in jobs that require routine assembly, coil winding, and packaging than on jobs that require higher order abilities (Hitchings & Moore, 1991; Levine et al., 1996; Mansell, 1969). Because welders are required to routinely perform many welds that require higher order thinking skills to complete can dexterity be able to predict performance in a welder?

Welding literature has stated that welders need manual dexterity, good eyesight, and good hand-eye coordination (Giachino & Weeks, 1985; Jeffus, 2012; Jeffus & Bower, 2010a). Giachino and Weeks (1985) also stated that welders need the ability to concentrate on detailed work, be free of disabilities that would prevent work in awkward positions. To evaluate these criteria welder training programs have employed tests that evaluate mechanical ability, ability to judge shapes and sizes, remember designs, and manual dexterity when selecting apprentices (Fleming, 1937), but have not extensively evaluated the predictive ability of individual factors for future performance.

Mansell (1969) stated that technical teachers are mostly concerned with trainee knowledge and dexterity. Mansell (1969) also stated that to teach dexterity of a skill an analysis of the skill must first be completed because every skill has sub-skills that must also be known. Using dexterity and trainability testing techniques require the tests be designed around the skills of the particular job being studied (Hitchings & Moore, 1991).

A few of the welding parameters that a welder is required to maintain during the welding process are arc length, weld position, travel angle, work angle, and travel speed (Jeffus, 2012; Jeffus & Bower, 2010a). These parameters are crucial in order for the welder to correctly weld two pieces of material together. In the process of shielded metal arc welding (SMAW), also known as arc or stick welding, these parameters are always in a state of flux (Jeffus, 2012). The state of flux is created by the welding electrode being consumed during the welding process (Jeffus, 2012). This requires the welder to maintain the correct position, angles, and travel speed all while slowly feeding the electrode downward to maintain the correct arc length. The other aspect of welding that increases the need of manual dexterity is the use of weave patterns. The
manipulation of the electrode, weaving, can help control penetration, width, porosity, undercut, and slag inclusion (Jeffus, 2012; Jeffus & Bower, 2010b).

Understanding that welders need to be dexterous to weld correctly would make a researcher hypothesize that if a person has a high level of dexterity then the person would be able to weld and vice versa. Therefore, if a dexterity test that replicates the psychomotor skills necessary for welding were implemented in a training program, would it be able to accurately predict the future performance of the trainees?

**Theoretical Framework**

The theoretical framework that guided this study was Campbell, McCloy, Oppler, and Sager’s (1993) determinants of job performance components. To understand determinants of job performance, one must ask what performance is. Campbell et al. (1993) stated that “performance consists of goal-relevant actions that are under the control of the individual, regardless of whether they are cognitive, motor, psychomotor, or interpersonal” (p. 40). In an industry setting confusion between performance, effectiveness, and productivity is common (Campbell et al., 1993). Therefore, an individual must understand the differences between the terms in order to fully comprehend what performance truly represents. Performance of a job will produce a result, whereas effectiveness is the systematic evaluation of the results of a performance (Campbell, 1999, Campbell et al., 1993). Productivity refers to the financial side, which studies how much money and effectiveness is needed to achieve the next level of effectiveness (Campbell, 1999, Campbell et al., 1993).

A Performance component is comprised of determinants and antecedents (Campbell et al., 1993). Refer to Figure 1. Performance components are categories of actions people are expected to complete as part of a job (Campbell, 1999, Campbell et al., 1993). Performance determinants include declarative knowledge; procedural knowledge and skill; and motivation (Campbell, 1999, Campbell et al., 1993). Differences between people that perform the same job are expressed through performance determinants. The three performance determinants compose a performance component (Campbell, 1999, Campbell et al., 1993). Declarative knowledge refers to the knowledge about facts and principals related to the job that an individual possesses (Campbell, 1999, Campbell et al., 1993). Procedural knowledge and skill is the combination of knowing what to do, declarative knowledge, with the skill to do it (Campbell, 1999, Campbell et al., 1993). Skills that fall under procedural knowledge include cognitive, psychomotor, physical, self-management, and interpersonal (Campbell, 1999, Campbell et al., 1993). The last determinant is motivation, which refers to the effort a person puts towards a job (Campbell, 1999, Campbell et al., 1993). This involves an individual making the decision to expend effort, determine what level of effort to exert, and how long to exert effort when performing a job (Campbell, 1999, Campbell et al., 1993).

Antecedents of performance determinants are the predictors of performance (Campbell, 1999, Campbell et al., 1993). Performance indicators of declarative knowledge include ability, personality, interests, education, training, experience, and aptitude interactions (Campbell, 1999, Campbell et al., 1993). Procedural knowledge and skill performance predictors consist of ability, personality, interests, education, training, practice, and aptitude interactions (Campbell, 1999, Campbell et al., 1993). Motivational antecedents are comprised of variables related to the theory of motivation being utilized (Campbell, 1999, Campbell et al., 1993). For this study, the researchers will focus on the performance antecedents of procedural knowledge and skill. The specific antecedent that will be examined is psychomotor skill as it relates to welding performance.
Purpose and Objectives

The purpose of this study was to examine if dexterity could predict the future performance of a beginning welder entering a welding training program. In addition, the study sought to describe the change in dexterity during the welding training program. This study also intended to determine if a relationship exists between an individual’s dexterity and pass/fail rating from the visual inspection of the test weld. This research aligns with the American Association for Agricultural Education’s National Research Agenda Priority Area 3: Sufficient scientific and professional workforce that addresses the challenges of the 21st century (Doerfert, 2011, p. 9). Specifically relating to improve agricultural productivity efficiency and effectiveness to increase sustainable growth in the private setting (Doerfert, 2011). The following objectives were identified to address the purposes of this study.

1. Describe the dexterity of the participants in a welding training program.
2. Report the pass/fail rating of visual inspection of test welds performed by participants.
3. Determine if a relationship exists between participant dexterity and the pass/fail rating of visual inspection of test welds.

Methods

This study is part of a larger research study that examined the effectiveness of integrated virtual reality welding training programs utilizing the VRTEX® 360 and VRTEX® Mobile units. This study was conducted at the Iowa State University where a virtual reality and real-world welding training laboratory were utilized. The individuals who participated in this study did so voluntarily. There were incentives for participation that included having lunch provided each day and having the weld certification test fees paid for. There were three female and 20 male participants within this study. The background of the participants varied between college students, secondary educators, to industry workers. The welding training programs were offered in five variations. Two programs utilized only the VRTEX® Mobile unit in a 100 percent virtual reality training and 50/50 virtual/traditional integrated training program. The programs that utilized the VRTEX® Mobile unit were only one week long. Three programs were offered as either 50/50 virtual/traditional, 75/25 virtual/traditional, and 100 percent virtual training utilizing the VRTEX® 360. The programs that utilized the VRTEX® 360 were two weeks long. The variation of training programs are based on the programs used in the study conducted by Stone, McLaurin, Zhong, and Watts (2013). In the study conducted by Stone et al. (2013) the program groups utilized was 50/50 virtual/traditional and 100 percent virtual reality training. The 75/25 virtual/traditional group was added to determine if

To obtain dexterity data about the participants the researchers utilized the Complete Minnesota Dexterity Test (CMDT). The CMDT is used to measure a person’s rapid eye-hand coordination and arm-hand dexterity also known as gross motor skills (Lafayette Instrument, 2012). This test consists of five parts, but only three were utilized because they closely replicated the movements used during the welding process. The tests that were completed by the participants included: a) placing test; b) turning test; and c) displacement test. The CMDT utilizes two test boards, each containing 60 holes. Sixty corresponding disks are utilized during the tests that participants manipulated with their hands and arms. The participants were required to stand for the dexterity tests. The dexterity tests were completed by participants on the first day of the welding training
program and after the test welds were completed on test days. Depending on which training program the participants were in determined how many times the dexterity tests were completed. Participants in the one-week session completed dexterity tests twice. During the two-week long session, participants completed the dexterity tests three times.

In the placing test, the two boards are laid on a tabletop side by side about 1” from the edge of the table. The board farthest away will have the disks in it. When the examiner says start, the participant using their dominant hand will move the disks one by one from the top board to the bottom board. The participant’s non-dominant hand must not be used to brace the participant in anyway during the test. Once all the disks have been placed the time taken to complete the test was recorded.

The turning test used only one board and all 60 disks. Starting in the top right corner, the participant used one hand to pick up a single disk, turn it with the other hand, and then place it back in the board. The participant will replicate this for all discs on the top row of the board, then go to the next row below and go back across the board. They will follow this procedure until all of the disks have been turned, and the amount of time needed to complete the test was recorded.

The displacement test also used one board and all 60 disks. With all the disks inserted into the board, the participant will be instructed to remove the disk from the top left hand corner of the board and place it to the side. This test will require the participant to move the disk directly below the empty space up into it. Then following the same procedure until the participant has went all the way across the board. Time was recorded once the participant has completed the test.

For each test, the participants were given a practice run to fully understand how to perform the tests. Following the practice run, the participants completed the test three times. The time for the practice run and all three test runs were recorded. The three test times were then averaged. The average was used along with the interpretation chart developed by Ziegler, Jurgensen, Harmon, Roberts, and Bauman (American Guidance Service, 1969), included with the test to find the participants percentile rank. The percentile scale is used to interpret a subject’s score in terms of percent of the normative population, the scale ranged from zero to 100 (Lafayette Instrument, 2012).

After all the participants completed the welding training programs they were given the opportunity to complete test welds that were visually inspected by a certified welding inspector (CWI). The length of the training program dictated how many test welds were to be completed by the participants. The four possible test welds a participant could perform were 2F (horizontal fillet weld), 1G (flat groove weld), 3F (vertical fillet weld), and 3G (vertical groove weld). The participants performed the welds utilizing shielded metal arc welding (SMAW) and gas metal arc welding (GMAW) processes. The participants in the one-week session completed the 2F and 1G welds for both welding processes. Whereas the two-week session participants completed all four weld types in both welding processes. The CWI examined the test weldment and measured for the following discontinuities underfill, overfill, undercut, porosity, lack of fusion, and cracks according to AWS D1.1 structural welding code. The data from the visual inspection was recorded as pass or fail.
The data were analyzed using Microsoft Excel 2010 and Predictive Analytics SoftWare (PASW) Statistics 18 software package. Descriptive statistics were calculated to identify frequencies for pass/fail rates and dexterity percentile rankings. A bivariate correlation was calculated to examine the relationship between recorded times and visual pass/fail rates. With a numerical variable and a dichotomous variable utilizing the bivariate correlation calculation was needed to evaluate the relationship between the variables (Gravetter & Wallnau, 2009). Researchers utilized the r squared (r2) statistic to examine the effect size of the bivariate correlation. To evaluate the effect size of a bivariate correlation Gravetter and Wallnau (2009) indicated that r2 should be used.

Results

The performance measures used in this study included the time it took to complete the dexterity tests and the visual inspection of participants test welds. Objective one sought to describe the average dexterity of the participants of this study. Table 1 shows the average dexterity in quartiles of the population norm. For example, if you put the entire population on a scale of zero to 100, the quartiles would be 25 (low), 50 (medium), 75 (high), and 100 (very high). Dexterous ability was lowest at zero and is highest at 100. This means that the participants in the 25 percent quartile represent those with the least dexterous ability. The individuals in the 100 percent quartile represent those with the most dexterous ability within the population.

Table 1
Average Overall Dexterity of Participants in Quartiles by Type of Dexterity Test

<table>
<thead>
<tr>
<th>Type of Test</th>
<th>25%</th>
<th>50%</th>
<th>75%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f (%)</td>
<td>f (%)</td>
<td>f (%)</td>
<td>f (%)</td>
</tr>
<tr>
<td>1st Day of Traininga Placing</td>
<td>18(78.3)</td>
<td>3(13.0)</td>
<td>2(8.7)</td>
<td>0(0.0)</td>
</tr>
<tr>
<td>Turning</td>
<td>18(78.3)</td>
<td>3(13.0)</td>
<td>1(4.3)</td>
<td>1(4.3)</td>
</tr>
<tr>
<td>Displacement</td>
<td>9(39.1)</td>
<td>5(21.7)</td>
<td>1(4.3)</td>
<td>8(34.8)</td>
</tr>
<tr>
<td>Week 1 Test Daya Placing</td>
<td>11(47.8)</td>
<td>4(17.4)</td>
<td>3(13.0)</td>
<td>5(21.7)</td>
</tr>
<tr>
<td>Turning</td>
<td>13(56.5)</td>
<td>2(8.7)</td>
<td>0(0.0)</td>
<td>8(34.8)</td>
</tr>
<tr>
<td>Displacement</td>
<td>9(39.1)</td>
<td>1(4.3)</td>
<td>2(8.7)</td>
<td>11(47.8)</td>
</tr>
<tr>
<td>Week 2 Test Dayb Placing</td>
<td>7(46.7)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>8(53.3)</td>
</tr>
<tr>
<td>Turning</td>
<td>6(40.0)</td>
<td>0(0.0)</td>
<td>2(13.3)</td>
<td>7(46.7)</td>
</tr>
<tr>
<td>Displacement</td>
<td>3(20.0)</td>
<td>2(13.3)</td>
<td>0(0.0)</td>
<td>10(66.7)</td>
</tr>
</tbody>
</table>

Note. a n = 23, b n = 15.

When examining participant dexterity on the first day of training, it can be identified that with the placing and turning tests 78.3 percent of the participants had low dexterous ability. However, 34.8 percent of participants exuded a very high level of dexterity on the displacement test the first day of training. An increase in dexterous ability can be seen from the first day of training to the test day of week one. This is evident with the placing test where the first day of training shown none of the participants were identified as having very high dexterity, but after the week
one test day 21.7 percent (n = 5) of the participants had a very high dexterous ability. This increase in dexterous ability was also evident in the turning and displacement tests. The increase of dexterous ability continued on the week two test day. The number of participants exuding a very high level of dexterity grew by 11.9 – 31.6 percent.

To further examine this increase in dexterous ability, the data were separated by the type of training program. The participants in the 50/50 virtual/traditional training program, had no change in dexterous ability from the first day of training to the week one test day. However, in the 100 percent virtual training program a growth in dexterous ability can be seen in all three types of tests. Although, the displacement test shown 25 percent of participants dropped in their dexterous ability in the one-week training program.

Participant dexterity for the two-week training programs has been separated. In the 50/50 virtual and traditional training method, an overall increase in dexterous ability can be seen across all three types of tests completed. The one exception was on week two-test day where 13.7 percent of participants fell from the 50 percent group to the 25 percent group. The drop indicates a loss of dexterous ability. The 75/25 virtual/traditional training group shown an increase in overall dexterous ability for all types of tests completed on test days for both weeks. The most striking change is in the turning test, where 80 percent of the participants had an increase in dexterity. Within the 100 percent virtual training group, participants also had an overall increase in dexterity. The placing and turning tests had the highest increase in ability where 75 percent of participants had a positive shift in ability.

Objective two examined the visual inspection, based on AWS D1.1 standards, of participants’ test welds. The rating of the visual inspection was either a pass or fail, determined by a CWI. It can be determined that the participants fared better with the groove welds than the fillet welds in both weld processes. This is shown in the overall pass/fail rates as the groove welds are the only weld type that has a majority of participants passing visual inspection in both weld processes. The weld type that had the highest number visual inspections that passed was the 1G in each weld processes. The most difficult weld for the participants of this study was the 3F in both weld processes.

If we examine the pass/fail rate by training program type several patterns can be identified. In the 50/50 virtual/traditional one-week program, the majority of the participants failed visual inspection in all weld types except the 1G in the GMAW welding process. Within the 100 percent virtual one-week training program a majority of participants passed visual inspection, expect in the GMAW 2F weld. When examining the two-week training programs, the 50/50 virtual to traditional group failed 60 percent (n = 29) of test weld visual inspections. However, the 75/25 virtual/traditional group passed 62.5 percent (n = 25) of visual inspections. The 100 percent virtual group failed 59 percent (n = 19) of the test weld visual inspections.

The third objective of this study sought to examine the relationship between participant dexterity and the participants corresponding visual inspection pass/fail rates. To examine the relationship a bivariate Pearson’s correlation was calculated. The results can be seen in Table 2. All three dexterity tests given were found to be significant with the visual pass/fail rates of the participants for the 2F and 1G weld types in the SMAW welding process. The placing test was found to be significant with the 2F weld type on the first day of training. However, all three dexterity tests
were found significant with the 2F weld type on test day of week one. The turning test was significant with the 2F weld type on test day of week two. The 1G weld type found significance on both test days with the turning test only.

Table 2
Bivariate Correlations between Participant Dexterity and Visual Inspection Pass/Fail Rate

<table>
<thead>
<tr>
<th>Type of Test</th>
<th>SMAW</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>GMAW</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2F r(p)</td>
<td>1G r(p)</td>
<td>3F r(p)</td>
<td>3G r(p)</td>
<td>2F r(p)</td>
<td>1G r(p)</td>
<td>3F r(p)</td>
<td>3G r(p)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Day of Training Placing</td>
<td>.417* (.048)</td>
<td>.257 (.237)</td>
<td>.504 (.055)</td>
<td>.358 (.190)</td>
<td>.203 (.353)</td>
<td>-.077 (.726)</td>
<td>.110 (.695)</td>
<td>-.087 (.758)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turning</td>
<td>.117 (.596)</td>
<td>.351 (.100)</td>
<td>.344 (.209)</td>
<td>.355 (.209)</td>
<td>.084 (.705)</td>
<td>-.202 (.355)</td>
<td>.359 (.188)</td>
<td>.355 (.194)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Displacement</td>
<td>.206 (.345)</td>
<td>.244 (.262)</td>
<td>.354 (.196)</td>
<td>.111 (.695)</td>
<td>.383 (.072)</td>
<td>-.151 (.491)</td>
<td>.069 (.807)</td>
<td>.095 (.736)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 1 Test Day Placing</td>
<td>.590** (.003)</td>
<td>.351 (.101)</td>
<td>.424 (.115)</td>
<td>.229 (.411)</td>
<td>-.118 (.593)</td>
<td>.140 (.523)</td>
<td>.052 (.609)</td>
<td>.115 (.684)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turning</td>
<td>.614* (.002)</td>
<td>.546** (.007)</td>
<td>.181 (.518)</td>
<td>.113 (.688)</td>
<td>-.132 (.548)</td>
<td>.019 (.933)</td>
<td>-.185 (.509)</td>
<td>.184 (.512)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Displacement</td>
<td>.619* (.002)</td>
<td>.406 (.055)</td>
<td>.272 (.326)</td>
<td>.298 (.280)</td>
<td>.200 (.359)</td>
<td>.067 (.760)</td>
<td>.152 (.588)</td>
<td>.231 (.407)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 2 Test Day Placing</td>
<td>.428 (.111)</td>
<td>.066 (.815)</td>
<td>.328 (.232)</td>
<td>.204 (.467)</td>
<td>-.018 (.950)</td>
<td>.338 (.218)</td>
<td>-.019 (.946)</td>
<td>-.018 (.950)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turning</td>
<td>.642** (.010)</td>
<td>.560* (.030)</td>
<td>-.085 (.764)</td>
<td>.312 (.257)</td>
<td>-.179 (.524)</td>
<td>.454 (.089)</td>
<td>-.092 (.745)</td>
<td>.183 (.513)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Displacement</td>
<td>.450 (.092)</td>
<td>.140 (.620)</td>
<td>.109 (.699)</td>
<td>.430 (.110)</td>
<td>-.228 (.413)</td>
<td>.486 (.066)</td>
<td>.100 (.724)</td>
<td>.107 (.703)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *p = 0.05, **p = 0.01.

To interpret the magnitude of the relationship between two variables, Gravetter and Wallnau (2009) indicated that r2 should be used. The results of the r2 calculations can be seen in Table 4.6. Gravetter and Wallnau (2009) suggested the following scale when interpreting the r2 statistic: 0.01 = small effect; 0.09 = medium effect; 0.25 = large effect. Following the suggestions of Gravetter and Wallnau (2009), all the dexterity tests exhibited a very large effect on the pass/fail rates of the participants test welds. The turning test exhibited the largest effect in the study on test day of week two. The placing test on the first day of training exhibited a large effect on the pass/fail rate, yet was the lowest out of the tests that revealed a significant relationship.
Table 3  
*Effect Size of Dexterity Tests and Visual Pass/Fail Rates*

<table>
<thead>
<tr>
<th>Dexterity Test</th>
<th>N</th>
<th>$r$</th>
<th>$p$</th>
<th>$r^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2F-SMAW</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Placing Test (0)</td>
<td>23</td>
<td>.417</td>
<td>.048*</td>
<td>.173</td>
</tr>
<tr>
<td>Placing Test (1)</td>
<td>23</td>
<td>.590</td>
<td>.003**</td>
<td>.348</td>
</tr>
<tr>
<td>Turning Test (1)</td>
<td>23</td>
<td>.614</td>
<td>.002**</td>
<td>.377</td>
</tr>
<tr>
<td>Displacement Test (1)</td>
<td>23</td>
<td>.619</td>
<td>.002**</td>
<td>.383</td>
</tr>
<tr>
<td>Turning Test (2)</td>
<td>15</td>
<td>.642</td>
<td>.010**</td>
<td>.412</td>
</tr>
<tr>
<td>1G-SMAW</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turning Test (1)</td>
<td>23</td>
<td>.546</td>
<td>.007**</td>
<td>.298</td>
</tr>
<tr>
<td>Turning Test (2)</td>
<td>15</td>
<td>.560</td>
<td>.030*</td>
<td>.313</td>
</tr>
</tbody>
</table>

*Note.*  
* $p = 0.05$, ** $p = 0.01$.

**Conclusions and Discussion**

From the results of this study several conclusions can be drawn. First, one trend that was identified was dexterous ability for a majority of the participants increased during the training program. Conversely, there were several participants that either exhibited no change in dexterous ability or they lost dexterity during the training program. The change in ability supports the notion that it takes time to master the craft of welding (Giachino & Weeks, 1985). Because of the increase in dexterous ability over the first week of training raises the question would it be better to test for dexterity after the first week of training? Do participants need a sufficient amount of time to become acclimated to the new skills they are learning before being tested or should a person’s innate ability before learning new skills be the basis of selection?

It can also be concluded that with more time in a virtual reality environment the larger the increase of dexterous ability. This is evident in all but the 50/50 virtual/traditional training methods. This suggests that the virtual reality gives participants the capability to hone task related abilities, which supports the conclusions of previous research using simulations in the medical, dental, and welding fields for training purposes (Boulet et al., 2003; Kunkler, 2006; Papadopoulos et al., 2013; Stone et al., 2011). With the VRTEx® systems users are able to get instant feedback through numerical grades and graphical representations of the welding parameters. The use of cheater lenses that help guide the user to the correct angles, speed, position, and arc length can also be used. With traditional training methods, it is a trial and error type of learning environment where there is no instant feedback given when you weld. The feedback in a traditional training program comes after showing an instructor. From the results, it can be concluded that dexterity can increase with the use of both instant and accurate feedback.

When examining the pass/fail rates from the visual inspections, it can be concluded that participants were better at performing the less complex welds. It can also be concluded that the 100 percent virtual training programs performed the 1G weld better than the other training programs. The 75/25 virtual/traditional training methods outperformed the other training method types. This suggests that the 75/25 virtual/traditional training method may best suited at preparing beginning welders. As virtual reality given the ability to replicate welds faster than
traditional methods leads to the notion that practicing in a virtual environment leads to quicker development of psychomotor skills in participants.

Objective three sought to explore the relationship between participant dexterity and the pass/fail rating of the visual inspection in order to examine the predictability of dexterity on future performance. This reinforces Campbell et al. (1993) determinants of job performance component procedural knowledge and skill because dexterity can affect overall task performance. It can be concluded that dexterity can predict future performance of beginning welders completing basic SMAW welds. The ability of dexterity to predict future performance supports the finding in other occupational fields (Gansky et al., 2004; Gettman et al., 2003; Hitchings & Moore, 1991; Levine et al., 1996; Mansell, 1969). All of the tests utilized shown a significant relationship with a beginning welder’s ability to visually pass/fail inspection by a CWI. This implies industry personnel can use dexterity to select people to enter welding training programs that use basic SMAW welds.

**Recommendations**

Conclusions from this study lead to several recommendations. First, it is recommended that welding training programs utilize virtual reality simulations to aid in the training process. With the use of virtual reality, welding training programs can become more efficient, in terms of passing visual inspections, which is imperative to meet today’s demand for certified welders. With the increased need for certified welders, it is a necessity to create efficient training programs.

With the ability to use dexterity to predict future performance with simple welds, it is recommended that training programs that teach simple welds use dexterity testing to select individuals to enter the training program. With the requisite of having high dexterity may lead to better candidate selection for the welding training programs. With the influx of individuals drawn to welding by virtual reality simulators, welding training programs will be able to objectively select the best individuals for training.

The researchers also recommend that future studies be conducted to further examine the use of dexterity to predict future performance by utilizing different dexterity tests. Further investigation is needed to examine if dexterity can predict future performance for more complex welds. It is suggested to use dexterity tests that evaluate fine, finger and hand, and gross, hand and arm, dexterity. It is also recommended that future studies look into the possibility of creating a dexterity test that more resembles the movements of a welder to improve the ability of dexterity to predict future performance. Further investigation is needed to determine if dexterity can predict future performance of GMAW type welds. Is GMAW easier to perform than SMAW type welds and is that why dexterity is not an indicator?

**References**


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Agricultural Mechanic Psychomotor Skill Development for Pre-Service Teachers: An Action Research Approach

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Michael J. Martin, Colorado State University

Abstract

Agricultural mechanics instruction has long been considered an essential component of a complete and well-rounded agricultural education program. Mechanics laboratories are among the most prevalent facilities for offering learning experiences. However, the process of teaching and learning agricultural mechanics has not been thoroughly covered in research. This action research study seeks to find effective ways to develop pre-service teacher’s skills in agricultural mechanics as well as model effective means of teaching skill development. We utilized an eight week course on tool skill development for this project. Student and instructor reflections guided two rounds of classroom modifications following an action research model. The significant changes to the class included flipping classroom instruction on the tool safety instruction and demonstration by utilizing online videos. This modification also provided time for a more structured assessment of their practice. We developed a curriculum model based on this action research project: agricultural mechanics skills development model. The agricultural mechanics skill development model focuses on student learning through focused skill development while increasing the time spent on each student and decreasing the time spent on procedures and rules.

Introduction

Agricultural mechanics instruction has long been considered an essential component of a complete and well-rounded agricultural education program, and school-based agriculture enrollments continue to be strong (Burris, Robinson, & Terry, 2005). The mechanics/carpentry/welding facilities in school-based agricultural education programs are among the most prevalent facilities provided for offering learning experiences (Shoulders, Blythe, & Myers, 2013). This emphasis on agricultural mechanics instruction has surfaced in recent literature with a focus on safety and laboratory management technical competency development (McKim & Saucier, 2011; McKim & Saucier, 2012), the development of constructs for management of the agricultural mechanics laboratories (McKim & Saucier, 2013), and the subsequent gain in student confidence with mastery of technical skills (Saucier & McKim, 2011; Leiby, Robinson, & Key, 2013). However, the process of teaching and learning agricultural mechanics has not thoroughly been covered in pedagogical research.

The goal of a teacher education program in agricultural education currently and historically is to effectively develop teacher attributes which will allow for successful implementation of the agriculture curricula (Shoulders, Blythe, & Myers, 2013; Roberts & Dyer, 2004; Mundt & Conners, 1999). Pre-service teachers must attain significant skill development, including in agricultural mechanics in order to successfully reflect the needs of school-based programs (Burris, Robinson, & Terry, 2005). Pre-service agriculture teachers must learn the skills associated with agricultural mechanics as well as how to teach agricultural mechanics. Teacher preparation programs should focus on providing a high level of technical skill training in
agricultural mechanics and strive to increase agricultural education students’ confidence to teach it effectively (Leiby, Robinson, & Key, 2013).

While the need to provide educational experiences in agricultural mechanics is great, the challenge exists to prepare teachers both specifically within an agriculture pathway (like agricultural mechanics) while also providing a breadth of experiences for the development of a complete agricultural education program. Pre-service teacher education programs are tasked with training teachers in the professional knowledge, technical knowledge and general knowledge competencies necessary to be a school-based teacher of agricultural education (Stripling & Barrick, 2013). To fulfill all of these tasks within a four year timeline continued research on how to best deliver agricultural education curriculum in an efficient manner is necessary. The American Association for Agricultural Education (AAAE) National Research Agenda (Doerfert, 2011) discussed the need for meaningful and engaged learning environments as Priority 5. A great interface for teacher education is the ability to create “efficient and effective” Agricultural Education Programs (Doerfert, 2011, p. 10). Thus, there is a need to pursue research to guide teacher education programs in skill development courses with a pedagogical content to fit within the constraint of time and credits for completing a degree program. This action research study seeks to find effective ways to develop pre-service teacher’s skills as well as model effective means of teaching skill development in agricultural mechanics as both time and credit hours for teaching this content are limited.

**Conceptual Framework**

Psychomotor skill development is an important aspect in many agriculture pathways (Phipps, Osborne, Dyer, & Ball, 2008). The development of skills is often seen as a critical component of technical agriculture training as it leads to skills necessary in agriculture careers (Roberts & Ball, 2009). Psychomotor skills allow for concrete experiences (Shoulders & Myers, 2013), one of the four stages of Kolb’s (1984) experiential learning model. While Kolb (1984) contends that students can enter into the model in any of the four stages, concrete experience, abstract conceptualization, active experimentation, or reflective observation (Kolb, 1984), in this agricultural mechanics instruction, we contend that it is necessary to enter into specific and discreet concrete experiences in skill development before advancing to higher order experiential learning such as reflective conceptualization or active experimentation.

For example when providing experiences for student development in the laboratory, there is an overwhelming notion that the instructor must provide a project experience for students. This project offers a concrete experience for students, but less often offers experiences which can be considered reflective observations or active experimentation, noted levels of higher learning in Kolb’s (1984) experiential learning framework. As a result the practice of the skills during the construction of a project experience do not allow for the transformation of knowledge beyond skill development (Shoulders & Myers, 2013). Because sufficient time is not spent providing a baseline development of skills prior to the implementation of a project, often times the experience of building the project is lost due to students’ attention being spent on practicing the skill of tool operation and not on the application. When developed psychomotor skills are applied to a project construction experience after development, these experiences are more meaningful in nature and allow for the transferability of skills beyond the concrete experience.
but to the application of skills in situations allowing opportunities for reflective observations or active experimentation. (Stripling & Barrick, 2013).

These concrete experiences should be directed and guided by the three stages of the psychomotor skill development model as presented by Phipps, et al. (2008) shown in Figure 1.

![Figure 1. Stages of Psychomotor Skill Development (Phipps et al., 2008, p. 309)](image)

The stages of psychomotor skill development guided the conceptual framework in this action research project (Phipps, et al., 2008). Psychomotor skill development is a three-stage process which frames how pre-service teachers can develop more effective and efficient methods of delivering skilled instruction. Stage one is early cognitive development involving observation and attention. Stage two is practice as the student performs initial practice under guidance. Stage three is identified as autonomy because the skill is practiced, becomes automatic, and the student’s speed and dexterity is increased.

**Purpose and Objectives**

The purpose of this study was to develop instructional methods for effective agricultural mechanics instruction in the class and laboratory through action research in an undergraduate agriculture mechanics course taught at Colorado State University. The study also sought to determine effective and efficient means of assessing skill development in agriculture mechanics by addressing the following question:

1. What instructional methods will effectively and efficiently move students along the stages of psychomotor skill development (Phipps et al., 2008) in agriculture mechanics?

**Methods/Procedures**

Action research was chosen as the method for this study because action research seeks to discover teaching practices which are efficient and effective. According to Hendricks (2013)
“The purpose of action research is for practitioners to investigate and improve their practices” (p. 3). This classroom action research format allowed me, the lead researcher and instructor, to collect data from students and gain immediate feedback on teaching methods which work best for this cohort. I also worked with my faculty team in analyzing the data and designing curricula changes. The involvement of my students in this process was critical to the success of this approach. The idea behind action research is that changes made based on the input of students will lead to more effective instruction (Stringer, 1999). More importantly, with the students directly involved in the research process from start to finish, the implementation of these different methods allowed the students to benefit directly from the research study.

The participants in this action research study were students enrolled in an agriculture mechanics class. The curriculum focused on the development of skills through the use of power tools. The class had 15 students and met for two hours once a week for eight weeks during the semester. The students enrolled in the course were all Agricultural Education majors with the intention of becoming school-based agricultural educators. The demographic make-up of the class was very diverse, as ten of the students were female and five students were male. Seven of the students were going to student teach within a year of taking the course. Nine of the students had taken agriculture courses in high school whereas six had no access to agriculture courses while in high school. Eight of the students were of senior status, two junior, three sophomore, and two were post bachelor students seeking teacher licensure. The course was taught in a classroom and laboratory setting with a classroom component which focused on safety and operation of power tools as well as a laboratory component in which students practiced in each skill. Each week I added two new tools to examine and use in the class and laboratory.

The action research plan was designed to modify laboratory instruction every two weeks based on feedback from student responses to reflective questions and from my reflective journals. This method was based on Norton’s (2009) five-step process for carrying out action research and was implemented by our research team as follows:

1. We identified the need to increase pre-service teacher skills and confidence in agricultural mechanics.
2. We offered a course in agricultural mechanics skill development to address this need.
3. We collected written responses to open-ended reflection questions from the students enrolled in the course. Additionally, I kept a reflective journal on my observations of the class.
4. We evaluated the student reflective question responses and the instructor journals to determine what instructional methods worked and to identify the frustrations of students.
5. Based on this information gathered during the semester, I modified instruction and assessment of students on a biweekly basis.

I modified my methods of instruction every two weeks based on students responses and my instructor reflections; hence, steps 3-5 were repeated every two weeks for the duration of the eight-week course. The following list outlines the instructional plan and modifications which were made during the course:
Weeks 1-2 - Students read safety rules and reviewed tool diagrams outside of class time. During class, students were required to pass tool safety tests, watch a demonstration on operation and basic maintenance of each tool demonstrated by me, and then go to the mechanics laboratory to practice operation of each tool.

Weeks 3-4 - Modifications included flipping the classroom so students could watch the tool demonstration on YouTube outside of class time. Furthermore, I implemented a skill card assessment for students to provide them a form of feedback on their performance. All other instructional procedures were the same as in weeks 1-2.

Weeks 5-6 - Modifications included utilizing an assessment job operation sheet (JOS) for practice. Students followed the JOS and were graded by me on each JOS step. All other instructional procedures were the same as in weeks 3-4.

Weeks 7-8 - Students reviewed safety and tool operations to prepare for the exam, reviewed how to write a JOS, practiced with tools, and prepared for written and practicum exam.

At the conclusion of the course, a final evaluation of all results was conducted.

Data was collected throughout the study using several different methods. I kept a weekly journal describing my perceptions on how the class was progressing. This information included the time it took to complete different teaching methods, how I was assessing student growth, and what I felt was effective and not effective instructional strategies. I also indicated frustrations I would have while teaching the course. Students were asked to fill out responses to open-ended reflection questions during the course, which were referred to as mid-term reflection surveys. These reflections were administered every two weeks during the course. The students were asked to assess the quality of the instruction and what their confidence level was for each tool covered during the two week interval. Students were also asked what instructional strategies helped them the most/least, what frustrated them the most during instruction, if the time spent on instruction inside and outside of class was reasonable, if the assessment was reasonable, and what could have been done to make the content more relevant. Data was also collected from the written and practicum exams and from a confidence survey taken by the students at the start and then at the end of the course. Exams were scored based on a traditional assessment as well as a rubric scored practicum which included both written and performance assessments.

Analysis of the data was an ongoing process for the duration of the class. At the conclusion of each two-week interval the mid-term reflections and instructor reflections were analyzed and coded by the instructor to determine the emerging themes. Once the themes were coded the faculty team, which includes the instructor, met and discussed how to adapt instruction to improve student learning. Based on these discussions, changes to the instructional process were implemented. From the first round of coding, the emerging theme was frustration from the students and the instructor concerning the amount of time it took to complete the tool demonstrations. As a result, instruction was modified to flip the classroom so tool demonstrations were posted online for students to watch prior to coming to class. The second round of reflection responses were analyzed with the same approach as that used in the first round. The common theme from this round of coding was confusion and frustration with assessment and providing feedback to students during skill development. Based on this data, we decided to implement the use of an assessment job operation sheet (JOS). The third round of reflections were analyzed and coded to determine the effectiveness of all instruction.
modifications made during the course. No other instructional changes were implemented as the course was nearing completion and any changes implemented would not have had sufficient time to be analyzed. The exam scores were analyzed and coded to show distribution of student proficiency on the content from the class. The quantitative data in regards to student confidence and exam performance was reviewed but was not analyzed or used in detail as part of this action research study.

We were conscious of the need to carry out this research rigorously. Stinger (1999) laid out some steps for maintaining trustworthiness, which we followed in this study. We developed credibility through prolonged engagement with the students. The data were coded and analyzed by the lead instructor; however, credibility was further developed through our faculty team discussions after each round and plan for instructional modification. We fostered transferability of the study to other agricultural mechanics courses by providing detailed descriptions of the course and modifications. Finally, we ensured dependability of the data by maintaining an audit trail which included the raw data and details of how we analyzed and made modifications to the course.

**Results and Findings**

The original instructional methods used in this class were traditional in nature. The students were expected to have read a set of safety rules for the tools being covered for that class. I would review the rules and perform a demonstration in class showing operation and basic maintenance of the tool. Students would then take a safety test over each tool and had to obtain a passing score of 100%. When this score was obtained students then proceeded to the mechanics laboratory to practice using the tool. After practicing with the tool the student would ask me to evaluate them. I would then fill out the specific tool skill card. Part of a skill card is shown in Figure 2.

![Skill Card for Stationary Power Tools – Miter Saw](image)

*Figure 2. Part of a Skill Card for Miter Saws*
The skill card was to be used as the matrix to assess the student on each particular tool. After the first two weeks of instruction using this format, the students were asked to respond to a set of reflection questions related to their impressions of the class. I also kept a weekly reflective journal of my impressions of what was happening in the class. Every two weeks the student responses and my journals were analyzed and instructional modifications were made to the class based on problem area themes.

**Student Theme 1: Lack of Practice Time**

Many of the students expressed a desire to have more time to practice tool usage. Some students indicated they had enough prior knowledge of certain tools; hence, they did not see the need in having to sit through a whole in class demonstration before taking the safety assessments and moving on to practice. More importantly, many students were frustrated because they did not feel they had enough time to actually use the tools in different application situations. When asked what strategies helped their learning process the most for a specific tool, the overwhelming response was “actually using the tool.” Many students commented that using and practicing with the tool was the most helpful for them. When asked what could have been done to make the learning process more effective, the overwhelming response was “need more time to practice.” This request for more practice time not only included using the tool, but also time to perform basic maintenance and adjustment applications. Students indicated that demonstrations from the instructor were important and helpful, but they were frustrated with the amount of practice time they lost due to the required demonstration of the operation and maintenance of each tool.

**Instructor Theme 1: Length of Demonstration Time**

The instructor expressed frustration with the amount of time he was using during the class to effectively demonstrate the operation and maintenance of each tool. This was evident in comments from week two of his reflections: “I started demos on the two tools. WOW, that takes a long time and the students are not very engaged. We ran out of time to practice.” The frustration about time to practice and the amount of time needed to effectively demonstrate each tool was a reoccurring theme throughout the first two weeks of the instructor journals. The instructor indicates he realized that in order to allow students to practice he must take time out of the laboratory section for skill practice, which limited the class time for student participation in application projects. This worked against the original intention to provide more hands on experiences and less lecture-based demonstrations. This frustration with amount of time needed for demonstrations and lack of time for practice is evident in all of the instructor journal entries from the first two weeks.

**Modification to Address Theme 1**

The overly long demonstration theme in the first round of analysis was consistent in both the students’ responses and my own. This theme guided us, the faculty team, to investigate using the instructional modification of flipping the classroom for tool demonstrations. Flipping or inverting a classroom is a method of instruction in which content traditionally delivered in the classroom is provided for students outside the classroom setting. Typically, this content is delivered to students via a multimedia outlet or device (Lage, Platt, & Treglia, 2000; Stryer, 2012). As a result of this modification, tool demonstrations were recorded and posted on YouTube. Thus, prior to coming to class, students were required to read the safety information and watch the tool demonstrations online. When students arrived in class they would ask any questions that arose from the video and then take the safety test. Once the test was completed
and passed, students would move directly to the mechanics laboratory to practice, thus allowing more time for guided practice.

Analysis of the second round of mid-term student reflections and instructor reflections revealed that the implementation of the flipped classroom had a positive effective on alleviating many of the student and my frustrations in relation to the lack of practice time due to overly long demonstrations. However, the analysis of this round of student and instructor reflections indicated a new frustration theme from both the students and me. This frustration was related to feedback and assessment of students during skill practice. Originally, assessment of student growth was to be documented on a skill card which was developed and validated by teachers and industry in our state. This card was used to show student growth as they moved along the Phipps et al. (2008) stages of psychomotor development. Implementing the skill card into the instructional strategy was a source of frustration for both the students and me. As a result, the student responses and instructor journal reflections indicated a common frustration about the amount of guidance/feedback given while practicing the skills and how the assessment was measuring student skill development.

**Student Theme 2: Assessment and Feedback**
Theme 2 generated frustration around tool assessment and feedback starting with students’ frustration of having to wait to be assessed for each tool. Each student had to spend between five to fifteen minutes for each tool in order to be assessed by me using the skill cards. This frustration with the time needed for assessment and feedback was very evident through several student responses. One student wrote: “I would have found a way to reduce wait time” and another stated “[There was] too much time spent waiting”. Comments like these were evident from several of the students.

Additionally, the students continued to be confused and frustrated at how the skill cards were actually evaluating them. The card was not designed to generate a score or grade. Students expressed confusion and frustration over not knowing progress which is evident through this student response “I am really unsure about the skill cards (for all tools) and am nervous about getting those filled out.” Another student responded “[I need] more feedback,” These responses as well as other similar responses indicate that even though they performed a task and the skill card was filled in, they did not know their level of achievement or what else they needed to work on. The only tangible evidence they had was the product from practicing with the tool. However, this product was not used for anything or evaluated; thus, the students did not have any feedback on the product. This frustration theme showed that students wanted a more structured practice environment with a better assessment model so they could determine their level of achievement during practice.

**Instructor Theme 2: Management and Providing Assessment**
Analysis of the instructor reflections revealed a frustration with trying to manage the laboratory during practice as multiple students needed specific guidance all at once. The journals indicated that some students requested assistance, while some students needed a reminder on what to do next, and other students needed a skill card filled out. All of these student interactions were happening at the same time. During the analysis of his journals, the instructor realized that his frustration stemmed with not being able to adequately assess the growth of the students through the use of the skill card. The instructor could not indicate the level to which the students
mastered the skill by only using a skill card. Additionally, he was frustrated with the amount of time spent trying to help students with basic questions while also trying to assess and provide meaningful feedback to other students.

**Modification to Address Theme 2**
The theme in the second round of analysis indicated a frustration with the lack of opportunity for structured feedback. This theme is evident in both the reflection results from students and in my reflections. In order to address the frustrations expressed during this round of analysis, the faculty team decided to modify how the skill card was used. The skill card was no longer used as the assessment during practice. It was used as an overarching checklist of mastery during use of the tool in multiple applications over a long period of time.

This modified form of the skill card became a new form of assessment, which we called a Job Operation Sheets (JOS). This new form of assessment was a management, teaching and assessment tool. The JOS is a set of instructions detailing a step-by-step procedure for operation and practice of each tool. Part of a JOS is provided below in figure 3.

<table>
<thead>
<tr>
<th>Step</th>
<th>Procedures</th>
<th>Safety and Key Points</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Once you have your safety glasses and gear on, get a saw and stock from the storage areas.</td>
<td>You must have safety glasses and approved clothing on at all times! Be sure you know where to get the practice stock.</td>
<td>5 pts</td>
</tr>
<tr>
<td>2.</td>
<td>Mark your board so you cut a piece 1 3/8 wide. Measure from the end of your board and mark at 1 3/8. Make a second mark on the board the width of your kerf.</td>
<td>Be sure to use a square when marking your board so your line is perfectly straight. Remember the kerf of a circular saw is 1/8&quot;.</td>
<td>5 pts</td>
</tr>
<tr>
<td>3.</td>
<td>Place board on cutting table Hold the board securely against the fence and table.</td>
<td>If the board is large you may need to use the clamp or adjust the extendable table arms on the saw cart.</td>
<td>5 pts</td>
</tr>
<tr>
<td>4.</td>
<td>Inspect saw and make proper adjustments before use. Check to make sure the retracting guard is working properly. Be sure the cord show no signs of wear. Check to make sure the saw is set at the proper angle.</td>
<td>Use a square to make sure the saw is at the proper angle so you get a square cut. Remember is using the slide to pull the slide out so that you pull out plunge down and then slide back.</td>
<td>10 pts</td>
</tr>
</tbody>
</table>

*Figure 3. Part of a Job Operation Sheet for Miter Saws*

Each step of the JOS was evaluated against a rubric so the instructor could assess student performance of the skill and evaluate them based on his or her level of achievement at each step of the procedure. The use of the JOS allowed the instructor to watch multiple students practicing at one time and then assess their actions, while providing direct feedback to the students with a numerical score indicating their level of achievement. Additionally, each student knew exactly what steps he or she had to accomplish for each tool, thus allowing me to focus on assessing the steps and spend less telling students what to do next.
Analysis of the third round of mid-term reflections from both the students and the instructor revealed positive responses in regard to incorporating the use of the Job Operation Sheet. Student responses as well as instructor journals revealed both a reduction in frustration levels in regards to assessment as well as management, respectively. The final round of reflection responses from the students indicated a positive reception to both modifications implemented during the study. In fact when asked “What teaching strategies helped your learning process the most in preparing to operate this tool?” multiple students responded “[The] video demos and JOS.” The instructor reflections also indicate a favorable response and reduction in frustration level after implementing the JOS. The instructor indicated that the management of the laboratory is more structured and feedback to students is more direct and applicable to each individual student’s needs. The reduction in frustration levels from both the students and the instructor served as a positive indication that this modification in instruction is a positive method.

**Agricultural Mechanics Psychomotor Skill Development Model**

This action research project led us, the faculty research team, to develop an instructional model for developing agricultural mechanic skills. The agricultural mechanics psychomotor skill development model focuses on student learning through focused skill development while increasing the time spent on each student and decreasing the time spent on procedures and rules. This curriculum model emerged from the action research study. The model has responsibilities for students and teachers. The student model expectations follow:

**Students:**

1. Prior to class:
   a. Read safety rules of tools being covered in class (usually 2-3 tools).
   b. Watch a video demonstration on operation and maintenance of each tool.

2. In classroom:
   a. Ask clarification questions from videos.
   b. Take a safety test over each tool.
   c. Grade and obtain a score of 100% on each test.
      i. If a perfect score is not obtained, review videos for clarification.

3. In laboratory:
   a. Follow steps of the Job Operation Sheet to practice using tool.
   b. Upon completion, report to the instructor station with JOS for assessment of steps and feedback.

The following expectations are for teachers working with the agricultural mechanics skill development model:

**Instructor:**

1. Preparation of materials for students (minimum of 5 days prior to class):
   a. Provide students with link/access to videos of tools you are going to cover (usually 2-3 tools).
   b. Provide students with safety rules for the tools
2. Preparation of class/laboratory (prior to class starting on day of):
   a. Have safety tests ready for students to take (preferably online versions for immediate feedback).
   b. Set up laboratory with practice stations for tools covered.
   c. Set up an instructor station where you can see all stations without having to move.

3. In class:
   a. Answer clarification questions and reinforce any pertinent information with allocation of time for this task restricted to no more than 5 minutes.
   b. Administer safety tests and grade when students are done.

4. In laboratory:
   a. Hand out skill Job Operation Sheets and break class into rotation groups.
   b. Station yourself at the instructor station.
   c. Observe students practicing tool skills from instructor station.
   d. As students come to the station, score the steps of the JOS according to what you observed and provide feedback on where the student needs to improve.

Conclusions/Implications/Recommendations

Numerous conclusions can be drawn from this study. First, the instructor indicated he felt more organized and effective in my instruction to the students. This method of instruction has resulted in less time wasted in the laboratory and students having a more structured experience (Shoulders, Blythe, & Myers 2013). Instruction was more individualized for each student as less of the instructor’s time was spent moving from student to student trying to identify their struggles. The students’ interaction with the instructor was more directed because they approached the instructor for assessment after completing the steps as outlined on their JOS. This model of instruction has led to more efficient and effective means in delivering technical knowledge in regard to agricultural mechanics to pre-service teachers (Leiby, Robinson & Key, 2013).

This method of instruction provides a direct opportunity for students to develop across all stages of the psychomotor skill development model (Phipps et al., 2008). Instructors need to focus on skill development in agricultural mechanics instruction before moving the students to experienced-based application projects. If teachers do not take the time in agriculture mechanics to allow students to develop the foundational skills as outlined in the psychomotor development model, when put into application experiences students may not be equipped to transfer the experiential piece beyond basic skill practice and to real world application (Roberts & Ball, 2009). By not focusing on skill development prior to providing more application experiences, students cannot move beyond a concrete experience (Kolb, 1984) and into a reflective or active experience level (Shoulders & Myers, 2013).

An implication drawn from the study is that students are potentially more confident in their skills for teaching in the agricultural mechanics laboratory through the use of the agricultural mechanics skills development model as compared to our original method of teaching at the start of the course. The use of this teaching model allowed more time and structured feedback to students, thus allowing them to increase their confidence levels in using and teaching the tools covered. This teaching model worked in the college setting, in which the course only met once a
week. An important implication is that the pre-service teachers can transfer this model for use in their future classrooms. This concept is central to the topic of pedagogical content knowledge (PCK). PCK has been demonstrated to be a powerful concept in preparing future teachers to teach content specific curriculum (Shulman, 1986, 1987). When applied to this context, we have given the pre-service teachers the content knowledge (skills with tools) and pedagogical content knowledge (agricultural mechanics skills development) to use with their future students. However, whether the students will be able to show reciprocal content knowledge when they begin teaching remains to be seen.

We recommend further studies on the agricultural mechanics skill development model to verify its transfer potential in a school-based agriculture education setting. As the method has shown success in a college setting, it is not clear from the study how it will work in school-based agriculture education programs. Additionally, it is suggested that further studies be conducted in regard to the integration of this teaching method in other agricultural education teacher preparation courses, which focus on teaching in laboratory settings. Development of sound practitioners in both the classroom and laboratory is essential.

Many pre-service agriculture teacher training programs are limited in time available to help students develop their confidence in regard to the content of all pathways in school-based agricultural education. More research should be conducted to understand whether increasing the amount of differentiated pedagogical methods of instruction for laboratory-based and skill-based content (i.e., PCK) would increase pre-service teacher confidence levels in regards to teaching in tool-based or hands-on areas. Finally, we recommend that more action research projects be conducted in the field of school-based agricultural education. The benefits of an action research approach are numerous (Hendricks, 2013). Most importantly, this study confirms that the act of an instructor reflecting on practice in conjunction with having students provide direct feedback is essential to developing effective instructional strategies.

References


Reducing Beginning Welders’ Anxiety by Integrating Virtual Reality Simulations

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Abstract

This study examined the use of virtual reality to reduce the anxiety of individuals in a welding training program. Byrd and Anderson (2012) posited that with the need for welders finding a more efficient way of training has become a necessity. With the multiple safety concerns related to the welding profession numerous triggers of anxiety are present. This study utilized the VRTEX® 360 virtual reality welding simulator to examine if virtual reality could reduce anxiety in welders. Several training programs were utilized that integrated the virtual reality welding simulator. Researchers recorded anxiety related measures by utilizing a BioHarness® data logger system. Live readings were recorded via the BioHarness® and a laptop. The measures that were collected related to anxiety included heart rate, respiration rate, body temperature, and pulse. Participants were also video recorded during the completion of test welds to help aid in identifying triggers of anxiety during the welding process. It can be concluded that all participants experienced anxiety during the completion of test welds and it affected the ability to produce a passing weldment. This implies that if industry can reduce the amount of anxiety trainees would experience it may lead to a higher percentage of welding certifications.

Introduction

Anxiety is a tense and unsettling anticipation of threatening event which has a negative effect on a person, yet the cause is unknown (Rachman, 2004). Anxiety and fear are closely related due to the fact of that both feelings have a negative effect on a person, which has led to the two words being used interchangeably (Barlow, 1988; Goodwin, 1986; Rachman, 2004). Distinctions between the two can be made in order to understand how each feeling affects a person. Rachman (2004) stated that distinctions could be made between the causes, duration, and maintenance of fear and anxiety. Fear is described as a reaction to a specific, perceived danger, and identifiable threat (Rachman, 2004). Reactions to fear are usually intense and recedes after the danger is removed (Rachman, 2004). On the other hand, anxiety is described as a heightened vigilance than an emergency reaction, which causes an uneasy tension where the cause is not readily identifiable (Rachman, 2004). Anxiety can be experienced at any given time or place.

Several types of anxiety are known that a person can suffer from but this study will looked at social anxiety and social phobia because of the social nature of a learning environment. The terms social phobia and social anxiety are used interchangeably and are associated with social anxiety disorder (Barlow, 1988; Rachman, 2004). The critical feature of social anxiety is an intense and a persistent fear of social or performance situations (Barlow, 1988; Goodwin, 1986; Rachman, 2004). The manifestation of anxiety symptoms can take many forms because the anxiety is experienced in social situations (Barlow, 1988; Goodwin, 1986; Rachman, 2004). The innate fear of possible scrutiny because they might behave in a manner that is embarrassing, unacceptable, or perform ineptly occurs within people that suffer from social anxiety (Rachman, 2004).
The individuals that suffer from social phobia contain a predisposition to feel anxious in social situations (Rachman, 2004). Rachman (2004) stated that cognitive theorists have three beliefs about people that suffer from social anxiety: 1) perfectionist standards for social performance; 2) false beliefs about social evaluation; and 3) negative views about the self. Another difference is a more direct focus especially on internal feelings and their significance, including if the emotional state that a person is in is visible to others (Rachman, 2004).

A person suffering from social anxiety may misinterpret the emotional reactions of others as an indication that others are criticizing them making the individual think they are the center of attention (Rachman, 2004). During the interpretation of others emotions, a person would respond to a threat as if the people can see that they are inept or inadequate within the social situation (Rachman, 2004). If the person interprets the emotional reaction as benign, a friendly or accepting feeling will occur and anxiety will subside (Rachman, 2004). If the reaction is interpreted as harmful, the person would get the feeling that they may be shunned or rejected (Rachman, 2004). If an individual experiencing social anxiety interprets a reaction as negative it may lead them to escape, avoid, cope, or block that social interaction from happening again (Rachman, 2004).

Although symptoms of anxiety are mostly negative; however, in a workplace positive results can be seen from anxiety and stress (Stein & Hollander, 2003). Anxiety and stress in some degree is always present in the workplace and can be a beneficial source of motivation (Stein & Hollander, 2003). The concept of anxiety and stress in the workplace and learning how to manage them are widely accepted, but there are people who believe that they are the victim of anxiety and stress (Stein & Hollander, 2003).

Having employees that suffer from anxiety and stress can have detrimental to the rest of an organization (Pflanz & Heidel, 2003). Poor job performance, job dissatisfaction, absenteeism, and interpersonal conflict can be exhibited by workers that suffer from stress and anxiety (Pflanz & Heidel, 2003). Psychiatric illnesses have been shown to affect at least 48% of Americans during their lifetime (Pflanz & Heidel, 2003). Across the U.S., approximately 30% of the population has deals with anxiety related illnesses annually (Pflanz & Heidel, 2003). Pflanz and Heidel (2003) found that anxiety related disorders cost industries approximately $4 billion per year, which 88 percent is attributable to decreased productivity. One such workplace that could be affected by anxiety disorders is a welding training program.

In a welding environment, anxiety may be triggered by many different things. A majority of the triggers that may lead to anxiety stem from the safety issues related to welding. Some of the safety related issues include electrical shock, compressed gases, air contamination, fire, explosion, and arc radiation (Cary & Helzer, 2005; Jeffus, 2012). Electrical shock is a concern because of the amount of volts being used while welding. Voltage range between 115 to 460 volts for most alternating current (AC) sources, but fatalities can occur with equipment using less than 80 volts (Jeffus, 2012). The welding arc emits ultra-violet (UV) rays also known as arc radiation is harmful (Cary & Helzer, 2005; Jeffus, 2012). The UV rays emitted can cause flash burn to unprotected eyes and severe sunburns to exposed skin while welding (Cary & Helzer, 2005; Jeffus, 2012).
Air contamination comes in two forms through the process of welding, particulate matter and gases (Cary & Helzer, 2005). The smoke or fumes rising from the welding operation are identified as air contamination (Cary & Helzer, 2005). The hazard is created by the metal being welded, chemical composition of the flux, and the length of time a welder is exposed to the fumes (Cary & Helzer, 2005). Welding in an area not suitable for welding and the fact that sparks can travel up to 40 feet contacting flammable substances can cause fire and explosions (Cary & Helzer, 2005; Jeffus, 2012). Safety concerns with compressed gases revolve around the gas cylinders used to provide the shielding gas for various welding operations (Cary & Helzer, 2005; Jeffus, 2012). Inadvertently breaking off the tank valve allowing the cylinder to act as a rocket the major concern with gas cylinders is (Cary & Helzer, 2005).

With all the different types of safety issues related to the welding occupation it is clear that those individuals that are beginning welders may exhibit more anxiety related symptoms. Ursano, Fullerton, Wiesaeth, and Raphael (2007) postulated that inexperienced disaster volunteers may be at a higher risk for acute effects of psychological discomforts than experienced personnel. Understanding that inexperienced individuals may exhibit more symptoms of anxiety it is imperative to examine methods of reducing anxiety within a training programs. Reducing an individual’s anxiety level may lead to increase levels of performance (Pflanz & Heidel, 2003).

One suggested method that may lead to reduced anxiety in beginning welders is the integration of virtual reality simulations (Byrd & Anderson, 2012). Kunkler (2006) stated that the utilization of simulations provides a safe realistic computer-based environment for individuals to practice. Virtual reality environments can be used to train workers to acquire the basic skills necessary to perform the tasks required for a job in a technical field (Manca, 2013). The utilization of virtual reality simulations allows trainees to learn basic skills within a safer environment (Lucas, Thabet, & Worlikar, 2007). One study found that full and partial virtual reality integration into a welding training program was appropriate, depending on the level of task difficulty (Stone, McLaurin, Zhong, & Watts, 2013). Would the introduction of virtual reality into a welding training program lead to the reduction of anxiety exhibited by inexperienced individuals?

**Theoretical Framework**

The guiding framework of this study is the model of anxiety by Rachman (2004). Rachman (2004) describes anxiety as a process and not a categorical event that does or does not happen. Anxiety as described by Rachman (2004) is a feeling that is created through several cognitive realizations. The susceptibility of a person to experience anxiety is termed vulnerability (Rachman, 2004). The degree of vulnerability varies from person to person (Rachman, 2004). Temperamental vulnerabilities are not controlled by one’s mind and are experiential and biological in nature (Rachman, 2004). Cognitive vulnerabilities are shaped from personal experiences and present beliefs, which are controlled by one’s mind (Rachman, 2004). One’s susceptibility to anxiety is put to the test once they enter a new or unfamiliar environment. A person predisposed to anxiety becomes hypervigilant upon entering an environment (Rachman, 2004). Hypervigilence be seen when a person begins global scanning, where a person has rapid eye movement throughout the visual field (Rachman, 2004). When global scanning, a person will first broaden their attention to detect any threats, and if a threat is found the person’s attention will narrow as the threat is being processed (Rachman, 2004). Hypervigilance is usually not found once a person overcomes their anxiety disorder (Rachman, 2004).
Focused attention refers to people who found a threat, the person focuses all of their attention solely on the threat and appears inattentive to everything else around them (Rachman, 2004). Perceptual enhancement or distortion relates to people who have extreme cases of anxiety (Rachman, 2004) An example is once an individual leaves a familiar place are they fixated on globally scanning for threats to the point it is all that they do (Rachman, 2004). When a person enters an environment and detects a threat but decides to find a place of safety to avoid the threat is referred to as behavioral inhibition (Rachman, 2004). The information gathered from global scanning and focusing one’s attention on a threat is utilized to determine if the threat is benign or harmful (Rachman, 2004). Rachman (2004) posited that misinterpretations have two dimensions where the probability or the seriousness of an event occurring is exaggerated.

Rachman (2004) stated that if a threat were found to be benign no anxiety would occur. If a threat is found to be harmful a person will attempt to reduce the effects of their anxiety (Rachman, 2004). There are four common ways a person can reduce the effects of anxiety has on themselves, which include escape, avoid, cope, and block (Rachman, 2004). Once a person experiences anxiety, the individual will try to reduce the effect by escaping as quickly as possible (Rachman, 2004). If this occurs at the same place, several times the same person will begin to avoid the place (Rachman, 2004). To cope with not being able to go to the place an individual might ask someone else to go there for them or accompany them (Rachman, 2004).

Purpose and Objectives

The purpose of this study was to examine the effect of virtual reality on anxiety in participants in a welding training program. In addition, the study sought to describe the effect anxiety susceptibility has on participants visual inspection pass/fail rating on test welds. This study also intended to describe the relationship between the time participants experienced anxiety while completing the test welds and the visual inspection pass/fail rating. The insight gained relating to how anxiety affects beginning welders can benefit welding training programs as well as any educational setting that teaches welding based skills such as an agricultural education program. The following objectives were identified to address the purposes of this study.

1. Describe the average welding program trainee in terms of susceptibility to anxiety.
2. Examine the pass/fail rating of visual inspection of test welds performed by participants.
3. Determine if a relationship exists between participants’ susceptibility to anxiety and the visual inspection pass/fail rating.
4. Examine the number of instances participants exhibited anxiety in terms of ECG heart rate spikes.
5. Determine if a relationship exists between participant’s anxiety to the visual inspection pass/fail rating.
6. Identify the triggers of anxiety experienced by participants during the completion of test welds.

Methods

This study is a small portion of a larger study that utilized a virtual reality integrated welding school and real-world welding school. The welding schools were constructed at the agricultural
mechanics laboratory located on the Iowa State University Farm. The real-world welding school was overseen by a certified welding instructor (CWI) during this study. The virtual reality school was overseen by the researchers. The materials stocked for the real-world welding school included welding jackets, gloves, slag hammers, wire brushes, auto-darkening welding helmets, Miniflex® Portable weld fume control units, and Power Wave® C300 multi-purpose welders. The consumable material used included 3/8 inch thick coupons (groove weldments), 1/2 inch thick coupons (Tee weldments), and Excalibur® 7018 electrodes conditioned in an electrode oven.

The virtual reality welding school was overseen by the researchers. The researchers were extensively trained to how to use the VRTEX® 360 Virtual Reality Arc Welding Trainer. The virtual reality welding school was equipped with three VRTEX® 360 Virtual Reality Arc Welding Trainers with shielded metal arc welding (SMAW) stingers, helmet, and plastic coupons. This trainer was chosen because it was the highest fidelity virtual reality simulator currently available. This virtual reality simulator allows users to be fully immersed in a 3D virtual reality welding environment. For the virtual training, users wore a welding helmet with integrated stereoscopic virtual reality screens and used dynamic visual feedback, in the form of visual overlays, for known welding variables.

Participants
Before any training took place, participants were given an informed consent form. There were 20 male participants and 3 female participants randomly assigned to either the integrated training (15 participants) or the VR training (eight participants). The number of participants was initially limited to have a student to CWI ratio that was representative to a real-world welding training program, which generally do not exceed 12 students at a time. Participants fell into two groups of experience. The first group had little to no practical experience in SMAW prior to the beginning of the study. The second group had practical experience in SMAW, but did not hold any welding certifications. The amount of experience of the participants was not known until after participants were grouped in order to create a true random sampling. Participants chose to complete either a one or two week welding training program. The one week training program taught the participants how to SMAW the 2F (horizontal fillet weld) and 1G (flat groove weld) welds. The two week training program additionally taught the 3F (vertical fillet weld) and 3G (vertical groove weld) welds.

The experimental groups that participants were randomly assigned into included: 100% virtual reality training; 75% virtual reality and 25% real-world training; and 50% virtual reality and 50% real-world training. The participants received safety training before entering into the welding environment. Within the VR training room, participants received instruction from the researchers on how to use the VRTEX® 360 Virtual Reality Arc Welding Trainers. In the virtual reality training, participants worked in groups of three or four per VRTEX® 360. In the real-world training, participants had individual welding booths, but could work together if they wanted. While in the real-world welding training portion the participants received instruction from the CWI on how to use the Power Wave® C300 multi-purpose welders. The schedule for the weld training program was as follows: Monday through Thursday was practice time and Friday was test day. The only exception to this schedule was the 100% virtual reality group. The 100% virtual reality group received real-world training on Thursday afternoon to acclimate to real-world welding so that participants could perform the test welds on Friday.
In order to assess anxiety levels participants filled out the Zung (1971) self-rated anxiety scale (SAS) and electrocardiogram (EKG or ECG) readings were taken. The Zung (1971) SAS was used to measure the participants’ susceptibility to anxiety. The Zung (1971) SAS is a survey instrument that utilized 20 statements that dealt with how an individual might feel when anxious. The participants rated each statement on a summated rated scale of none or a little of the time, some of the time, good part of the time, or most of the time (Zung, 1971). The responses given were then converted into a point system between one through four. The points were then added together giving an overall raw score. The raw score was then converted into an anxiety index. The anxiety index ranges from 25 to 100. Zung (1971) recommended the following scale to interpret the anxiety index: 25 – 45 = normal range; 45 – 59 = minimal to moderate anxiety; 60 – 74 = marked to severe anxiety; and 75 - 100 = extreme anxiety. This interpretation was used to describe participants’ susceptibility to anxiety.

The ECG measurements collected included blood pressure, respiration rate, temperature, and pulse rate. Heart rate was utilized because prior research has linked heart rate to anxiety (Shinba, Kariya, Matsui, Ozawa, Matsuda, & Yamamoto, 2008). To obtain these measures participants wore a BioHarness® data logger system. The BioHarness® is a chest strap that has two sensors and a removable transmitter/logger built in. Data was streamed live to a laptop computer and logged onto the built in transmitter/logger. To accurately identify periods of anxiety a basal reading was taken for all participants while standing at rest. The basal reading was taken in a standing position because the real-world welding stations used required the participants to stand while welding. The basal reading was compared to the ECG measurements to identify moments of anxiety, specifically utilizing an individual’s heart rate. The participants were also recorded as they welded their certification plates via a closed-circuit camera system. The recordings of the participants’ test welds were utilized to help identify the cause(s) of anxiety when present.

The data were analyzed using Microsoft Excel 2010 and Predictive Analytics SoftWare (PASW) Statistics 18 software package. Descriptive statistics were calculated to identify frequencies for pass/fail rates and dexterity percentile rankings. A bivariate correlation was calculated to examine the relationship between participants’ susceptibility to anxiety and visual pass/fail rates. With a numerical variable and a dichotomous variable utilizing the bivariate correlation calculation is needed to evaluate the relationship between the variables (Gravetter & Wallnau, 2009). Researchers utilized the r squared (r2) statistic to examine the effect size of the bivariate correlation. To evaluate the effect size of a bivariate correlation Gravetter and Wallnau (2009) indicated that r2 should be used.

Results

This study sought to describe the effect of virtual reality on anxiety in welders in a welding training program. The intent of objective one was to describe the participants’ susceptibility to anxiety as measured with the Zung (1971) SAS instrument. The results are shown in Table 1. Out of the 23 participants in the study, only two participants exhibited a susceptibility to anxiety in the range of minimal to moderate. The other 21 participants fell into the normal range of anxiety susceptibility. The two participants that had the higher susceptibility to anxiety were in the 75 percent virtual reality to 25 percent traditional and 100 percent virtual reality groups.
Table 1

*Anxiety Susceptibility of Participants by Welding Training Program*

<table>
<thead>
<tr>
<th>Program Type</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>21</td>
<td>91.3</td>
</tr>
<tr>
<td>Minimal - Moderate</td>
<td>2</td>
<td>8.7</td>
</tr>
<tr>
<td>50/50 VR/Trad.(^a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>4</td>
<td>100.0</td>
</tr>
<tr>
<td>Minimal - Moderate</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>100 VR(^a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>4</td>
<td>100.0</td>
</tr>
<tr>
<td>Minimal - Moderate</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>50/50 VR/Trad.(^b)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>6</td>
<td>100.0</td>
</tr>
<tr>
<td>Minimal - Moderate</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>75/25 VR/Trad.(^b)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>4</td>
<td>80.0</td>
</tr>
<tr>
<td>Minimal - Moderate</td>
<td>1</td>
<td>20.0</td>
</tr>
<tr>
<td>100 VR(^b)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>3</td>
<td>75.0</td>
</tr>
<tr>
<td>Minimal - Moderate</td>
<td>1</td>
<td>25.0</td>
</tr>
</tbody>
</table>

*Note.* VR = virtual reality. Trad. = Traditional

\(^a\)One week training program utilizing VRTEX® Mobile.

\(^b\)Two week training program utilizing the VRTEX® 360.

Objective two sought to describe participants’ visual inspection pass/fail rate of completed test welds. The overall results are shown in Table 2. Overall the participants in this study had an even pass/fail rate (n = 38, 50.0%) of the 76 test welds completed. Only two welding training programs visually failed a majority of the test welds. The two training programs were the one-week 50 percent virtual reality to 50 percent traditional and two-week 50 percent virtual reality to 50 percent traditional groups. The program that exhibited the highest percentage of test welds that failed inspection (n = 7, 87.5%) was the one-week 50 percent virtual reality to 50 percent traditional training program. When examining the pass/fail rates by weld type, the participants visually passed more of the simple welds (2F and 1G, 56.5%) than the complex welds (3F and 3G, 43.5%).
Table 2
Visual Inspection Pass/Fail Rates of Participants’ Test Welds by Program Type

<table>
<thead>
<tr>
<th>Program Type</th>
<th>n</th>
<th>Pass f (%)</th>
<th>Fail f (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>76</td>
<td>38 (50.0)</td>
<td>38 (50.0)</td>
</tr>
<tr>
<td>50/50 VR/Trad.</td>
<td>8</td>
<td>1 (12.5)</td>
<td>7 (87.5)</td>
</tr>
<tr>
<td>100 VR</td>
<td>8</td>
<td>6 (75.0)</td>
<td>2 (25.0)</td>
</tr>
<tr>
<td>50/50 VR/Trad.</td>
<td>24</td>
<td>10 (41.7)</td>
<td>14 (58.33)</td>
</tr>
<tr>
<td>75/25 VR/Trad.</td>
<td>20</td>
<td>11 (55.0)</td>
<td>9 (45.0)</td>
</tr>
<tr>
<td>100 VR</td>
<td>16</td>
<td>10 (62.5)</td>
<td>6 (37.5)</td>
</tr>
</tbody>
</table>

Note. VR = virtual reality, Trad. = traditional

a One week training program utilizing VRTEX® Mobile.
b Two week training program utilizing the VRTEX® 360.

The relationship between the visual pass/fail rate and participants’ susceptibility to anxiety was examined for objective three. To determine if any relationship existed between the two variables a bivariate correlation was calculated. The results of the bivariate correlation can be seen in Table 3. The results showed no statistical significance between the average participant susceptibility of anxiety and visual inspection pass/fail rate for any test weld type.

Table 3
Bivariate Correlation of Average Participants’ Susceptibility of Anxiety and Visual Inspection Pass/Fail Rates by Weld Type

<table>
<thead>
<tr>
<th>SMAW Weld Type</th>
<th>n</th>
<th>r</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>2F</td>
<td>23</td>
<td>-.271</td>
<td>.212</td>
</tr>
<tr>
<td>1G</td>
<td>23</td>
<td>-.131</td>
<td>.551</td>
</tr>
<tr>
<td>3F</td>
<td>15</td>
<td>.207</td>
<td>.459</td>
</tr>
<tr>
<td>3G</td>
<td>15</td>
<td>-.026</td>
<td>.926</td>
</tr>
</tbody>
</table>

To examine if the type of welding training program had an effect, researchers examined the correlation by the type of welding training program. The statistically significant results of the bivariate correlation between the average participants’ susceptibility of anxiety and visual inspection pass/fail rate by welding training program type are shown in Table 4. The only statistically significant relationship was between participants’ susceptibility to anxiety was with the 2F weld from the 100 virtual reality training program utilizing the VRTEX® 360 (p = .000). To interpret the magnitude of the relationship the researchers calculated r squared (r2) following the suggestions of Gravetter and Wallnau (2009). To interpret r2 Gravetter and Wallnau (2009) suggested using the following scale: 0.01 = small effect; 0.09 = medium effect; 0.25 = large effect. In this instance, participant susceptibility of anxiety had a very large effect (r2 = 1.00) on the visual inspection pass/fail rate.
Table 4
Portion of Bivariate Correlation of Average Participants’ Susceptibility of Anxiety and Visual Inspection Pass/Fail Rates by Training Program

<table>
<thead>
<tr>
<th>SMAW Weld Type</th>
<th>n</th>
<th>r</th>
<th>p</th>
<th>r²</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 VRa</td>
<td>2F</td>
<td>4</td>
<td>-1.00</td>
<td>.000</td>
</tr>
</tbody>
</table>

Note. VR = virtual reality, Trad. = traditional
aTwo week training program utilizing the VRTEX® 360.

Researches sought to examine the number of times participants exhibited anxiety during the completion of test welds for objective four. To determine the number of instances that participants exhibited anxiety researchers utilized the ECG readings and counted the number of spikes in heart rate above the initial basal readings for participants. When examining the one-week training session, the 100 VR group on average experienced anxiety more than the 50/50 VR/Traditional group. The same trend was seen within the two-week training program. Also in the two-week training programs, the average number of times anxiety that was experienced decreased between the welding positions. This trend was seen in all three variations of training programs in varying degrees. Table 5 displays the average of number of instances of anxiety by training group and by welding position.

Table 5
Average number of instances of Anxiety by Training Group and Welding Position

<table>
<thead>
<tr>
<th>Training Program</th>
<th>Flat Position n(M)</th>
<th>Vertical Position n(M)</th>
<th>Overall n(M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50/50 VR/Trad.a</td>
<td>34 (8.5)</td>
<td>-</td>
<td>34 (8.5)</td>
</tr>
<tr>
<td>100 VRa</td>
<td>33 (11)</td>
<td>-</td>
<td>33 (11)</td>
</tr>
<tr>
<td>50/50 VR/Trad.b</td>
<td>39 (6.5)</td>
<td>32 (6.4)</td>
<td>71 (11.8)</td>
</tr>
<tr>
<td>75/25 VR/Trad.b</td>
<td>39 (7.8)</td>
<td>28 (5.6)</td>
<td>67 (13.4)</td>
</tr>
<tr>
<td>100 VRb</td>
<td>33 (8.25)</td>
<td>26 (6.5)</td>
<td>59 (14.75)</td>
</tr>
</tbody>
</table>

Note: VR = virtual reality, Trad. = traditional
aOne week training program utilizing VRTEX® Mobile.
bTwo week training program utilizing the VRTEX® 360.

In objective five, the researchers analyzed data to determine if a relationship existed between participant anxiety, in terms of heart rate and breathing rate, to the visual inspection pass/fail rate. A bivariate correlation was calculated to determine if any relationships did exist. The significant results are shown in Table 6. Not all the weld types had shown a statistically significant relationship with the overall anxiety measures of heart rate and breathing rate. The 3F – SMAW weld type indicated statistical significance with the minimum heart rate (r = .736, p < .01) and average heart rate (r = .750, p < .01) on test day of week 1. Also, the 3F – SMAW weld shown a significant relationship with the maximum heart rate (r = .770, p < .01) during test day during week two. The other welds that the bivariate correlation indicated a statistical relationship with heart rate or breathing rate included the 2F and 3G in SMAW and 1G, 3F, and 3G in GMAW.
When examining the magnitude of the relationships indicated between participant anxiety measures and weld types, Gravetter and Wallnau (2009) indicated that $r^2$ should be used. The results of the $r^2$ calculations can be seen in Table 6. Gravetter and Wallnau (2009) suggested the following scale when interpreting the $r^2$ statistic: $0.01 = \text{small effect}; 0.09 = \text{medium effect}; 0.25 = \text{large effect}$. The 2F–SMAW weld type and the maximum breathing rate on test day of week one was the only relationship to display a medium effect size. The other significant relationships display a large to very large effect size.

Table 6
Portion of Bivariate Correlation ($r$) and Effect Size ($r^2$) of relationships between Participant Anxiety Measures and Visual Inspection Pass/Fail Rates

<table>
<thead>
<tr>
<th>Weld Type/Anxiety measure</th>
<th>2F-SMAW</th>
<th>3F-SMAW</th>
<th>3G-SMAW</th>
<th>1G-GMAW</th>
<th>3F-GMAW</th>
<th>3G-GMAW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HR – Min</td>
<td>.736**</td>
<td>(0.541)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HR – Max</td>
<td>-.497*</td>
<td>(0.247)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HR – Avg</td>
<td>.750**</td>
<td>(0.562)</td>
<td>.632*</td>
<td>(0.399)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BR – Min</td>
<td></td>
<td></td>
<td></td>
<td>.497*</td>
<td>(0.247)</td>
<td></td>
</tr>
<tr>
<td>BR – Max</td>
<td>-.446*</td>
<td>(0.198)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Week 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HR – Max</td>
<td>.770**</td>
<td>(.592)</td>
<td></td>
<td></td>
<td>-.713**</td>
<td>(.508)</td>
</tr>
<tr>
<td>BR – Min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.713**</td>
</tr>
<tr>
<td>BR – Max</td>
<td>-.562*</td>
<td>(.315)</td>
<td>-.626*</td>
<td>(.391)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: $r(r^2)$, **$p < .01$, *$p < .05$. HR = heart rate, BR = breathing rate.

To examine if the training program type had an effect on the relationship between anxiety measures and the visual inspection pass/fail rates the data was separated by training program types. The 3F–SMAW weld type has statistical relationships with five anxiety related measures. When examining the weld types, the four complex welds all have statistical significant relationships with anxiety related measures. The two-week 50/50 virtual reality to traditional training method utilizing the VRTEX® 360 revealed the largest number of statistical relationships. Whereas, the one-week 100 percent virtual reality training method utilizing the VRTEX® Mobile shown no statistical relationships. Following the suggestions by Gravetter and Wallnau (2009) all the relationships found have a large magnitude.

To further examine the relationship between participant anxiety and the visual inspection pass/fail rate, a bivariate correlation was calculated between the average number of instances participants experienced anxiety and the visual inspection pass/fail rate. Only two instances of
statistical significance were found. The two weld types that shown statistical significance were the 2F ($r = .448, p = .036$) and 3F ($r = .530, p = .042$). When examining the magnitude of the relationships, anxiety exhibited a medium effect on the 2F ($r^2 = 0.20$) and a large effect on the 3F ($r^2 = 0.28$) weld types.

Objective six sought to identify triggers of anxiety during the completion of test welds. The identification of anxiety triggers were identified by utilizing the logged ECG readings and the video recordings of the participants test welds. Moments of anxiety were identified by using an individual’s basal ECG reading and comparing that to the ECG readings during the individuals test weld. Time stamps were used to pin point the moment during the video recordings to identify what may have caused an individual’s anxiety.

The following results were present during all the training sessions of this study. In the flat position test welds moments of anxiety were present at various times during the welding process such as before the weld, starting the weld, during the weld, completing the weld, and afterward the weld was completed. Several participants revealed anxiety while setting up their weldments in preparation of beginning the welding process. This was identified by participants practicing the psychomotor skills needed prior to striking an arc and shuffling the weldment around trying to get in a better position to perform the weld. Multiple participants revealed anxiety was at the start of the weld. Identified anxiety triggers of participants at the beginning of a weld were the electrode sticking while trying to establish an arc and an arc not being established while striking the electrode.

Several participants experienced anxiety during the welding process. The identification of the triggers in several cases was impossible due to the participants blocking the view of the camera. The anxiety triggers that was identified included moments when the participants realized they were either at the wrong travel/work angles or off position with the bead. These indicators were identifiable by the participants shifting their hands and body position. Another anxiety trigger was stopping a weld and trying to start it back. Finishing out a weld properly was another time in which participants exhibited anxiety. Several participants’ anxiety was triggered once they realized they did not completely finish out a weld or realized the weld was poor. Not properly finishing out a weld refers to participants running out of an electrode before reaching the end of a weldment. The most common time that participants’ anxiety was triggered was after a weld was completed. After a weld was completed, all participants had to chip away the protective slag covering left by the flux and clean the weld with a wire brush. Anxiety was identified in most participants during the chipping and cleaning phase after a weld.

**Conclusions and Discussion**

Several conclusions can be drawn from the results of this study. First, one trend that was identified was anxiety susceptibility was normal, but participants experienced anxiety during the completion of test welds. Pflanz and Heidel (2003) postulated that anxiety could have a negative effect on job performance. The pass/fail rate of the test welds reinforces the notion of Pflanz and Heidel (2003). It can also be concluded that participants’ susceptibility to anxiety did not affect the chances of passing or failing a test weld. Although participants experienced anxiety during the completion of weld tests does not relate to participants being susceptible to anxiety. This
conclusion leads to the question, is the Zung (1971) SAS appropriate to access anxiety susceptibility for a welding training program?

Another conclusion that can be drawn is that participants’ heart rate during the completion of test welds did affect the ability to produce a passing weldment. The increase in heart rate could be an indication from the participants that the triggers of anxiety could be harmful. Rachman’s (2004) model of anxiety portrays harm as being directed at an individual mentally or physically. The manner that the anxiety trigger could be harmful in the present study might not represent harm as Rachman (2004) describes, but harmful to the weldment causing the weldment to fail visual inspection. Furthermore, the subsequent passing or failing of the weldment by the CWI could create harm as described by Rachman (2004). The participants in the present study all reacted to the anxiety triggers in the same manner, by coping with it and completing the test welds.

Furthermore, the number of instances anxiety was experienced also shown an effect the completion of test welds. One trend that can be identified is that as the percent of virtual reality training goes up so did the number of instances anxiety was experienced. In addition, the number of instances of anxiety decreased from the flat to the vertical position. This could be because the participants are becoming more familiar with the welding environment and are able to cope with the anxiety, as suggested by Rachman (2004).

Lastly, anxiety did have an effect on an individual’s ability to complete a weldment that would pass visual inspection. The effect of anxiety had may be linked to the action of focused attention as described in Rachman’s (2004) model of anxiety. When an individual noticed that a mistake had occurred they might have focused their attention on how the mistake might affect the ability to pass visual inspection by the CWI, instead of on the weld being performed.

Recommendations

Conclusions from this study lead to several recommendations. First, it is recommended that welding programs prepare trainees for the anxiety triggers, highlighted in this study, during the training program to reduce the effect during the completion of certification test welds. With the high need of welders, it is imperative to create an environment that is conducive to learning and not to triggering anxiety in trainees. By utilizing an instrument that assesses an individual’s susceptibility could allow a welding training program to create separate training groups. By employing groups can allow the instructor to utilize different teaching methods better suited to the individuals susceptible to anxiety.

It is recommended that training program utilize teaching methods and strategies that are proven to reduce anxiety in both formal and informal instructional settings. Whether that be evaluating various transitioning schedules from virtual reality to a real welding booth. This might include having students that exhibit a susceptibility to anxiety to observe a certified welder to help acclimate to a real welding situation. The ability to acclimate an individual to a situation by placing them into it, but only allowing them to observe might lead to a reduced level of anxiety when the individual tries to complete the same task.
Future studies are recommended to further assess the ability of an individual’s level of susceptibility to anxiety to predict future performance by purposively selecting participants. Researchers also recommend utilizing various instruments that assess susceptibility to anxiety to determine if there is an instrument better suited for a welding training program. Purposively selecting participants will allow for a higher ratio of individuals susceptible to anxiety, than the present study.

References


The Influence of Information Formatting on Consumer Understanding of Beef Processing

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Abstract

As consumer understanding of the agriculture industry has declined, the need for consumer understanding is seen as imperative for the future of the industry. As agriculture strives to increase consumer understanding of agriculture and the various processes within its systems, there are questions as to whether the format of the message can impact the level of consumer understanding. The purpose of this research was to describe consumer cognitive understanding in relation to the meat-animal harvesting process and the potential impact message formats have on increasing understanding. A quasi-experimental, post-test only, control group design was executed. The population consisted of adults from the surrounding Lubbock, TX who were randomly assigned to one of four research groups (three treatments and a control group). A researcher-designed data collection instrument was administered to the four groups with 221 instruments completed. Results revealed that information formats, whether text, photographs and text, or video, will increase consumer understanding of beef cattle processing at the lower cognitive levels immediately following the treatment. Further research is needed to indicate whether these informational formats can also increase higher cognitive levels and if the change in understanding can be sustained over time.

Introduction

As time progresses, fewer people are choosing to return to the family farm to the point that less than two percent of Americans are engaged in farming as their primary profession (Vilsack, 2014). As Americans have moved away from the farm, whether for reasons of job opportunities, closer proximity to entertainment options, or other opportunities, their knowledge and understanding of the complexities involved in the agricultural system have regressed (Doerfert, 2011). Paradoxically, consumers are demanding to know how their food is processed, but do not know where to go for information (AFBF, 2002). In the grand scheme of things, agriculture influences everyone. Law et al. (1990) implied that men and women of all ages and ethnicities have a vested interest in the agriculture industry. From the food consumers eat, clothes they wear and products they use, such as insulin for diabetics, agriculture plays a vast role in consumers’ livelihood (Whitaker, & Dyer, 2000). However, consumers do not understand the macro implications sustainable agriculture has on society, as agriculture impacts the environment, economy, government, global marketplace, and science (Thomson, 1996). Lack of agricultural understanding aside, the significance and demand for agriculture are becoming increasingly important (Rutherford, 2008).

To meet demand of a growing world population efficiently, innovation, and technology has and will be the way farmers and ranchers see their products through production (Rutherford, 2008). While the fast pace and complexity of modern technology are essential to feeding a growing
population, Korthals (2001) suggests that it does not foster transparency, or the industry’s willingness to expose agricultural processes and production. Consequently, a lack of trust may leave consumers feeling like their concerns are not brought to public scrutiny (Korthals, 2001). This lack of trust ultimately serves as a barrier for agricultural consumers to strengthen their agricultural knowledge. Influence of the news media and society’s lack of trust for the agriculture industry pose several risks for the future of the industry. Brisk changes in trends such as organic and natural farming, ethanol production, international trade, buying local, environmental stewardship and genetic modification, all call for a reevaluation of current agricultural literacy methods (Kovar & Ball, 2013). A sound knowledge of the agriculture industry is necessary for consumers due to the fact that they make voting, policy, purchasing, education, and career choices (Doerfert, 2003).

**Literature Review**

Agricultural literacy efforts gained more focused attention with the 1988 release of the National Academy of Science released an agricultural education report titled Understanding Agriculture – New Direction for Education (Frick, Kahler, & Miller, 1991). Frick et al. (1991) defined agricultural literacy as “possessing knowledge and understanding of our food and fiber system. An individual possessing such knowledge would be able to synthesize, analyze, and communicate basic information about agriculture” (p. 52). Within the last two decades, numerous efforts have been put forth to combat an agriculturally illiterate society, but results have not proven to be successful (Kovar & Ball, 2013). Thomson (1996) indicated that “consumers, as individuals, will more likely become engaged in an issue when they perceive its relevance to them personally; that implies understanding” (p. 46). Further, what once was considered a national issue, has now expanded boundaries with increased agricultural trade in global markets, making agricultural literacy an international issue (Kovar & Ball, 2013).

Consumers have become media and information dependent and form their opinions about agriculture based on increased attention on sensational aspects of the industry (Anderson, 2010). Thomson (1996) stated that as the public has less first-hand experience with any issue, they are more likely to look to news sources for information. Pawlick (2001) indicated that urban populations have no interest in agricultural or rural affairs, therefore, setting the agenda for major news media outlets. When agricultural stories do make the news, they are event-based and conflictual (Reisner & Walter, 1994). Most recently, negative stories about meat processing and science revolving around food-safety outbreaks, animal welfare, and health concerns, have made major news headlines, often leaving consumers with a skewed perception (Goodwin & Shoulders, 2013). In a study co-sponsored by the American Farm Bureau Federation and Altria Corporate Services, three-fourths of consumers indicate the agriculture industry is doing a “fair” or “poor” job of explaining food production techniques (2002). Hartz and Chapell (1997) stated that scientists (including agricultural scientists) and reporters are both to blame for the public’s lack of scientific knowledge regarding agriculture. To solve the problem, scientists and journalists, the main contributors to the flow of information, will need to work together to take action (Hartz & Chappell, 1997).

The meat industry, in terms of the agriculture industry, has faced similar agricultural literacy issues. Frick, Birkenholz, and Machttmes (1995) discovered that agricultural processing, including animal processing, is an area where consumers have low concept levels. When it
comes to meat science and production, a number of negative stories have made the headlines in mainstream media throughout the last several years (Goodwin & Shoulders, 2013). Food safety outbreaks, meat product recalls, and inhumane treatment of animals, appear to be the first and only stories to make the news media’s agenda. Activist organizations, such as People for the Ethical Treatment of Animals and the Humane Society of the United States, also contribute to the meat industry’s negative reputation by using the guise of creating an informed public (Kovar & Ball, 2013).

It is no secret that consumers are demanding more transparency when it comes to the meat and poultry they eat, especially in regard to meat-animal processing (Riley, 2012). Images of the harvesting processes in particular can come across as cruel or brutal to the everyday consumer (Purdy, 2013). Purdy reported in the New York Times, “the most humane way of slaughtering an animal, or dealing with a sick one, may look pretty horrible. But so does open-heart surgery” (Purdy, 2013, para. 3). While several researchers indicate that experiential learning accelerates knowledge and understanding (Roberts, 2011), voluntary visits to a meatpacking plant is not possible. There are several reasons access to meatpacking facilities is controlled. Food safety is one of the primary reasons the public is not permitted to enter meat-processing facilities (Riley, 2012). Operations must also protect visitors from excessive machinery and knives used in processing plants, while also protecting employees from distractions (Riley, 2012). An excessive amount of visitors roaming these facilities can cause animals to become agitated and frightened, possibly leading to issues in animal welfare and human safety (Riley, 2012). Therefore, a potential way to inform consumers about the meat-animal harvesting process is through visual communication and educational methods.

Misperceptions about agriculture in general, including the meat industry, can be corrected (Wachenheim & Rathge, 2000). Visual communications, such as educational videos, can serve as a strong means for helping consumers understand the harvesting process. Cognition can be significantly improved by adding audio and video components to educational messages (Brashears, 2004). Videos like Oprah Winfery’s Inside a Slaughterhouse (2011) or the American Meat Institute’s video tour of a beef plant with Temple Grandin (2012) could help increase transparency regarding meat animal harvesting. Digging deeper, it is essential to consider that while constructing effective visual images is important, understanding a consumer’s cognitive processes and perceptions, or what is going on in the viewer’s mind, is just as imperative (Lester, 2011).

Little research has been conducted to determine the effects on consumer cognition through visual communication representative of agricultural topics. Society has become visually mediated and learns more from images and text, than text alone (Lester, 1994), which alludes that videos are an effective means to reach and educate consumers about the meat-animal harvesting process. By gaining a better understanding of consumer cognition in regard to messages portraying meat-animal harvesting, it could aid the agriculture industry in creating more effective consumer education and informational products. Understanding the psychological mechanisms behind visual and mass communication in influencing human thought is imperative (Bandura, 2001). The cognitive theory of multimedia learning serves as the base theory for this study. Multimedia learning is defined as learning from words and pictures, whether text is printed or spoken, and photos are static or dynamic (Mayer & Moreno, 2003). In other words, cognitive theory attempts to understand what is going on in a viewer’s mind while he or she is observing a form of visual
images (Lester, 2011). Utilizing this theoretical base provided insight to how consumers cognitively process visual messages. This cognition-based theory possesses several factors that can help agricultural communicators and organizations discover how to best construct visual messages.

**Purpose and Objectives**

Public and policy maker understanding of agriculture is a research priority for our profession (Doerfert, 2011). The purpose of this research was to examine consumer cognitive understanding in relation to the meat-animal harvesting process and the potential impact message format has on increasing their understanding. This study was guided by the following objectives:

1. Describe participant data in terms of age, gender, ethnicity, income, and educational level, their involvement in the agriculture industry and their beliefs toward animal processing. 2. Determine which form of visual message format (video, photographs and text, or text only) pertaining to beef harvesting, is the most effective in reaching higher levels of cognition in consumers.

Two null hypotheses were tested at the $p = .05$ level.

1. H01: There is no significant difference between the treatment and control groups on lower-level cognitive test scores.
2. H02: There is no significant difference between the treatment and control groups on higher-level cognitive test scores.

**Methodology**

This study utilized a quantitative, quasi-experimental research design to collect data from consumers in the Lubbock, Texas area. Data collection was administered through a researcher-developed educational instrument to agricultural consumers. Instruments were graded, coded, and analyzed for demographic data and relational data. A post-test only, control-group, randomized subject design was executed. The rationale for selecting this design was because participants could not be selected by randomization from the general population. The quantitative, independent variable consisted of the three treatment levels (video, photographs and text, or text only). The dependent variables measured in this study comprised of level of cognition. Illustrated in Figure 1, $R = \text{random assignment}$, $O = \text{posttest measures}$, $X1 = \text{video}$, $X2 = \text{photographs and text}$, $X3 = \text{text only}$, and $C = \text{control group}$

<table>
<thead>
<tr>
<th></th>
<th>R</th>
<th>X1</th>
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</tr>
<tr>
<td></td>
<td>R</td>
<td>C</td>
<td>O</td>
</tr>
</tbody>
</table>

*Figure 1: Gall, Borg, & Gall (2006) post-test only, control-group, randomized subject*
Potential participants were recruited by contacting local churches, businesses and organizations from the research participant database managed in the Department of Animal and Food Sciences at Texas Tech University. Organizations were contacted by a representative of that department approximately one month prior to the specified data collection day via email. The representative asked organizations for their participation by using an approved email script. Organizational contacts were provided an information sheet to inform their members about the study and the benefits of participating prior to agreeing to participate. An incentive of $20 per participant was proposed to serve as a fundraiser for these organizations with a maximum of 25 participants from each organization. Potential participants were required to be 18 years or older to participate. Two time slots were established in the evening to provide potential participants a choice of when to participate. A second email was sent mid-December reminding consumer groups about the study. Based on available funding the final sample was 221 participants.

Three information treatments were created and utilized for this study. The first treatment was American Meat Institute’s video tour of the beef harvesting process. The video is available on YouTube (http://www.youtube.com/watch?v=VMqYYXswono) and is hosted by Temple Grandin, Ph.D. In the video, Grandin leads audiences through a virtual tour of a beef processing facility from the beginning of the process through to the final product. The second treatment was a photograph and text informational handout derived from the video. To create the handout, the researcher transcribed the audio from the entire video and took screen shots of each of the major concepts portrayed in the video. Subtle changes were made to the text to maintain the overall essence of the information presented. The still photos captured from the video were juxtaposed to the left of the text. The photograph and text treatment was printed in color on standard, letter-sized copier paper. The third treatment was a text only informational handout comprising of text in paragraph form. The audio from the video was transcribed and then subtly altered to maintain the overall essence of the story without any multimedia aids. Any unusual verbal patterns that led to unclear transcripts were removed, and all information was presented from Grandin’s point-of-view through quotes. The text only treatment was printed in black and white on standard, letter-sized copier paper.

A 44-question instrument was created by the researcher, utilizing the Newcomb-Trefz model of learning behavior. All of the information and answers for the created questions were based on the information, which originated in the video treatment. The American Meat Institute’s web-based Glass Walls Project displaying a video of the beef harvesting process was broken down into 11 categories relative to the beef harvesting process: (a) the Glass Walls mission, (b) Temple Grandin as a spokesperson, (c) the benefits of humane animal handling, (d) processes in handling animals humanely, (e) typical cattle behavior, (f) equipment used in processing cattle, (g) animal physiology, (h) harvesting procedures, (i) reasons for humane handling, (j) components of an animal welfare audit, and (k) proper management of a meat processing facility. For each of these categories, a single question was written to each level of cognition including remembering, processing, creating, and evaluating. The decision to limit the measurement of each level of cognition within each of the 11 categories was based on a concern of length expressed by the instrument review panel members that it may result in participant fatigue, lower instrument completion levels, and reduced reliability. Due to the limit of a single question per cognitive level per category, a split-half reliability method was conducted post-hoc using the participant data. A split-half reliability is the
correlation between two scores, referred to as an odd-even reliability. Utilizing a split-half reliability provides a measure of accuracy and provides an estimate of what the correlation would be between two equivalent tests given at the same time (Thorndike, 1997). To analyze the reliability test, the Spearman-Brown coefficient was utilized. The Spearman-Brown Prophecy Formula computes an estimate of reliability from a single administration for a single test, and has the advantage that it does not assume homogeneous content across all items but between two halves and evens out the possibility of an inappropriate split (Thorndike, 1997). The resulting reliability for each cognitive level of questions were: (a) Remembering = .760, (b) Processing = .643, (c) Creating = .842, and (d) Evaluating = .818. To assess content validity, a panel of 10 faculty members and education professionals from across the United States reviewed the instrument for validity. These education professionals were selected for their experience in writing questions to various cognitive levels. From the panel suggestions, several questions were altered to ensure they were asking to the desired cognitive level. Texas Tech University’s Human Research Protection Program approved this research and all communication with participants prior to data collection.

The data collection took place on January 9, 2014 in the Animal and Food Sciences Building on the Texas Tech University campus. Two time slots were designated, 6:00 p.m. and 7:30 p.m., with approximately 110 consumers participating in each time slot. As participants entered the facilities, they were randomly assigned a number for one of the four treatments and were then sent to their specific room for data collection. Immediately prior to the start of the study, participants were informed that their name would in no way traceable to their survey and confidentiality would be maintained. Participants were also informed prior to the start of the study that graphics and information in the treatments could be found disturbing due to the nature of the animal harvesting process and were informed that if they felt uncomfortable at any time, they could leave and still receive the $20 incentive.

One group served as a control group where no participant received a treatment and were asked to complete the questionnaire based on their current knowledge. Three other groups were exposed to one of the following specific treatments including a video, a photograph and text informational handout, or a text only informational handout. Prior to the start of the study, participants were given detailed instructions about the procedures. The video treatment was 10 minutes and 21 seconds long. During the video, participants were allowed to take notes on a blank sheet of paper. At the completion of the video, participants were given five minutes to review their notes. Prior to being asked to complete the instrument, participant notes were collected. The remaining two treatments were given 10 minutes for participants to read and analyze. Throughout the 10 minutes, participants were allowed to write notes on their treatment informational handout. At the completion of the 10 minutes, participants were given five minutes to review their notes and material. Prior to being asked to complete the instrument, participant notes were collected. Total data collection took approximately one hour and a half for each group of consumers. Upon completion of the instrument, participants placed their instrument in a box on their way out of the room. After exiting, participants proceeded back to the registration area where they were paid the $20 incentive by a member of the Department of Animal and Food Sciences, who was not involved in the data collection process.

After data collection, the completed instruments were graded and coded by the researcher. Multiple choice and true/false questions were graded, and short-answer questions were coded
and then graded. Both question methods were then quantified for each treatment and control. The maximum possible score was 61 points (points based on concepts correctly answered for each question). Maximum points for each question were based on the concepts directly correlated with the level of cognition (remembering = 17, processing = 12, creating = 17, evaluating = 15). Data was then entered into and analyzed using SPSS for Windows. A data screening took place where participant data was removed if it was not completed in its entirety. Four participants were initially removed because none of the demographic data was completed. Additionally, a box and whiskers plot was conducted to detect potential outliers (Field, 2009). Upon execution of the boxplot, 14 participants were removed from the data set, leaving the final population for observation at 203 participants. Descriptive data were collected and analyzed with measures of central tendency, variance, and relationships being examined. To examine the null hypotheses, inferential statistics were conducted at $\alpha = 0.05$ a priori.

Results

More than half ($n = 115, 57.8\%$) of the participants in the study were female (Table 2). While age ranged from 18 to older than 60, participants ($n = 203$) were primarily in three age categories including 20 - 29 ($n = 46, 22.9\%$), 40 - 49 ($n = 43, 21.4\%$), and 50 - 59 ($n = 47, 23.4\%$). Participant ethnicity was diverse with Caucasian ethnicity comprising $43.9\%$ ($n = 87$) of participants, followed by Hispanic ($n = 58, 29.3\%$), and African American ($n = 45, 22.6\%$). Income levels ($n = 188$) for participants were dispersed among a wide variety of categories with $51\%$ of participants making more than $50,000, the largest percentage of participants represented incomes more than $100,000 (n = 48, 25.5\%), followed by incomes under $25,000 (n = 37, 19.5\%). More than half of the participants ($62.5\%$) had “some college” ($n = 68, 35.4\%$) or were a college graduate ($n = 52, 27.1\%$). Non-high school graduates represented the minimum in the education level ($n = 11, 5.7\%$).

As for their current involvement in the agriculture industry, most of the participants were agricultural consumers only ($n = 156, 76.8\%$), with only four participants directly involved in agricultural production ($2.0\%$). When participants’ involvement in the agriculture industry and their beliefs toward beef and beef processing was examined, nearly all participants said they eat beef ($n = 186, 96.4\%) but the majority have never participated in the processing of an animal for human consumption ($n = 130, 64.4\%;$ see Table 3). The majority of participants believed that cattle have rights ($n = 145, 73.6\%$) but that cattle should be used for human benefit ($n = 185, 93.0\%$). The majority of each research group thought that beef cattle processing was a positive process with the groups receiving a form of information treatment (text only, photographs and text, or video) expressing higher levels of agreement.

Research objective two sought to investigate which form of message format (video, photographs and text, or text only) pertaining to beef harvesting, is the most effective in reaching higher levels of cognition in consumers. With 61 points possible, the control group scored the lowest with a combined mean of 20.9 ($n = 47, SD = 8.4$) with the video treatment group receiving the highest score ($n = 51, M = 38.2, SD = 12.1$). Table 4 reveals the total mean scores for each treatment group as well as the mean scores for each cognitive level. For testing of the null hypotheses, the remembering and processing cognitive scores were combined for each participant to create a lower cognition score while the creating and evaluating cognitive scores were combined to create a higher cognition score.
Table 2
Participant Gender, Age, and Ethnic Origin, Income and Education by Research Group

<table>
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<tr>
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<th>Two</th>
<th>Three</th>
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<td>%</td>
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</table>

Note. \(^a\) Research groups and treatment received were: Control = no treatment, One = text only treatment, two = photographs and text treatment, and three = video treatment. \(^b\) Participants were not asked to identify what “other” ethnicities they were.
Table 3

Participant Involvement in Agriculture and Opinion Toward Beef Processing by Research Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Research Group</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>One</td>
<td>Two</td>
<td>Three</td>
<td>Overall</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>Do you eat beef? (N = 193)</td>
<td>Yes</td>
<td>43</td>
<td>95.6</td>
<td>44</td>
<td>93.6</td>
<td>49</td>
<td>98.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>2</td>
<td>4.4</td>
<td>3</td>
<td>6.4</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Current involvement in agriculture (N = 199)</td>
<td>Consumer only</td>
<td>37</td>
<td>78.7</td>
<td>42</td>
<td>82.4</td>
<td>37</td>
<td>71.2</td>
</tr>
<tr>
<td></td>
<td>Involved in production ag.</td>
<td>1</td>
<td>2.2</td>
<td>1</td>
<td>2.0</td>
<td>1</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>Grew up on a farm or ranch</td>
<td>3</td>
<td>6.7</td>
<td>4</td>
<td>7.8</td>
<td>11</td>
<td>21.2</td>
</tr>
<tr>
<td></td>
<td>Other b</td>
<td>4</td>
<td>8.5</td>
<td>4</td>
<td>7.8</td>
<td>3</td>
<td>5.8</td>
</tr>
<tr>
<td>Do cattle have rights? (N = 197)</td>
<td>Yes</td>
<td>33</td>
<td>73.3</td>
<td>38</td>
<td>73.1</td>
<td>38</td>
<td>76.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>12</td>
<td>26.7</td>
<td>14</td>
<td>26.9</td>
<td>12</td>
<td>24.0</td>
</tr>
<tr>
<td>Should cattle be used for human benefit? (N = 199)</td>
<td>Yes</td>
<td>41</td>
<td>89.1</td>
<td>46</td>
<td>90.2</td>
<td>50</td>
<td>98.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>5</td>
<td>10.9</td>
<td>5</td>
<td>9.8</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Is beef processing is a positive process? (N = 196)</td>
<td>Yes</td>
<td>40</td>
<td>85.1</td>
<td>44</td>
<td>93.6</td>
<td>50</td>
<td>98.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>7</td>
<td>14.9</td>
<td>3</td>
<td>6.4</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Have you ever participated in processing an animal for human consumption? (N = 202)</td>
<td>Yes</td>
<td>19</td>
<td>40.4</td>
<td>17</td>
<td>33.3</td>
<td>18</td>
<td>34.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>28</td>
<td>59.6</td>
<td>34</td>
<td>66.7</td>
<td>35</td>
<td>66.0</td>
</tr>
</tbody>
</table>

Note. a Research groups and treatment received were: Control = no treatment, One = text only treatment, two = photographs and text treatment, and three = video treatment. b Responses included family involved in the agriculture industry, working on or received a degree in agricultural sciences, former agricultural teacher, former dairy producer. One participant also indicated they raised pigs, hunted hogs and white tail deer.
Table 4
Participants’ Overall and Individual Cognitive Level Score by Research Group

<table>
<thead>
<tr>
<th>Cognitive Level b</th>
<th>Control</th>
<th>Research Group a</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
</tr>
<tr>
<td>Remembering</td>
<td>9.7</td>
<td>3.1</td>
<td>13.6</td>
<td>3.1</td>
<td>13.9</td>
<td>2.9</td>
<td>13.8</td>
</tr>
<tr>
<td>Processing</td>
<td>5.1</td>
<td>2.2</td>
<td>7.6</td>
<td>1.9</td>
<td>8.6</td>
<td>2.3</td>
<td>9.2</td>
</tr>
<tr>
<td>Creating</td>
<td>3.0</td>
<td>2.7</td>
<td>6.5</td>
<td>4.5</td>
<td>7.9</td>
<td>4.1</td>
<td>7.5</td>
</tr>
<tr>
<td>Evaluating</td>
<td>3.0</td>
<td>2.2</td>
<td>6.4</td>
<td>3.2</td>
<td>7.4</td>
<td>3.1</td>
<td>7.6</td>
</tr>
<tr>
<td>Overall</td>
<td>20.9</td>
<td>8.4</td>
<td>34.3</td>
<td>11.0</td>
<td>38.0</td>
<td>11.0</td>
<td>38.2</td>
</tr>
</tbody>
</table>

Note. 

a Research groups and treatment received were: Control = no treatment, One = text only treatment, two = photographs and text treatment, and three = video treatment. 
b Maximum score for each participant was 61. By cognitive level, the maximum score was (a) Remembering = 17, (b) Processing = 12, (c) Creating = 17, and (d) Evaluating = 15.

The null hypothesis (H01) that there is no significant difference between the treatments or control groups on lower-level cognitive test scores was tested using an ANOVA with alpha set at $p = .05$ level. Statistical significance was found ($F (3, 202) = 28.8, p < .01$). Therefore, the null hypothesis of no difference in low cognition between the control group, text only, photographs and text, and video treatment groups was rejected. An effect size was calculated from the ANOVA results (Warner, 2013). A small effect ($f = .09$) was found.

Table 5
Analysis of Variance of Lower-Level Cognitive Scores by Research Group

<table>
<thead>
<tr>
<th>Research Group</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>14.8</td>
<td>4.9</td>
</tr>
<tr>
<td>Text only</td>
<td>21.3</td>
<td>4.6</td>
</tr>
<tr>
<td>Graphics and Text</td>
<td>22.5</td>
<td>4.6</td>
</tr>
<tr>
<td>Video</td>
<td>23.0</td>
<td>5.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source</th>
<th>$SS$</th>
<th>$df$</th>
<th>$MS$</th>
<th>$F$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>2068.7</td>
<td>3</td>
<td>689.5</td>
<td>28.8</td>
<td>&lt; .01*</td>
</tr>
<tr>
<td>Within</td>
<td>4760.7</td>
<td>199</td>
<td>23.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6829.5</td>
<td>202</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *Significant at $p < .05$.

A post-hoc test was utilized to determine the location of the significance. The Levene’s test for equality of variances for low cognition was not significant ($p = .84$). Since the Levene’s statistic was not significant, homogeneity of variances was satisfied. To best control for possible type I error, a Bonferroni post-hoc test was computed to determine the location of significant mean differences. The Bonferroni correction test is the most conservative and is the more powerful post-hoc test when utilizing smaller numbers (Field, 2009). The results revealed that the low-level cognitive scores for three treatment groups were statistically higher than the control group ($p < .05$). No statistical difference was found between the scores of the three treatment groups.
The null hypothesis (H02) that there is no significant difference between the treatments or control group on higher-level cognitive test scores was also tested using an ANOVA with alpha set at \( p < .05 \) level. While a significant difference was found (\( p < .05 \)), the test for homogeneity of variances revealed a significant Levene’s statistic (5.4, \( df_1 = 3, df_2 = 199, p = .001 \)) was detected (Table 6). This indicated a potential heterogeneous group variance. To identify whether this was a heterogeneous situation, an independent-sample t-test was performed in order to validate the Levene’s test (Green, Salkind, & Akey, 2000). Based on the results, the assumption of homogeneity of variances is not satisfied and the null hypothesis of no difference between groups for high cognition is accepted.

Table 6
Independent-Sample t-test Validation of Homogeneity of Variance for High Cognition

<table>
<thead>
<tr>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>CI – 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>( F )</td>
<td>( p )</td>
<td>( t )</td>
</tr>
<tr>
<td>Equal Variances Assumes</td>
<td>13.2</td>
<td>&lt;.01*</td>
</tr>
<tr>
<td>Equal Variances Not Assumed</td>
<td>-5.755</td>
<td>87.8</td>
</tr>
</tbody>
</table>

Note. *Significance detected at \( p < .05 \) level

Conclusions and Recommendations

This study sought to determine which form of information message format (video, graphics and text, or text) pertaining to beef harvesting is the most effective in reaching higher levels of cognition in participants immediately after receiving the treatment. The results of the study found each participant group receiving a treatment realizing a higher cognitive score versus those receiving no treatment.

In testing two null hypotheses to determine if the differences in cognitive score at the lower and higher cognitive levels were caused by the treatment received, statistically significant differences were found at the lower-level of cognition (remembering and processing). A post-hoc analysis indicated significant differences between the control groups and each of the three treatment groups. However, there was not a statistically significant difference between the video treatment, graphic and text treatment, and text treatment groups. This finding indicates that the format used to provide information about beef cattle processing is not as important as the act of receiving information.

While higher cognitive scores were also seen for each of the treatment groups over the control group for the higher-level cognitive areas (creating and evaluating), the assumption of homogeneity of variances was not met during the analysis. Because of this, the second null hypothesis to determine if the differences in cognitive score at the higher cognitive levels were caused by the treatment received was accepted.

This study attempted to focus on the integrating portion of the cognitive theory of multimedia learning and participants’ ability to recall and transfer agricultural information. As achieving
public and policy maker understanding of agriculture is a priority for our profession (Doerfert, 2011), it was important to understand participant involvement in the agriculture industry and attitude toward beef and beef processing. The results of this study are intriguing. The literature review indicated that incorporating multimedia elements, images and video alike, to an informational presentation would increase overall understanding (Bruner, 1966; Mayer, 2002; Mayer, & Moreno, 2003; Mayer, 2005). On average, participants in all four groups scored approximately half of the points possible on the instrument. However, the biggest possible impact on the low scores could be cognitive load. Mayer (2005) indicated that humans could only maintain a few pieces of information in their working memory at any given time. This therefore, causes one to select the most relevant information to process. The information provided in the informational forms could have overstepped participant cognitive load.

The findings in this study are more consistent with the research regarding the picture superiority effect. Researchers regarding the picture superiority effect have found instances inconsistent with the theoretical assumptions and indicated that more research needs to be conducted to validate these results (Amrhein, McDaniel, & Waddill, 2002). A lesser finding did emerge from research null hypothesis one, which is more consistent with prior research that has found that images, either static or animated, will typically increase overall cognition (Bruner, 1966; Mayer, 2002; Mayer, & Moreno, 2003; Mayer, 2005).

It is recommended this study be replicated to determine if the current study’s findings are consistent in the area of beef cattle processing and in other agriculture production processes utilizing larger sample sizes. Additionally, immediate responses should be measured, as well as delayed measures up to three days after treatment exposure to measure retention and transfer of agricultural information. The researcher also recommends measuring the five cognitive processes associated with multimedia learning. These processes include (a) selecting relevant words for processing in the verbal working memory, (b) selecting relevant images for processing in the visual working memory, (c) organizing selected words into a verbal representation, (d) organizing selected images into a coherent pictorial representation, and (c) integrating pictorial and verbal representations with each other and prior knowledge (Mayer, 2005). A better understanding of these processes would prove to be beneficial is assessing achieved cognitive learning and shine a better light on how messages should be created to best foster learning. Finally, it is recommended that cognitive load is further researched in an agricultural literacy context. Mayer (2002) indicates the significance that cognitive load impacts one’s ability to retain all of the information presented at any given time.

References


What Side Are You On? An Examination of the Persuasive Message Factors in Proposition 37 Videos on YouTube

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Courtney Meyers, Texas Tech University
Erica Irlbeck, Texas Tech University
Todd Chambers, Texas Tech University

Abstract

California’s Proposition 37 was a ballot initiative to mandatory label products containing genetically modified organisms (GMOs). Although it eventually failed, it generated immense media exposure regarding GMOs and their possible regulatory, health, and economic impacts. The purpose of this study was to compare persuasive message factors in Proposition 37 videos on YouTube. The researcher used a purposive sample taken from an auto-generated YouTube channel, which resulted in 174 videos. Using content analysis, researchers identified the message side (for, against, or neutral), sources used, message frames, and message appeals. The majority of videos in the sample presented messages in support of the proposition. Citizens were the most common on-camera source. Proponent videos used more emotional appeals, while both videos against and neutral to the proposition incorporated more logical appeals. In addition, the research found three frames were used more by the videos in favor of the proposition than in videos identified as neutral or against. Overall, the results provide insight to how the videos representing for, against, and neutral message sides utilized various sources, frames and message appeals. Recommendations for future research and practice are provided.

Introduction

As agricultural communicators, there is a need to recognize the escalating consumer demand for information regarding the industry’s practices and products. When making food choices, Americans are considering more factors than just taste and cost. Now they are looking for information about where the food comes from and how it was produced (International Food Information Council, 2011). Catering to these needs, media outlets have increased their coverage of modern food production issues, including food technology (International Food Information Council, 2012). With the general consumers’ limited understanding of the production process, specifically genetically modified (or genetically engineered) food and crops, it is to be expected that they will be hesitant and question the safety of the process (McHughen, 2013). The public’s concern regarding the legitimacy and moral authority of information about genetically modified food has generated the need for new scientific communication methods (Augoustinos, Crabb, & Shepher, 2010).

Even after decades of existence, skepticism surrounds the term “genetically modified organisms” (GMOs), which fuels an intense debate in agriculture (Azadi & Ho, 2010). First developed in the 1980s for medicinal products (Azadi & Ho, 2010), there are now four consumable GM crops being produced: soybeans, corn, canola, and sugar beets (Chrispeels, 2014). GMOs are a common ingredient in 70% of packaged, bottled, or frozen items in American grocery stores (Chrispeels, 2014). In 2012, the dispute regarding GMOs became a mainstream concern in the United States, specifically regarding labeling requirements for products containing GMOs.
According to Premanandh (2010), the purpose of labeling is to help consumers have a choice when selecting food products, by providing content information. Chrispeels (2014) stressed that labeling is meant to be neutral. However, Angoustinos et al. (2010) reported the debate of labeling genetically modified organisms is not just about science – it is social, moral, and political.

Proposition 37, a ballot initiative in California was described as the “first major policy attempt to transition from voluntary to mandatory labeling of GE foods in the United States” (McFadden & Lusk, 2013, p. 174). Contrary to the poll results leading up to the election, the proposition failed. McFadden and Lusk (2013) said “support for [Proposition] 37 repeatedly polled around 70% until less than a month before the election” (p. 175). After tabulation, it was narrowly defeated with 51.5% opposing the proposition and 48.5% in favor of mandatory labeling (Zilberman et al., 2013). McFadden and Lusk (2013) claimed the failure might be largely due to campaign advertisements. Although the proposition failed, it served as catalyst for activists in other states to organize a fight for labeling using social media platforms (Plagakis, 2013). In 2013, 26 states introduced bills to label genetically modified foods (Center for Food Safety, 2014). Some surveys indicated more than 90% of Americans are in favor of labeling products containing GMOs (Kopicki, 2013; Langer, 2013). Therefore, monitoring the initiatives is not only important, but necessary because the discourse could be an indication of public opinion about the genetically modified foods.

People have progressively moved toward online media as their source for media consumption (Yoo & Kim, 2012). Particularly, YouTube has surpassed cable networks in reaching 18 to 34 year olds (Glenn, 2013). YouTube was one channel used to inform consumers about Proposition 37. Its ability to reach a wide audience can serve as an influential tool in shaping individual preferences (Susarla et al., 2012), and it is important to recognize not only who is using it, but how it is being used. Currently, it is the second largest search engine (YouTube, 2013). One hundred hours of video are uploaded to YouTube per minute and 60% of people on social media use YouTube as a social networking tool (Meeker & Wu, 2013). So individuals are not only watching videos, they are also sharing, liking, and commenting on videos creating a transformation in consumer engagement (Susarla, Oh, & Tan, 2012). This social aspect, along with effortless usability is driving its success (Cheng, Liu, & Dale, 2008; 2013).

With user-generated content and the swift dissemination of information, it is important to monitor the content related to agriculture available through this source. Goodwin and Rhoades (2011) looked at the presence of California Proposition 2 on YouTube. Proposition 2 was a ballot initiative that passed that “outlawed the use of battery cages for laying hens, gestation crates for sows, and veal crates for veal calves by 2015” (Goodwin & Rhoades, 2011, p. 22). The study determined what message appeals were used to increase viewers’ support for the legislation and found emotional appeals were used in a majority of the videos. They encouraged others to replicate the study with other issues posted on YouTube and extend the research to other social networking sites (Goodwin & Rhoades, 2011). In addition, Rhoades and Ellis (2010) studied how food safety was framed on YouTube videos and found several authors were posting multiple videos, concluding that “establishing a presence and publishing multiple videos can help the reach of a communication campaign and establish your credibility with the social network found on YouTube” (Rhoades & Ellis, 2010, p. 172).
Professionals and traditional communicators need to not only be aware of messages that could counter their communications efforts (Christensen, 2007), but monitor what videos are posted relating to their given area of understanding. The controversy of genetically modified food could potentially have a negative impact on agricultural production, thus stressing the importance of determining how GMOs are portrayed on new media outlets, such as YouTube. For example, mandatory labeling will impose additional costs to regulate proper testing and labeling procedures (Legislative Analyst’s Office, 2012). Additionally, although intended to provide objective information, due to negative coverage, these GM labels could be considered warning signs (Chrispeels, 2014), decreasing demand for GM products. In 2013, more than 90% of corn, cotton and soy producers used GM varieties (USDA, 2013). The decreased demand in GM products would greatly impact those producers. Moreover, GMO policy regulation would complicate further development of technologies (Premanandh, 2010). Agricultural communicators have realized the opportunity emerging technologies have over mainstream communication channels and are using sites like YouTube to provide a unique messaging channel (Rhoades & Ellis, 2010).

**Literature Review/Theoretical Framework**

YouTube has experienced immense growth due to its “usability and functionality” (Susarla et al., 2012, p. 23). Since its development in 2005, YouTube has become a popular platform for Internet users, businesses, advocacy groups, and even political parties as a free service to upload and share videos (Church, 2010; Paek, Kim & Hove, 2010). Different than watching television and film, people watch YouTube when they have little time (Kavoori, 2011), making it essential to have effective and interesting videos. Kavoori stated “if the video is poor, the sound is bad, and the context is problematic, it is time to play something else” (p. 8). As seen in the Obama 2008 campaign, YouTube can bring politics to the digital realm (Kavoori, 2011).

With activist groups and scientists supplying information on the negative effects of GMOs (Du & Rachul, 2012), advocates need to address how to effectively combat these messages by providing additional information on the positive impacts of agricultural biotechnology. McHughen (2013) stated, “scientific experts need to share their knowledge to enable a more informed populace and a healthier society” (p. 10). However, this is not an easy task. The constant access and exposure to persuasive communication efforts have made consumers cautious of what is truthful (Perloff, 2010). Therefore, it is important to research what persuasive tactics are most effective.

The theoretical framework for this study draws upon the Elaboration Likelihood Model, framing, and message appeals. The Elaboration Likelihood Model (Petty & Cacioppo, 1986) provides a framework to explain the basic processes underlying persuasive communication. The theory states that attitudes can be formed through two routes to persuasion, the central route and the peripheral route (Petty, Cacioppo, Strathman, & Priester, 2005). The central route is for individuals who have a high degree of elaboration when processing a message. Petty and Cacioppo (1986) defined elaboration as “the extent to which a person thinks about the issue-relevant arguments contained in a message” (p. 128). In order for individuals to generate issue-relevant cognitive responses to a message, or centrally process a message, they have to be motivated and able to process the message (Petty et al., 2005). If motivation is not present or ability is impaired, individuals will rely on simple cues and will not scrutinize the quality of the
message (Petty & Cacioppo, 1986). Harington et al. (2006) described the peripheral route to persuasion process when “individuals rely upon affective states or simple heuristics to generate conclusions” (p. 145). Message length and source characteristics are examples of simple cues used in peripheral processing (Petty et al., 2005). For example, Metzger and Flanagan (2013) stated “people are likely to believe a source whose name they recognize as more credible compared to an unfamiliar source, with little inspection of the actual content” (p. 214). Attitudes formed by peripheral processing are less accessible and resistant than attitudes formed during central route processing (Harington et al., 2006). This theory is important to apply to videos, as it provides a framework for both visual elements and message content.

Another theory focusing on message persuasion is Goffman’s (1974) theory of framing. Framing is used to describe how mass media present information by selecting or ignoring particular aspects of an issue (Stone, Singletary, & Richmond, 1999). McCombs, Shaw, and Weaver (1997) said framing is linked to how an audience interprets the information based on salience of particular aspects of the information. Framing is determined by an individual’s set of expectations; using them to create understanding in a given social situation (Baldwin, Perry & Moffitt, 2004). This definition is consistent with Goffman’s (1974) explanation that individuals use previous experiences to process information. Traditionally in communication research, framing studies have examined news coverage, but the same process can be used when individuals view videos for information. Regarding GMOs, Abbot et al. (2001) found the media used frames such as human health, environmental, regulatory, business, and morality. Rhoades and Ellis (2010) stated that it is important to understand the frames used in videos because they can influence an audiences’ perception of a given topic depending on how the information is presented.

In addition to theory, particular message characteristics, such as appeals, can influence the persuasive ability of messages (English, Sweetser, & Ancu, 2011). Muller (1986) defined message appeals as the designing of messages to motivate consumer purchases. The two message appeals most often used are logical or emotional (Goodwin & Rhoades, 2011). Logical appeals, or logos, provide factual information allowing the audience to evaluate and decide if the information is valid (English et al., 2011). Stemming from information processing models of decision making, logical appeals rely on factual arguments about a given topic assuming the consumer bases behavior on rationale (Albers-Miller & Stafford, 1999; Goodwin & Rhoades, 2011). English et al. (2011) said logical appeals rely on source credibility and statistics.

Emotional appeals are used to motivate consumer behavior by arousing positive or negative emotions about a given product (Kotler & Armstrong, 2010). They deal more with affective processing and generate consumer feelings to persuade behavior (Albers-Miller & Stafford, 1999). Types of emotional appeals can be categorized by those specific emotions such as fear, humor, and social appeals. English et al. (2011) examined political communications and the use of message appeals. Their results indicated humor appeals impacted how the viewers assessed the credibility of the message. They concluded “the information is not seen as credible as that coming from an expert or from a fact-based argument” (p. 744).
Purpose and Research Questions

Part of the American Association for Agricultural Education’s 2011-2015 National Research Agenda (Doerfert, 2011) is to help the public and policy makers understand agriculture and natural resources by recognizing the potential of emerging social media and messaging strategies. It is vital for agricultural communicators to understand the platforms consumers use to seek information about their food supply, and how agricultural issues are represented on these highly accepted media. The purpose of this study was to compare persuasive message factors in Proposition 37 videos on YouTube among the different message sides of the debate (for, against, and neutral). The research addressed the type of sources used in YouTube videos, how Proposition 37 videos are framed, and the message appeals used to convey information about labeling GM products. This purpose allows the researcher to establish a fundamental understanding of Proposition 37 messages and how it is used to persuade the YouTube community. To accomplish this purpose, the following research questions guided the study:

RQ1: For each of the message sides, what sources are used in YouTube videos about Proposition 37?

RQ2: For each of the message sides, what message appeals exist in YouTube videos about Proposition 37?

RQ3: For each of the message sides, what message frames exist in YouTube videos about Proposition 37?

Methodology

This research used quantitative content analysis to evaluate YouTube videos about Proposition 37 in California. Content analysis is “a method of studying and analyzing communication in a systematic, objective, and quantitative manner for the purpose of measuring variables” (Wimmer & Dominick, 2003, p. 141). Using content analysis can provide new insights, increased understanding of a particular phenomena, or practical actions (Krippendorff, 2012). Content analysis can be conducted using either a qualitative or quantitative design. If the researcher establishes variables a priori and is able to use the variables to draw conclusions, the design is quantitative (Ary et al., 2006).

On November 11, 2013, the search term “California Proposition 37” on YouTube yielded about 33,500 individual video results (YouTube, 2013). Therefore, the researcher decided to study a particular YouTube channel. Using the same search term in the main search bar and applying a filter to only display results that were channels, the population was chosen. Collected in mid-November 2013, the lead researcher utilized an auto-generated channel, established by YouTube, making the population of the study 287 videos. An auto-generated channel is created using an algorithm to collect videos on prevalent topics (YouTube, 2013). A purposive sample was taken from the population, which resulted in 174 videos. The sample was chosen based on the average video length of YouTube videos, which was approximately four minutes (Pew Research Journalism Project, 2012). Cheng et al. (2013) also found medium-length (2 minutes and 52 seconds to 4 minutes) videos were more popular than longer videos. Therefore, the researcher omitted any videos longer than four minutes. In addition, 12 videos were eliminated including
one duplicate video, one video not relevant to the research, four videos unavailable at the time of data collection, and six radio advertisements. The useable sample consisted of 162 videos ranging from 15 seconds to four minutes.

To analyze the sample, a code book was developed based on adapted material from previous literature (Abbot et al., 2001; Abrams & Meyers, 2009; Paek et al., 2010). This code book allowed coders to determine the message side, sources, frames, and appeals used to portray GMO labeling in Proposition 37 videos on YouTube. Through the coder training and pilot test phases, it was revised to clarify any indistinct descriptions.

To ensure accuracy and meet intercoder reliability, which is needed in content analysis studies, coders were trained and a pilot test was conducted. Intercoder agreement is “a measure of the extent to which independent judges make the same coding decisions in evaluating the characteristics of messages” (Lombard, Snyder-Duch, & Bracken, 2002, p. 587). Following the coder training guidelines set by Lombard et al. (2002), three coders independently analyzed 10 videos, separate from the research sample. All disagreements and concerns were addressed and the code book was altered to clarify any unclear descriptions. Once the lead researcher determined coders were adequately trained, they proceeded to assess intercoder reliability by conducting a pilot test. Thirty videos were randomly selected from the sample to test reliability. Following De Swert’s (2012) advice, Krippendorff’s alpha was used to calculate intercoder reliability. Of the 37 variables, 16 variables met the reliability of .70 or higher, which is acceptable for Krippendorff’s alpha and exploratory research (Lombard et al., 2002). The variables that did not meet the set reliability standard were evaluated and clarified with the coders. A second reliability test was conducted and reliability of .70 was met on all variables. These reliabilities were recorded to verify the consistency between coders. The coders then divided the remaining 132 videos evenly and proceeded to collect data over a three-day period. The data for each video were recorded on the code book, and later entered into a single Microsoft Excel document.

The final codebook was established after all training and the pilot reliability test. Each video could be coded for one of three message sides (for, against, or neutral). If the video presented messages that clearly expressed a desire for the proposition to pass, it was coded as the “for” message side. Conversely, if the video contained messages stating the proposition should not pass, it was coded as the “against” message side. If the video showed both positive and negative aspects of the proposition, the coder selected the “neutral” message side.

Additionally, coders could select multiple on-camera sources: citizens, celebrities, scientists, farmers, doctors, industry, non-governmental organizations, governmental organizations, and other. If “other” was selected, the coder recorded a description of the source (or lack thereof). The code book also included seven predetermined frames: human health, environmental, regulatory, business, morality/ethics, right to know, and other (Abbot et al., 2001). These were chosen based on prior GM media coverage, except for the right to know frame. This frame was added after training due to its prevalence in the coder training videos. In addition, the morality/ethics frame was originally just morality, but was extended to include ethics to clarify coder understanding. Depending on the information provided in the videos, coders could select multiple frames per video. Lastly, the code book guided coders to select if the video used logical
appeals, emotional appeals, or both. This is another area in the codebook that need additional clarification in its description after coder training and the pilot test.

Once coding was complete, the lead researcher formally evaluated reliability using 10% of the full sample (n = 17). The sample was randomly selected, excluding the pilot test subsample. Reliability was calculated using Krippendorff’s alpha with the online ReCal program. All variables met the acceptable reliability standard for the measurement and type of research, which was .70 or higher (Lombard et al., 2002). To describe the sample of Proposition 37 YouTube videos, the researcher calculated frequencies and percentages. Cross tabulations were analyzed to explore and compare the persuasive message factors with the message side.

Results

Out of 162 videos sampled, 116 (71.6%) were in support of the proposition, 26 (16.1%) were against, and 20 (12.3%) were neutral to passing mandatory labeling of GM products. The creator most frequently recorded was the category labeled user-generated, or individual creator (n = 67, 41.4%), followed by the undefined (other) creator (n = 41, 25.3%). The final two video creators identified were media (n = 28, 17.3%) and non-governmental organizations (n = 26, 16.0%). The video length was recorded with a minimum length of 15 seconds and a maximum length of 4 minutes. The average video length of the sample was one minute and 40 seconds (SD = 1.00). All videos were uploaded to YouTube between July 1, 2012, and November 1, 2013. The majority of the videos were uploaded October 2012, the month prior to the election (n = 92, 56.8%).

RQ1: For each of the message sides, what sources are used in YouTube videos about Proposition 37?

The sources present on camera were identified and the “other” category was the most prominent with 44.4% (n = 72) of the videos not fitting a predetermined category. All the “other” sources were then categorized and Table 1 displays the frequency and percentage of each source. Coders identified actors as individuals acting out a role in the video, whereas a celebrity was identified as a famous person.
Table 1

| Types of On-camera Sources Used in YouTube Videos About Proposition 37 (N=162) |
|---------------------------------------------|----------|----------|
| Type of Source                          | Frequency | Percent (%) |
| Citizens                                 | 48        | 29.6     |
| No Sources                                | 27        | 16.7     |
| Celebrity                                 | 20        | 12.5     |
| Actors                                    | 16        | 9.9      |
| Scientists                                | 16        | 9.9      |
| Farmers                                   | 15        | 9.3      |
| Doctors                                   | 10        | 6.2      |
| Reporters                                 | 7         | 4.3      |
| Pam Larry “initial instigator of Proposition 37” | 6         | 3.7      |
| Industry                                  | 4         | 2.5      |
| Non-Governmental                          | 4         | 2.5      |
| Public Officials                          | 3         | 1.9      |
| Radio Hosts                               | 4         | 2.5      |
| Chefs                                     | 3         | 1.9      |
| Campaign Representatives                  | 3         | 1.9      |
| Characters                                | 3         | 1.9      |
| Governmental                              | 2         | 1.2      |
| Not Specified                             | 2         | 1.2      |
| Veteran                                   | 1         | 0.6      |

Note. Coders could select multiple sources; percentages do not equal 100%

A crosstab was conducted to determine the frequency of sources used compared by the message side (for, neutral, and against). Citizens (n = 34), no sources (n = 21), and celebrities (n = 20) were utilized most by videos for the proposition. The videos against the proposition integrated scientists (n = 8) more frequently than any other on-camera source. Similar to proponent videos, neutral videos most frequently incorporated citizens (n = 10) as on-camera sources. Table 2 provides the frequencies of on-camera sources by message side.
Table 2  
*Crosstab of On-Camera Sources by Message Side*

<table>
<thead>
<tr>
<th>Type of Source</th>
<th>For</th>
<th>Against</th>
<th>Neutral</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citizens</td>
<td>34</td>
<td>4</td>
<td>10</td>
<td>48</td>
</tr>
<tr>
<td>No Sources</td>
<td>21</td>
<td>4</td>
<td>2</td>
<td>27</td>
</tr>
<tr>
<td>Celebrity</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Actors</td>
<td>11</td>
<td>4</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Scientists</td>
<td>3</td>
<td>8</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>Farmers</td>
<td>9</td>
<td>3</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Doctors</td>
<td>7</td>
<td>3</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Reporters</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Pam Larry “initial instigator of Proposition 37”</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Industry</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Non-Governmental</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Public Officials</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Radio Hosts</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Chefs</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Campaign Representatives</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Characters</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Governmental</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Not Specified</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Veteran</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>132</td>
<td>29</td>
<td>32</td>
<td>193</td>
</tr>
</tbody>
</table>

**RQ2: For each of the message sides, what message appeals exist in YouTube videos about Proposition 37?**

The message appeals used in the sample were identified as emotional or logical. Of the 162 videos, 140 videos (86.4%) used an emotional appeal and 112 videos (69.1%) used a logical appeal. A majority of videos used both types of appeals (n = 93, 57.4%). The contingency table (Table 3) presents the frequencies of message appeals used according to the message side. The videos for the proposition tended to integrate more emotional appeals (n = 110) than the messages against (n = 17) or neutral to the proposition (n = 19). Messages against and neutral to the proposition used more logical appeals than emotional appeals.
**Table 3**

*Crosstab of Message Appeals by Message Side*

<table>
<thead>
<tr>
<th>Message Side</th>
<th>For</th>
<th>Against</th>
<th>Neutral</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical</td>
<td>71</td>
<td>22</td>
<td>19</td>
<td>112</td>
</tr>
<tr>
<td>Emotional</td>
<td>110</td>
<td>17</td>
<td>13</td>
<td>140</td>
</tr>
<tr>
<td>Total</td>
<td>181</td>
<td>39</td>
<td>32</td>
<td>252</td>
</tr>
</tbody>
</table>

**RQ3: For each of the message sides, what message frames exist in YouTube videos about Proposition 37?**

The seven frames provided in the code book were human health, environmental, regulatory, business, morality/ethics, right to know, and other. The most frequently used frame in the sample was the right to know (n = 97, 59.9%), followed by human health (n = 83, 51.2%). The regulatory frame was used in 44.4% of the videos (n = 72), while the morality/ethics frame was used in 42% of the sample (n = 68).

To illustrate which message frames were incorporated by each side of the proposition, a crosstab was conducted. The side in favor of the proposition used the right to know (n = 84), morality/ethics (n = 61), and the human health (n = 61) frames more frequently than other frames. In videos against the proposition, the regulatory frame was most commonly incorporated frame (n = 17). The neutral videos primarily utilized the regulatory (n = 16) and the human health (n = 15) frame. Table 4 presents the frequencies of messages frame depending on the message side.

**Table 4**

*Crosstab of Message Frames by Message Side*

<table>
<thead>
<tr>
<th>Message Frame</th>
<th>For</th>
<th>Against</th>
<th>Neutral</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Health</td>
<td>61</td>
<td>7</td>
<td>15</td>
<td>83</td>
</tr>
<tr>
<td>Environmental</td>
<td>14</td>
<td>2</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Regulatory</td>
<td>39</td>
<td>17</td>
<td>16</td>
<td>72</td>
</tr>
<tr>
<td>Business</td>
<td>22</td>
<td>9</td>
<td>9</td>
<td>40</td>
</tr>
<tr>
<td>Morality/Ethics</td>
<td>61</td>
<td>6</td>
<td>1</td>
<td>68</td>
</tr>
<tr>
<td>Right to Know</td>
<td>84</td>
<td>3</td>
<td>10</td>
<td>97</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>1</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>289</td>
<td>45</td>
<td>61</td>
<td>395</td>
</tr>
</tbody>
</table>

**Conclusions, Discussion and Recommendations**

As consumers’ interests in agricultural practices increase, the importance of effective communication is reinforced. According to Doerfert (2011), one way to support public understanding is through the development of message strategies on emerging social media outlets. By analyzing message sides, on-camera sources, frames and message appeals the research was able to compare the persuasive message factors in Proposition 37 videos on YouTube.

In order to describe the presence of Proposition 37 YouTube videos, data were collected using a researcher-developed code book. First, the sample was described by identifying if the videos supported, opposed, or were neutral to the proposition. Out of the 162 videos, 116 (71.6%)
supported the proposition and wanted mandatory labeling of GM products to pass. This is consistent with polls leading up to the election indicating a majority of the public wanted the proposition to pass (McFadden & Lusk, 2013). The remaining videos were split fairly close with 26 (16.0%) against the proposition, and 20 (12.3%) neutral to the proposition.

Research Question One sought to identify the sources used in YouTube videos about Proposition 37. Examples of the “other” on-camera sources included no sources, actors, reporters, Pam Larry (the “initial instigator” of Proposition 37), radio hosts, chefs, campaign representatives, characters, and a veteran. Citizens were the most common (n = 48, 29.6%) source. This aligns with the nature of YouTube. As mentioned previously, user-generated content was the most common creator. Given this finding, it can be concluded that the most accessible source would be peers, rather than experts in the field, doctors, or celebrities. Videos against the proposition used scientists as their primary on-camera source. According to Elaboration Likelihood Model, this could be beneficial if the viewers are using peripheral cues to process the message. Since a scientist is typically seen as credible, viewers relying on simple cues would assume the information is also truthful. English et al. (2011) stated expert sources are influential in changing an audience’s attitude and behavior. However, as mentioned by Perloff (2010) and Augoustinos et al. (2010), consumers are wary of the scientific information.

Research Question Two sought to determine what message appeals exist in YouTube videos about Proposition 37. Emotional appeals (n = 140, 86.4%) were used more frequently in the sample than logical appeals (n = 112, 69.1%). This is consistent with Goodwin and Rhoades’ (2011) finding that emotional appeals were used more frequently in YouTube videos about Proposition 2, another ballot initiative in California. In addition, the videos for the proposition used more emotional appeal than logical appeals, while both videos against and neutral to the proposition had more logical appeals. This finding is not surprising because those against the proposition and those neutral to the proposition utilized statistics and objective statements, rather than statements that could provoke emotions. However, in this research, a majority of videos used both types of appeals, typically providing rational and subjective statements to persuade viewers to vote for or against Proposition 37.

Research Question Three sought to determine what message frames exist in YouTube videos about Proposition 37. As Rhoades and Ellis (2010) stated, understanding how frames are used in videos is important because these frames can impact how audience members perceive a certain topic. Right to know and human health were the most prominent frames in the sample, present in majority of the videos. By identifying how GMO labeling was framed on YouTube, agricultural communicators can better address the questions and concerns consumers face. This is related to the concept that framing makes some information more salient and can influence how the audience understands the information (McCombs et al., 1997).

The right to know frame deserves recognition, as it was not originally incorporated into the code book. After conducting a pilot test, the researcher noticed its frequency in the sample, and included it for the final coding procedure. While earlier studies identified many frames used by newspapers and mass media outlets to convey GMO issues (Abbot et al., 2001; Lore et al., 2013), they did not recognize the right to know frame. However, in this sample it was the most prominent (n = 97, 59.9%). It is a unique finding because it addresses a more emotionally-driven, standalone concept of human rights, whereas the other frames can be supported by facts.
This could possibly pose a significant obstacle for the agricultural industry because those in the industry tend to rely on fact to help communicate the processes and products they developed. This frame indicates it may be important to consider other communication approaches, or type of messages to reach non-agricultural audiences.

The second most common frame was human health (n = 83, 51.2%). The human health frame was used to communicate health risk, as well as to reassure the safety of genetically modified products. When videos cited negative human health effects and provided a source, the most noted was a French study (Seralini et al., 2012) that indicated genetically modified corn produced tumors in rats. Since the release of that study, it has faced numerous criticisms and has been removed from the journal it was published in (Chrispeels, 2014); however, the impact still prevails in this sample of YouTube videos. With the majority of the videos using a human health frame, it implies that the safety of genetically modified organisms is still a concern.

Another important finding was the presence of the morality/ethics frame (n = 68, 42%). Although this frame was found in other studies, in this sample it was incorporated much more frequently (Abbot et al., 2001; Lore et al., 2013). This was interesting because this frame focused more on ethical and moral standards such as business transparency and honesty, rather than the negative or positive effects of labeling genetically modified organisms. Augoustinos et al. (2010) recognized the need for new communication tools when science is challenged by social, moral and political standards.

It is important to note that the three prominent frames were used more by the videos in favor of the proposition than those coded as neutral or against. Neutral videos utilized the regulatory and human health frame most frequently, and the videos opposing the proposition predominantly used the regulatory frame. These findings support and explain why videos for the proposition, as well as the overall sample, had more emotional appeals present. All three of these frames can easily incite emotional responses. Additionally, the results provide topics for agricultural communicators to consider when developing opposing messages on GMO labeling.

This study provides several recommendations for future research. One limitation of this study is the sample size. It is possible videos that better represent the Proposition 37 on YouTube were missed using the user-generated channel. Future research should take a random sample of videos to help obtain an accurate representation of all Proposition 37 YouTube videos. In addition, many of the identified sources were not originally included in the code book (n = 72, 44.4%). This could be because the nature of YouTube does not follow the typical gatekeeping processes, allowing for other sources to be used that may not have met more rigorous standards in traditional media outlets. Moreover, research should be conducted to address the moral/ethical frame more extensively. Exploring why consumers are concerned with business transparency and honesty can provide ways to build a better relationship with consumers. Future research should examine, through qualitative or experimental methods, which source is most favorable among viewers when supplying scientific information to the public on social media platforms.

The findings of this study have a few important implications for future practice. First, it is obvious YouTube has numerous videos about agricultural issues – the keywords for this Proposition 37 alone returned more than 33,000 results. Therefore, there is a definite need for practitioners to use YouTube as a communications outlet. Although YouTube alone cannot
change poll results, practitioners still need to be aware of its content when developing messages. It provides insight on public opinion, an outlet to reach a younger audience, and an additional channel to supply information.

In addition, the findings associated with message frames used in the sample highlight an important issue. The most prominent frame in the sample was the right to know. This finding has important implications for developing campaigns against mandatory labeling because it is not a fact-based argument. Agricultural communicators need to be aware of these types of arguments to sufficiently approach and overcome such opposition.

References


Chrispeels, M. J. (2014). Yes indeed, most Americans do eat GMOs every day! *Journal of Integrative Plant Biology, 56*(1), 4-6.


Exploring the Uses and Gratifications of Agricultural Blog Readers

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Erica Irlbeck, Texas Tech University
Cindy Akers, Texas Tech University

Abstract

Blogs are a type of social media that present a unique opportunity to provide information to a large audience without the constraints of traditional media’s gatekeeping barriers. Within agriculture, several studies have examined agricultural blogs, but not from the perspective of blog readers. Therefore, the purpose of this study was to describe the uses and gratifications of agricultural blog readers. This study used a descriptive survey research design and online questionnaire to assess agricultural blog readers’ demographics, Internet and blog use, attitudes toward agriculture, and motivations for reading blogs. Findings indicated that most respondents had direct experience in agriculture and were supportive of the industry. The strongest motivations for accessing agricultural blogs were to find out what other people think about important issues or events and to find alternatives not covered by traditional news sources. Blogs proved to be a useful source of information, but more should be done to expand reach beyond those in the industry. Additional research is needed to more fully describe agricultural blog readers’ uses and gratifications. This research was funded in part by USDA’s Beginning Farmers & Ranchers Development Program.

Introduction

Social media has become an important part of how people communicate. Because of this, social media can heavily impact how, why and where people choose to find their information (Dunne, Lawlor, & Rowley, 2010). The majority of adults who utilize the Internet use some sort of social networking site, and of those adults, 42% use more than one social networking site (Duggan & Smith, 2013). Those social networking sites include Facebook, LinkedIn, Pinterest, Twitter, and Instagram.

Blogs are another form of social media, and approximately 329 million Americans view blogs monthly (Rampton, 2012). Blogs are a form of interactive social media that allow a host “blogger” to post individualized information, links, photos, and videos, which other users may reply to through a variety of forms (Kaye, 2010). In 2012, there were at least 42 million existing blogs with 500,000 new posts per day (Rampton, 2012). Blogs provide a unique opportunity to “alleviate some of the concerns that come with traditional marketing” (Singh, Vernon-Jackson, & Cullinane, 2008). Blogs can increase cognizance and consumer loyalty through engagement of the consumer in the development of expectations and experiences. By opening the door to personal communication, blogs help foster an honest and trustworthy environment for consumers to easily participate (Singh et al., 2008; Anderson-Wilk, 2009).

Kaye (2010) indicated that blogs are becoming an increasingly more popular way to communicate information because users prefer the interactivity of blogs. Blogs have given people the power to share a lot of information instantly and allow others to respond and
contribute to the topic (Kaye, 2010). According to Smith (2008), blogs give consumers an outlet to exercise a legitimate online voice to share their opinion without having to go through traditional media channels such as television, newspapers, magazines, or radio shows. Blogs can provide a large amount of information for audience members, encourage interaction through comment features, and allow syndication of content to make the blog posts more accessible (Kabani, 2013).

Previous research on blogs has explored how blogs could be used in education (Kim, 2008); public relations practitioners’ use of blogs (Porter, Sweetser, & Chung, 2009); how blog credibility affects how consumers select blogs (Kaye & Johnson, 2011); and the influence of blog readers’ demographics on expectations (Kim & Johnson, 2012). These studies are only a few of the many empirical investigations into the use of blogs for personal, educational, organizational, and professional purposes.

As the availability and prevalence of social media tools has increased, so too have empirical studies to investigate how these tools are being utilized in agriculture. In an examination of how agriculturists used Facebook to promote agricultural advocacy efforts, Meyers, Irlbeck, Graybill-Leonard, and Doerfert (2011) found that these individuals believed their efforts would not be possible without the use of social media. The in-depth interviews with administrators of Facebook groups revealed that this form of communication was effective in encouraging conversation and building relationships.

Doerfert, Graber, Meyers, and Irlbeck (2012) conducted a study about what traditional and nontraditional media channels Texas agricultural producers used. The findings indicated that while agriculturists predominantly used traditional media (such as magazines and radio), Internet use is increasing for finding agricultural information, particularly related to commodity markets. Overall, the respondents indicated very little use of social media to find information related to agricultural production (Doerfert et al., 2012).

A qualitative study of agriculturists’ use of social media for agri-marketing revealed that participants were positive about using social media to communicate about their own agricultural operations and as the industry as a whole (White, Meyers, Doerfert, & Irlbeck, 2014). These participants started using social media because they wanted to combat negative or incorrect information about agriculture (White et al., 2014). In a study of agriculturists in three states, Shaw (2013) found that Facebook was the only social media tool used frequently for both personal and business use. Other social media tools such as Twitter, blogs, and photo sharing sites were used less frequently, and the majority of respondents did not use these sites at all for personal or business use.

Within agricultural communications, several researchers have studied blogs. Fannin and Chenault (2004) explored how blogs could disseminate agricultural information to journalists and non-media consumers. In a content analysis of agriculture-focused blog content, Rhoades and Hall (2007) analyzed the characteristics of blogs in agriculture and what information the blogs contained. They found that although agricultural blogs were a new communications tool, they did address a variety of industry-relevant topics. Rhoades and Aue (2010) surveyed agricultural editors and broadcasters to determine their use of Web 2.0 and social media technologies. These agricultural communicators understood the need to adopt new technology,
but had difficulty maintaining blogs with pertinent information (Rhoades & Aue, 2010). Moore, Meyers, Irlbeck, and Burris (2013) investigated U.S. agricultural commodity organizations’ utilization of blogs to reach their target audience. The results indicated that agricultural communicators found value in using blogs to reach audience members, but said this communication outlet required constant attention to successfully develop relationships (Moore et al., 2013).

How agriculture media portrays important and relevant issues is becoming increasingly important because of the increased use of social media (Rhoades & Aue, 2010). As social media tools, such as blogs, become more popular outlets for agricultural news and information, there is a need to discover what motivates readers to access certain agricultural blogs over others. Although there has been research conducted about how agricultural commodity organizations use blogs to reach and communicate with readers (Moore et al., 2013); there is a lack of information about how and why readers access agricultural blogs. It is important for the agriculture industry to have knowledge about blog readers in order to meet the audience members’ expectations and information needs.

Theoretical Framework

The theoretical framework in this study draws upon the theory of uses and gratifications. The uses and gratifications approach attempts to understand and analyze the way people communicate to satisfy their own needs and expectations (Katz, Blumler, & Gurevitch, 1973). This theory contains several assumptions. First, the researcher must assume the person involved has some level of internal coherence and can understand the questions being asked. Each person must be perceived as active and unique; therefore, researchers should not assume all people are the same and have the same expectations. Another assumption is that media sources are constantly competing with each other and researchers should not neglect older forms of needs fulfillment (Katz et al., 1973).

Media researchers should focus on the users’ needs in order to more effectively evaluate how well media meet users’ gratification criteria (Katz et al., 1973). A combination of features helps readers determine which media source is more or less qualified or credible to fulfill their particular needs or expectations. By studying peoples’ uses and gratifications for accessing certain forms of mass media, communication professionals can potentially better target and serve their audience in the future (Katz et al., 1973).

Although uses and gratifications theory was established more than 30 years ago, it has had recent resurgence with more studies examining Internet and social media use (Urista, Dong, & Day, 2008; McQuail, 2005). Rubin (2009) stated that newer online media “are continually altering how people, organizations, and societies function” (p. 155) and adopting a uses and gratifications perspective will help better understand relationships between people and communication technologies. Drawing upon past uses and gratifications research, different channels and content of media have been found to fulfill different gratifications (Kaye, 2010). Overall, traditional media users tend to be more passive, while Internet users are more interactive with their choice of media channel (Kaye & Johnson, 2011).
In regard to user-generated content such as that found through social media, Nardi, Schiano, Gumbrecht, and Swartz (2004) identified five main gratifications: recording one’s life, giving options, articulating sincerely felt emotions, expressing thoughts through writing, and establishing and sustaining relationships. Through focus group interviews, Dunne et al. (2010) explored why young people use and participate in specific social networking sites. They found that “communicating with others” and “friending” were sought gratifications among participants and participants obtained “peer acceptance” and “relationship maintenance” (Dunne et al., 2010). Specific to blog use, Kim and Johnson (2012) developed four general reasons people use political blogs: political surveillance/guidance; expression and affiliation; convenience/information seeking; and entertainment. They surveyed political blog readers and determined the primary reason readers accessed these blogs was for political surveillance and guidance. The respondents wanted to find out what others thought of important issues and remain up-to-date with current events. The authors recommended additional research to more fully understand how blog use may be related to knowledge or behavior (Kim & Johnson, 2012). It is evident that determining why people access blogs provides a better understanding of their motivations and needs, but this may vary depending on the type of blog content, such as agricultural blogs.

**Purpose/Research Questions**

This research fits into Priority Two of the National Research Agenda, which includes New Technologies, Practices and Products. Doerfert (2011) said the drastic and constant increase of scientific information must be maintained and utilized through the use of technology, in order to better and more efficiently inform consumers, particularly in agriculture. Therefore, there is a need for research about the use of new technologies and social media within agriculture can be used to better serve the selected target audience. By understanding consumers’ motivations and expected rewards from visiting agricultural blogs, agricultural communicators can make blogs more appealing, informative, and effective.

The purpose of this study was to describe the uses and gratifications of agricultural blog readers. This study investigated the following research questions:

1. What are respondents’ Internet and blog use characteristics?
2. What are respondents’ attitudes toward agriculture?
3. What are respondents’ primary motivations for accessing agricultural blogs?

**Methods**

This study used a descriptive survey research design. A Qualtrics online questionnaire was employed because of its cost effectiveness and surveys are frequently administered to the public for research purposes; therefore, users are already familiar with the instrument format (Irani, Gregg, & Telg, 2004). In order to reach blog readers, a systematic random sample of 18 active blogs was identified from a full list of farm and ranch blogs published on www.causematter.com (Payn-Knoper, 2014). Because no universal list of agriculture blogs exists, this list of blogs was selected because Payn-Knoper strives to include links to blogs from people who blog about their farms and ranches. Blog authors can request to be listed on the site.
or someone else can recommend a blog to be listed. The list on causematters.com has more than 100 blogs representing farms and ranches nationwide.

Farm and ranch blogs were selected because these are typically administered by those directly involved in production agriculture versus a communications professional representing an agricultural organization. The administrators of these blogs were contacted via email to seek their participation in the study; six blog administrators agreed. A link to the online instrument, developed in Qualtrics, was posted on these blogs. The blog administrators who agreed to participate were provided with information to post on their blog that contained a brief introduction to the study and a link to the online questionnaire for blog readers to access. This does result in a convenience sample, which is a limitation of the study, but this method of reaching blog readers has proven effective in prior research (Kim & Johnson, 2012). The blog administrators were contacted twice to remind them about the study and encourage them to remind their readers to participate.

When readers clicked on the link for the online questionnaire, they were first asked to indicate if they were at least 18 years old. Only those who said yes were allowed to participate. Respondents were provided with a definition of agriculture to help them understand the context for the survey. The online questionnaire contained four major sections: demographics, Internet and blog use, attitudes toward agriculture, and motivations for blog use. In the demographics section, respondents provided gender, age, education, primary industry, income, marital status, and number of children.

The Internet and blog use section asked respondents to indicate how many years they had used the Internet, time spent per week on the Internet and how often they accessed online news sites per week. This section also asked them to report the number of general blogs read on a regular basis and how often they read blogs in a typical week before having them indicate the same for agricultural blogs. Finally, this section asked respondents to identify how much they rely on blogs for agricultural news and information on a 5-point Likert-type scale where 1 = not at all and 5 = extremely.

The third section of the questionnaire asked respondents to indicate how knowledgeable they were about agriculture and how interested they were to learn about agriculture. These questions were answered using a Likert-type scale where 1 = not at all and 5 = extremely. This section measured respondents’ attitudes toward agriculture. To assess this, respondents were provided the following statement: “American agriculture is…” They then responded using a 5-point semantic differential scale with six bipolar adjective pairs: bad/good, unethical/ethical, unimportant/important, not beneficial/beneficial, negative/positive, and not valuable/valuable.

The final section of the questionnaire explored the motivations for using agricultural blogs using 21 statements adapted from Kim and Johnson (2012). Respondents indicated their level of agreement to each statement on a Likert-type scale where 1 = strongly disagree and 5 = strongly agree. A panel of experts reviewed the instrument to establish face validity. Post-hoc reliability analysis established Cronbach’s alpha coefficients of .86 for the attitudes toward agriculture construct and .89 for the motivations construct.
Data collection began February 10 and was completed March 31. During that time, 163 people clicked on the questionnaire link and 122 completed enough items to be included in study, resulting in a 74.8% completion rate. All of the collected data were analyzed in SPSS to calculate descriptive statistics in the form of frequencies, means, and standard deviations.

The average age of respondents was approximately 39 years old. The youngest respondent was 19 years old and the oldest respondent was 69 years old. Table 1 provides the demographic characteristics of respondents. Of the 122 respondents, the majority were female (80.3%, \( n = 98 \)). The greatest percentage (41.8%, \( n = 51 \)) had a bachelor’s degree and 31.1% (\( n = 38 \)) had completed a graduate or professional degree. The majority of respondents were married (62.3%, \( n = 76 \)) and did not have children under the age of 18 in the home (59.0%, \( n = 72 \)). Income levels were divided among the five categories provided. Nearly one-quarter (26.2%, \( n = 32 \)) earned $25,001-$50,000 annually and 19.7% (\( n = 24 \)) reported earning more than $100,000 annually. When asked what type of industry best describes where they spent the majority of time working, more than half (52.2%, \( n = 64 \)) said agriculture. The majority of respondents spent most of lives in areas classified as rural, either on a farm (59%, \( n = 72 \)) or not on a farm (17.2%, \( n = 21 \)).

Table 1

<table>
<thead>
<tr>
<th>Demographic Characteristics of Respondents</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender(^a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>21</td>
<td>17.2</td>
</tr>
<tr>
<td>Female</td>
<td>98</td>
<td>80.3</td>
</tr>
<tr>
<td>Education(^a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than High School</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>High School Grad or GED</td>
<td>7</td>
<td>5.7</td>
</tr>
<tr>
<td>Some college</td>
<td>12</td>
<td>9.8</td>
</tr>
<tr>
<td>2-year associate’s</td>
<td>10</td>
<td>8.2</td>
</tr>
<tr>
<td>4-year bachelor’s degree</td>
<td>51</td>
<td>41.8</td>
</tr>
<tr>
<td>Graduate or professional degree</td>
<td>38</td>
<td>31.1</td>
</tr>
<tr>
<td>Marital Status(^b)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>37</td>
<td>30.3</td>
</tr>
<tr>
<td>Married</td>
<td>76</td>
<td>62.3</td>
</tr>
<tr>
<td>Divorced</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>Widowed</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>Children Under 18 in the Home(^a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>47</td>
<td>38.5</td>
</tr>
<tr>
<td>No</td>
<td>72</td>
<td>59.0</td>
</tr>
<tr>
<td>Annual Income(^c)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $25,000</td>
<td>20</td>
<td>16.4</td>
</tr>
<tr>
<td>$25,001-$50,000</td>
<td>32</td>
<td>26.2</td>
</tr>
<tr>
<td>$50,001-$75,000</td>
<td>18</td>
<td>14.8</td>
</tr>
<tr>
<td>$75,001-$100,000</td>
<td>23</td>
<td>18.9</td>
</tr>
<tr>
<td>More than $100,000</td>
<td>24</td>
<td>19.7</td>
</tr>
</tbody>
</table>
Results

RQ1: What are respondents’ Internet and blog use characteristics?
To assess respondents’ use of the Internet and blogs, they were asked to indicate how much time they spent online and how often they read blogs. The majority of respondents (60.7%, n = 74) reported spending more than 8 hours online each week. Table 2 displays respondents’ time spent on the Internet each week.

Table 3 describes how frequently respondents accessed online news sites and read blogs each week. Forty-one percent of respondents (n = 50) reported accessing online news sites more than 10 times a week, while 20.5% (n = 25) accessed online news sites 7-10 times each week. When asked how often they read blogs each week, 30.3% (n = 37) indicated 4-6 times a week. Another 28.7% (n = 35) said they read blogs 1-3 times each week (Table 3).

Table 2
Respondents’ Time Spent on the Internet per Week (N = 119)

<table>
<thead>
<tr>
<th>Time</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 minutes to one hour</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td>1-2 hours</td>
<td>8</td>
<td>6.6</td>
</tr>
<tr>
<td>3-5 hours</td>
<td>14</td>
<td>11.5</td>
</tr>
<tr>
<td>6-8 hours</td>
<td>22</td>
<td>18.0</td>
</tr>
<tr>
<td>More than 8 hours</td>
<td>74</td>
<td>60.7</td>
</tr>
</tbody>
</table>
Table 3
Respondents’ Frequency of Accessing Online News Sites and Reading Blogs per Week

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(f)</td>
<td>(%)</td>
</tr>
<tr>
<td>Accessing Online News Sites(^a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>4</td>
<td>3.3</td>
</tr>
<tr>
<td>1-3 times</td>
<td>22</td>
<td>18.0</td>
</tr>
<tr>
<td>4-6 times</td>
<td>17</td>
<td>13.9</td>
</tr>
<tr>
<td>7-10 times</td>
<td>25</td>
<td>20.5</td>
</tr>
<tr>
<td>More than 10 times a week</td>
<td>50</td>
<td>41.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reading Blogs(^b)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3 times</td>
<td>35</td>
<td>28.7</td>
</tr>
<tr>
<td>4-6 times</td>
<td>37</td>
<td>30.3</td>
</tr>
<tr>
<td>7-10 times</td>
<td>19</td>
<td>15.6</td>
</tr>
<tr>
<td>More than 10 times a week</td>
<td>28</td>
<td>23.3</td>
</tr>
</tbody>
</table>

Note. \(^a\)(\(N = 118\)) \(^b\)(\(N = 119\))

Respondents also provided how often they read agricultural blogs in a typical week (Table 4). Close to half (45.9\%, \(n = 56\)) reported 1-3 times a week and nearly a quarter (23.8\%, \(n = 29\)) said 4-6 times a week.

Table 4
Respondents’ Frequency of Reading Agricultural Blogs per Week (\(N = 118\))

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(f)</td>
<td>(%)</td>
</tr>
<tr>
<td>1-3 times</td>
<td>56</td>
<td>45.9</td>
</tr>
<tr>
<td>4-6 times</td>
<td>29</td>
<td>23.8</td>
</tr>
<tr>
<td>7-10 times</td>
<td>9</td>
<td>7.4</td>
</tr>
<tr>
<td>More than 10 times a week</td>
<td>24</td>
<td>19.7</td>
</tr>
</tbody>
</table>

In addition to how frequently they read agricultural blogs, respondents were asked to indicate how much they rely on blogs for agricultural news and information. Respondents indicated their level of reliance on a Likert-type scale where 1 = not at all and 5 = extremely. The mean score of 2.97 (\(SD = 1.18\)) indicates respondents somewhat rely on blogs for this type of information.

**RQ2: What are respondents’ attitudes toward agriculture?**

Respondents were asked to indicate how knowledgeable about agriculture and interested they were to learn about agriculture on a Likert-type scale where 1 = not at all and 5 = extremely. The mean score for how knowledgeable they felt they were about agriculture was 4.13 (\(SD = .97\)) indicating a moderately high level of self-perceived knowledge. The mean score for their interest in learning about agriculture was 4.64 (\(SD = .69\)), again revealing respondents were very interested in this topic area.

To measure attitudes toward agriculture, respondents provided their response to the statement: “American agriculture is...” This index used a 5-point semantic differential scale with six bipolar adjective pairs: bad/ good, unethical/ethical, unimportant/important, not
beneficial/beneficial, negative/positive, and not valuable/valuable. Overall, respondents indicated very positive attitudes toward agriculture (Table 5).

Table 5
_Respondents’ Attitudes Toward Agriculture (N = 118)_

<table>
<thead>
<tr>
<th>Attitude</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bad/Good</td>
<td>4.70</td>
<td>.70</td>
</tr>
<tr>
<td>Unethical/Ethical</td>
<td>4.47</td>
<td>.84</td>
</tr>
<tr>
<td>Important/Unimportant*</td>
<td>4.92</td>
<td>.48</td>
</tr>
<tr>
<td>Beneficial/Not Beneficial*</td>
<td>4.87</td>
<td>.41</td>
</tr>
<tr>
<td>Negative/Positive</td>
<td>4.50</td>
<td>.78</td>
</tr>
<tr>
<td>Not valuable/Valuable</td>
<td>4.93</td>
<td>.36</td>
</tr>
</tbody>
</table>

Scores based on semantic differential scale with 1 = bad and 5 = good. *Item was reverse coded.

**RQ3: What are respondents’ primary motivations for accessing agricultural blogs?**

To measure respondents’ primary motivations for accessing agricultural blogs, respondents were provided with 21 statements and asked to provide their response on a 5-point Likert-type scale were 1 = strongly disagree and 5 = strongly agree. Table 6 displays the descriptive statistics for all the motivation statements.

The statements with the highest mean scores were “To find out what other people think about important issues or events” (M = 4.10, SD = .88) and “To find alternatives not covered by traditional news sources” (M = 4.09, SD = 1.00). These were followed closely by “To find stories that are enjoyable” (M = 4.00, SD = .87) and “To keep up with main issues of the day” (M = 3.96, SD = .98). The prompts that received the lowest mean scores were “Because news web browsing is exciting” (M = 2.88, SD = 1.06) and “To participate in discussion/chat rooms” (M = 2.61, SD = 1.04).
Table 6
*Agricultural Blog Readers’ Motivations for Accessing Agricultural Blogs*

<table>
<thead>
<tr>
<th>I read agricultural blogs…</th>
<th>$n$</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>To find out what other people think about important issues or events</td>
<td>121</td>
<td>4.10</td>
<td>0.88</td>
</tr>
<tr>
<td>To find alternatives not covered by traditional news sources</td>
<td>121</td>
<td>4.09</td>
<td>1.00</td>
</tr>
<tr>
<td>To find stories that are enjoyable</td>
<td>122</td>
<td>4.00</td>
<td>0.87</td>
</tr>
<tr>
<td>To keep up with main issues of the day</td>
<td>121</td>
<td>3.96</td>
<td>0.98</td>
</tr>
<tr>
<td>Because the information is easy to obtain</td>
<td>118</td>
<td>3.76</td>
<td>0.90</td>
</tr>
<tr>
<td>To feel in touch with what is happening in the country</td>
<td>120</td>
<td>3.75</td>
<td>1.02</td>
</tr>
<tr>
<td>For a wide range of viewpoints</td>
<td>121</td>
<td>3.72</td>
<td>0.98</td>
</tr>
<tr>
<td>To access information quickly</td>
<td>121</td>
<td>3.65</td>
<td>1.00</td>
</tr>
<tr>
<td>To access information at any time</td>
<td>120</td>
<td>3.53</td>
<td>0.99</td>
</tr>
<tr>
<td>To help me make up my mind about important issues or events</td>
<td>121</td>
<td>3.40</td>
<td>1.01</td>
</tr>
<tr>
<td>To access information at any place</td>
<td>121</td>
<td>3.40</td>
<td>0.99</td>
</tr>
<tr>
<td>To communicate with others about issues</td>
<td>121</td>
<td>3.37</td>
<td>1.22</td>
</tr>
<tr>
<td>To give me something to talk with others about</td>
<td>121</td>
<td>3.32</td>
<td>1.15</td>
</tr>
<tr>
<td>To find specific information I am looking for</td>
<td>121</td>
<td>3.31</td>
<td>0.96</td>
</tr>
<tr>
<td>To get detailed analysis of complicated issues</td>
<td>120</td>
<td>3.29</td>
<td>1.16</td>
</tr>
<tr>
<td>To express my thoughts online</td>
<td>121</td>
<td>2.97</td>
<td>1.11</td>
</tr>
<tr>
<td>Because news web browsing helps me relax</td>
<td>121</td>
<td>2.95</td>
<td>1.14</td>
</tr>
<tr>
<td>To use as ammunition in arguments with others</td>
<td>121</td>
<td>2.95</td>
<td>1.11</td>
</tr>
<tr>
<td>To feel in touch with international events</td>
<td>121</td>
<td>2.92</td>
<td>1.02</td>
</tr>
<tr>
<td>Because news web browsing is exciting</td>
<td>121</td>
<td>2.88</td>
<td>1.06</td>
</tr>
<tr>
<td>To participate in discussion/chat rooms</td>
<td>121</td>
<td>2.61</td>
<td>1.04</td>
</tr>
</tbody>
</table>

Scores based on Likert scale with $1 = strong
disagree$ and $5 = strongly agree$.

**Conclusions & Implications**

Previous research on agriculture’s use of social media found that those who are providing the information find this form of online communication to be worthwhile and effective (Meyers et al., 2011; Moore et al., 2013; White et al., 2014). However, others have found a small amount of agriculturists are using social media tools (Doerfert, 2012; Shaw et al., 2013). This current study provides valuable insight into a nascent area of research regarding agriculture’s use of a specific form of social media – blogs. While others have examined agricultural blogs (Fannin & Chenault, 2004; Moore et al., 2013; Rhoades & Aue, 2010; Rhoades & Hall, 2007), the current study is the first effort to understand the readers’ motivations for accessing this form of online communication outlet.

The respondents in this study were primarily female and well educated. The average age was 39 and most were married with no children under the age of 18 in the home. One quarter of the respondents had modest annual incomes ($25,001-50,000) while nearly 20% earned more than
$100,000 annually. Respondents were very engaged in agriculture, either through their careers or in the community where they have spent most of their life.

In terms of general Internet use, three-quarters of respondents spent more than six hours online each week. This indicates participants spend a significant amount of time online, which presents an opportunity for blog authors to reach more readers. The number of times blogs were read varied as did how often they accessed online news sites. When asked specifically about agricultural blog readership, the majority of respondents said they read agriculture blogs one to six times a week. This implies most respondents utilize agriculture blogs on a regular basis.

Respondents were overall very positive in their attitudes toward agriculture. The semantic differential items indicated they viewed American agriculture as very valuable, important, and beneficial. They also indicated high self-perceived values of agriculture knowledge and interest in learning more about the industry. These findings, combined with the demographic characteristics, indicate the readers of agriculture blogs are already familiar with and supportive of the agriculture industry. Agriculturists are often criticized for “preaching to the choir” and it appears these respondents support this critique.

Although uses and gratifications research is more than 30 years old (Katz et al, 1973), it continues to have heuristic value in application to online media (Kaye & Johnson, 2011; Kim & Johnson, 2012; McQuail, 2005; Rubin, 2009). As the sources of media have evolved, so too have consumers’ preferences for how they use that media to achieve their needs. The exploration of readers’ primary motivations for accessing agriculture blogs indicated the highest means belonged to statements that can be classified as surveillance/guidance gratifications: “to find out what other people think about important issues or events” and “to find alternatives not covered by traditional news sources.” This is in agreement with the primary motivations Kim and Johnson (2012) identified for political blog readers. Smith (2008) recognized that blogs can be valuable communication outlets because they do not have the traditional gatekeeping barriers that would prevent some from having a voice in the conversation on a topic. It seemed respondents appreciated being about to find information from a variety of sources.

The motivation statements with the lowest reported mean scores included “to participate in discussion/chat rooms” and “because news web browsing is exciting.” This finding implies readers do not access agricultural blogs solely for entertainment purposes, which is similar to prior research regarding political blog readers’ motivations that indicated entertainment was not an important motivation (Kim & Johnson, 2012).

**Recommendations**

One of the basic principles of effective communication is to know your audience, and Kaye (2005) recognized the need to understand more about blog readers. By having a deeper understanding of what motivates readers to access agricultural blogs, agricultural communicators can improve the design and placement of agricultural information. It appears readers of agricultural blogs are primarily those who already have a connection and positive perspective of the industry. While these individuals represent an important audience, they are not the consumers who need to be reached to provide a better understanding of the agricultural industry. In their study of why agriculturists used social media, White et al. (2014) said the participants...
wanted to combat negative or incorrect information about agriculture. Practitioners need to be creative and seek innovative ways to draw in readers from a broader base to fully extend their information to those outside the traditional audience.

Studying the uses and gratifications of readers will improve future efforts to target publics with accurate and informative content via blogs. Based on this study’s findings, agricultural blog administrators should strive to provide blog content that presents alternative perspectives and viewpoints not presented in traditional news outlets. This means blog authors should be aware of current issues and events of importance to their readers and strive to provide another perspective or interpretation of the information.

This study provides a glimpse into who agriculture blog readers are and what they want. However, it does highlight the potential issue that these blogs may not be reaching audience members outside of the agriculture industry. It could be that those individuals did not participate in the study so additional research is needed to further examine blog readers’ uses and gratifications. A limitation of this study is the small number of blogs included. In the future, additional blogs should be reached so a larger group of respondents can be surveyed. The blogs in this study were all farm and ranch blogs, but many other types of blogs exist in agriculture such as those for commodity groups and agribusinesses. Subsequent data collection and analysis would help further explore what influence demographic characteristics have on motivations to read agricultural blogs. Finally, the motivations assessed in this study are based on previous studies completed outside the agriculture industry. It is possible additional motivations for reading agricultural blogs could exist and would be best identified through the use of qualitative methods.

References


The Interaction of Learning Style on Measures of Successful Intelligence and Motivation in Secondary Agriculture Students Exposed to Experiential and Direct Instruction

Marshall A. Baker, Oklahoma State University
J. Shane Robinson, Oklahoma State University

Abstract

Understanding the teaching and learning paradigm is a relentless search for educators. Because individual students bring their own learning style preferences to the learning environment, teachers are asked to consider and even adjust their teaching to these preferences to improve student learning. These considerations have implications for impacting students’ success or lack thereof in the classroom as well as their motivation to learn the content. This study determined the interactions that existed between learning style and successful intelligence and motivation of secondary agricultural education students. No statistically significant differences were found regarding teaching approaches and students’ outcomes on examinations based on their preferred learning styles. Recommendations point to infusing variability in the classroom by employing the experiential learning method without fear of isolating a particular set of students based on their preferred learning style. Further work should determine if students’ learning styles predict their participation in FFA and SAE.

Introduction

Agricultural education has prescribed to an experiential philosophy of learning since the inception in the early 1900’s (Baker, Robinson, & Kolb, 2012; Knoblock, 2003; Phipps, Osborne, Dyer, & Ball, 2008; Roberts, 2006). Research in agricultural education (Anyadoh & Barrick, 1990; Cheek, Arrington, Carter, & Randell, 1994; Cheek & McGee, 1985; Kotrilik, Parton, & Leile, 1986), as well as in other educational domains (Abdulwahed & Nagy, 2009; Eyler & Giles, 1999; Eyler & Halteman, 1981; Markus, Howard, & King, 1993; Specht & Sandlin, 1991; Steinke & Buresh, 2002), has provided evidence that experiential learning improves academic performance, retention, satisfaction, complexity, and meta-cognitive process development. Though this research has been promising, Kirschner, Sweller, and Clark (2006) argued sufficient research, including controlled experiments, has not been conducted to warrant such a strong faith in experiential learning. Moore (1999), a supporter of experiential learning, echoed the sentiment of Kirschner et al. (2006) and shared that supporters of experiential learning must be willing to admit that learning experientially does not always work.

A controlled experiment seeking to identify the effects of an experiential approach to learning concluded that an experiential approach to learning, as compared to that of Direct Instruction (DI), yielded higher creativity in context performance and significantly higher practical use of information, while DI yielded higher analytical scores (Baker & Robinson, 2014). Though the results were encouraging, it can be questioned whether certain types of learners benefit greater from this more constructivist approach to learning. Research has demonstrated, through both exploratory and confirmatory factor analysis, that there is an underlying two-factor ipsative structure of how students transform educational experiences congruent with Kolb’s (1984) theory of experiential learning (Kayes, 2005). However, research indicating that a student’s learning preferences have an effect on learning outcomes has produced conflicting messages.
Rutz (2003) and Boyatzis and Mainemelis (2000) purported that a relationship exists between academic achievement and the converging learning style. Others have suggested improved academic performance for both converging and assimilating learning styles (Kolb, 1984; Lynch, Woelfl, Steel, & Hanssen, 1998; Malcom, 2009; Newland & Woelfl, 1992). Alireza, Mahyuddin, Elias, Shafee, and Shabani (2011), in reference to studies of learning styles and performance, explained that it was imperative to utilize measures beyond standard examinations because the differences between learning style products are not detectible without broader assessments. Sternberg and Grigorenko (2004) also shared that when students are taught in ways that meet how they learn, they outperform students who are not.

**Theoretical/Conceptual Framework**

Experiential learning, defined often by Kolb’s (1984) Experiential Learning Theory (ELT), presents learning as a cyclical process composed of the resolution of two dialectically opposed modes of thinking. ELT is a synthesis of work from key theorists (Dewey, 1934, 1938, 1958; Freire, 1974; James, 1890; Jung, 1960, 1977; Lewin, 1951; Rogers, 1961) that is built on the foundational definition of learning as the “process whereby knowledge is created through the transformation of experience” (Kolb, 1984, p. 38). Experiential learning theory is built upon six propositions: (a) learning is a process, not a set of outcomes, (b) all learning is ultimately re-learning, (c) learning involves the resolution of conflicts, (d) learning is a holistic process, (e) as the learner interacts with their environment, learning occurs, and (f) learning involves the process of creating knowledge (Kolb, 2005). Agricultural education has always been in a unique position to embrace this epistemological approach (Baker et al., 2012). ELT has been shown to increase student satisfaction in the course, improve retention of information as measured on examinations, develop a deeper, more complex understanding of concepts, improve practical use of information, and develop meta-cognitive skills useful in all domains (Abdulwahed & Nagy, 2009; Eyler & Giles, 1999; Eyler & Halteman, 1981; Markus, Howard, & King, 1993; Specht & Sandlin, 1991; Steinke & Buresh, 2002).

The learning structure purported by ELT is grounded in four learning modes – CE, RO, AC, and AE. Any one mode, or combination of modes, can govern learning at any given moment (Kolb, 1984). This complex learning process is not identical for everyone. As an individual seeks to resolve the conflicts associated with various experiences, there are preferences in the tools or learning modes that are used. “The dilemma for the scientific study of individual differences is how to conceive of general laws or categories for describing human individuality that do justice to the full array of human uniqueness” (Kolb, 1984, p. 63). Kolb (1984) warned of the formist epistemology of learning types that are viewed as reality. In practice and research, there is a marked tendency to view these learning styles as fixed traits (Garner, 2000). An alternative epistemological approach, of which Kolb (1984) subscribes, is contextualism, where the person is examined in the context of the event by which both the person and the event are shaped.

Drawing from Tyler’s (1978) possibility processing structures, Kolb (1984) explained that, the implication of the contextualist worldview for the study of human individuality is that psychological types or styles are not fixed traits but stable states. The stability and the endurance of these states in individuals comes not solely from fixed genetic qualities or characteristics of human beings; nor, for that matter, does it come solely from the...
stable, fixed demands of environmental circumstances. Rather, stable and enduring patterns of human individuality arise from consistent patterns of transaction between the individual and his or her environment. The way we process the possibilities of each new emerging event determines the range of choices and decisions we see. The choices and decisions we make, to some extent, determine the events we live through, and these events influence our future choices. (pp. 63-64)

Individual learners create programs for how they choose to process experiences. This program includes apprehension and/or comprehension preferences, as well as intention and/or extension preferences.

These preferences for grasping and transforming experiences have been captured psychometrically since 1971 through the Kolb Learning Style Inventory (KLSI) (Kolb, 1985, 1986; 1999, 2007). A four learning style model, as well as a nine learning style model, has been utilized. In this study, the emphasis is placed on the four learning style approach of the KLSI 3.1 (Kolb, 1999). The nine-style approach also will be introduced briefly, as it is simply a model including greater diversity in classification. The four learning styles are based on the four learning modes of ELT (Kolb, 1984). The most recent manual for the KLSI 3.1(1999) explained these four modes in a more practical way (see Table 1).

Table 1  
**KLSI 3.1 Description of the Four Phases of the Experiential Learning Process**

<table>
<thead>
<tr>
<th>Learning Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiencing</td>
<td>Learning from specific experiences, being sensitive to feelings and people.</td>
</tr>
<tr>
<td>Observation</td>
<td>Observing before making judgments, viewing issues from different perspectives, looking for the meaning of things.</td>
</tr>
<tr>
<td>Thinking</td>
<td>Analyzing ideas logically, planning systematically, acting on an intellectual basis.</td>
</tr>
<tr>
<td>Action</td>
<td>Learning through hands-on activities, dealing with people and events through action.</td>
</tr>
</tbody>
</table>

The KLSI 3.1 (1999) results in one of four learning styles: diverging, assimilating, converging, and accommodating. An individual with the diverging style prefers to learn primarily through feeling (CE) and reflecting (RO). This style is known as the creator (see Figure 1). A person with this preference is best at viewing concrete situations from a myriad of perspectives. Divergent learners prefer to observe to taking action, and enjoy situations that call for a wide range of feelings and ideas. In formal learning situations, a learner of this preference would prefer to work in groups and needs to receive personalized feedback and attention (Kolb & Kolb, 2009).

Learners with an assimilative style prefer to learn through thinking (AC) and acting (AE) and are referred to in Figure 1 as the planner. They like to make decisions based on logical reasoning, and would prefer to deal with technical tasks to social and interpersonal issues. These individuals prefer that a theory is elegant and logical rather than being practical. Assimilators may prefer to work alone, and do not make quick decisions but spend adequate time thinking.
through a problem before taking action. In formal settings, these learners prefer lectures, readings, exploring analytical models, and being given adequate time to think things through (Kolb & Kolb, 2009).


Learners with a converging style emphasize thinking (AC) and acting (AE), and are referred to in Figure 1 as the decision maker. Those who prefer to learn in this way find practical uses for ideas and theories. Like assimilators, they prefer to solve problems and make decisions based on finding logical solutions. Interpersonal and/or ambiguous situations are not an area of strength, as feelings and reflection is not a mode of learning indicative of this style. In formal learning settings, a converging learner prefers to experiment with ideas. This includes simulations, laboratory based learning, and practical applications (Kolb & Kolb, 2009).

Finally, learners with an accommodating style learn through acting (AE) and feeling (CE) primarily. They are referred to as the doer (see Figure 1). This learning preference seeks hands-on experiences and is comfortable in ambiguous learning situations. Setting goals and meeting challenges is indicative of this style. These learners tend to go with their gut feelings and other people over a logical analysis of issues. They can be disorganized and can act before thinking because of their lack of preference for reflecting and thinking. In formal learning settings, accommodators prefer to work in groups and find ways to accomplish the group goals. Fieldwork is preferred to theoretical discussions (Kolb & Kolb, 2009).

The work of David Hunt (1987) and associates (Abby, Hunt, & Weiser, 1985) demonstrated that the four learning styles could be expanded to nine including a northerner, easterner, southerner, westerner, and a balancing learning style. This expanded definition of learning style is depicted in Figure 2 and increases the “resolution of the learning style type grid from four to nine pixels,” which could “help deal with a common misconception of ELT learning styles: that is, the tendency to treat the four learning styles as four categorical entities rather than continuous
positions on the dimensions of AC-CE and AE-RO” (Kolb & Kolb, 2005b, p. 198). As such, the learning styles have evolved from diverger to diverging to reflect this important distinction.

The nine-style grid becomes the foundation for learning spaces, an important distinction within ELT (Kolb & Kolb, 2009). For learning to occur, space must be created for all four modes of learning. The concept of learning space, drawn from Lewin’s (1951) field theory, is expressed in secondary educational classrooms by the choices the instructor makes in terms of the content taught and method of delivery (Kolb & Kolb, 2009). Learning spaces are nested in the social system in such a way that the environment has an impact on the context of the space by which learning occurs. Bronfenbrenner (1977, 1979) described the ecology of learning as nested structures of learning. The microsystem refers to the here and now setting such as a course or classroom, while the mesosystem refers to the broader perspective including other classes, home life, and the family. The exosystem includes the formal and informal social structures present in the immediate learning environment such as the rules, policies, and culture of the high school. Finally, the macrosystem speaks to the broader guidelines and the wider culture of education, the community, and the school which all influence a student’s microsystem and mesosystem. It is important to maintain the concept of learning spaces as an instructor designs instruction to customize the space and compensate for both the instructor’s and students’ preferred styles of learning (Kolb & Kolb, 2009).

**Purpose of the Study**

This study is the second element of a four-stage research project intending to understand better the effects of experiential learning in developing successful intelligence and motivation of secondary agriculture students. The first study focused on the effects of an experiementally designed curriculum (Baker & Robinson, 2014, Kolb, 1984), compared to that of direct instruction (Becker, 1992; Gersten, Carnine, & White, 1984; Joyce & Weil, 2000; Moore, 2007; Pearson & Gallagher, 1983; Rosenshine & Meister, 1992; Vygotsky, 1978), on secondary
students’ successful intelligence. It was found that an experiential curriculum led to statistically significant gains in creative and practical performance, while direct instruction led to statistically significant gains in analytical scores (Baker & Robinson, 2014). Therefore, the purpose of this second study was to determine what interactions existed between learning style and successful intelligence and motivation of secondary agricultural education students. This study aligns with the National Research Agenda of the American Association of Agricultural Education (Doerfert, 2011). The results address research priority four and five, as they specifically addresses: (a) a deepening of understanding of effective teaching and learning processes, (b) assessment of various learning interventions, and (c) document the outcomes of an experiential approach to learning. Two research questions framed this study:

1. What are the preferred learning style indicators of secondary agricultural education students in the selected agricultural education program, as measured by the KLSI?
2. What interaction exists between learning style, measures of successful intelligence, and student motivation?

Methods and Procedures

The population of interest in this experimental design study was all students enrolled in the participating secondary agricultural education program (N = 120). The agricultural education program is in a rural community with a population of approximately 46,000 people (www.city-data.com/city/Stillwater-Oklahoma.html). The entire program was chosen to attempt to acquire a representative sample of a typical, holistic, agricultural education program in Oklahoma. This somewhat isolated population, though limiting in generalizability, provided additional control of nuisance variables associated with varying social contexts of communities and schools. From this population, a sample of 80 participants completed IRB consents and assents and participated in the full study. Of the 80 participants, 38 were assigned to the treatment group and 42 to the comparison group. Descriptive statistics were used to answer research question one. Research question two was answered through a complete random factorial two-by-two (CRF-22) design employing two omnibus MANOVA analyses – one focusing on the grasping dimension, and one focusing on the transforming dimension. Simple main effects were of particular interest in this study to determine if interactions existed between learning style and other dependent measures of successful intelligence and student motivation (Stevens, 2009).

Wind turbine blade design was the content of interest for the experiment (Blind Author, 2012). This content was chosen purposefully as it was congruent with course objectives for agricultural education and included adequate science, technology, engineering, and math (STEM) concepts. The goal was to provide a full unit of instruction, which typically, would be taught over the course of one week in an instructional setting, during a four-hour period to maintain the experimental control. Instruction was delivered in two different treatments – direct instruction and experiential learning designs. To reduce teacher effect, eight instructors were assigned randomly to the two experimental conditions so that each condition had a lead instructor and three assistant instructors (Weiss, 2010).

Kolb’s Learning Style Inventory 3.1
Kolb’s (1999) KLSI 3.1 is one of the most influential and widely distributed instruments used to measure individual learning preference (Kayes, 2005). The KLSI is based on Kolb’s (1984) ELT, where learning consists of four constructs – CE, RO, AC, and AE. This instrument
includes twelve sentence stems followed by four possible sentence endings. Subjects rank each of the four endings based on their preference for using the four modes. This procedure results in a 48-response instrument that is self-reported and self-scoring. A total score was tabulated for each learning mode, and then combined scores for each of the dialectically opposing modes of grasping and transforming (Kolb, 1984) were calculated. Research has generally supported the internal reliability of the LSI-2, the previous version of the instrument, with Cronbach’s alphas ranging from .80 to .87 (Geiger, Boyle, & Pinto, 1993; Loo, 1996; Willcoxson & Prosser, 1996). Kayes (2005) analyzed the current version, KLSI 3.1, for internal reliability and found Cronbach’s alphas ranging from .77 to .82 for each of the four-dimensional constructs and .77 to .84 for the grasping and transforming constructs, respectively. In addition, research (Kayes, 2005; Loo, 1999a, 1999b; Yahya, 1998) has confirmed the internal construct validity of a two-factor structure proposed originally by Kolb (1984). Thus, it was determined that the KLSI 3.1 was a reliable and valid measure of learning style in this study.

**Approach to Analyzing the Effect of Learning Styles**

One week prior to the experiment, Kolb’s (1999) Learning Style Inventory Version 3.1 (Kolb, 2007) was administered to each of the students who agreed to participate in the study. This instrument was scored, and a data source of subjects with the specified learning style was identified. It was found that certain learning styles had inadequate sample sizes to achieve adequate statistical power (see Figure 3). However, when learning style was viewed as preference for the two dialectically opposed ways of transforming experience, adequate sample size was achieved. A procedure was then employed to view learning style in a two-dimensional way rather than the standard four-dimensional manner outlined by Kolb (2007). This procedure required that participants be classified based on their preferences for grasping information and their preferences for transforming information. Each participant was assigned two learning preferences. The statistical analyses included results for participants identified by a grasping preference and for participants identified by a transforming preference. This analysis not only provided procedural checks (Stevens, 2009), but also allowed the examination of the role of learning style with adequate sample size and power.
Sternberg’s (1999a) Theory of Successful Intelligence framed the outcome variables for this study. Sternberg (1999a) listed four factors of learning that should be considered: a) analytical intelligence: skills used to analyze, evaluate, judge, or compare and contrast, b) practical intelligence: skills used to implement, apply, or put into practice ideas in real-world contexts, and creative intelligence: skills used to create, invent, discover, imagine, suppose, or hypothesize. Sternberg (1999a) purported that a construct of successful intelligence “better captures the fundamental nature of human abilities” (p. 292). This concept of intelligence stands in contrast to the conventional general ability views of intelligence that Sternberg (1999a) described as narrowly based and incomplete. Because, at times, the method of experiential learning has been a difficult treatment to understand fully (Roberts, 2012), a broader perspective of learning was utilized in this study.
The full description of the measurement models, including discussions of validity and reliability, can be read in previous works (Baker & Robinson, 2014; Blind Author, 2012). However, a brief review of each measure is provided. The AWEA, a criterion-referenced test based on the selected educational objectives the blade design instructional unit, served as the main analytical assessment for the study. The assessment was created as a collaborative effort by the researchers and the KidWind® staff and consultants, experts in the field of wind energy engineering, and pedagogical experts in agricultural education. Wiersma and Jurs (1990) suggested eight specific methods to increase the reliability of criterion-referenced examination, of which the AWEA conformed. The AWEA produced Kuder-Richardson 20 (Cronbach, 1970) reliability coefficients, which were as follows: (a) .82 for the pre-test, and (b) .90 for the post-test. Based on these coefficients, it was determined that the AWEA was a reliable measure of students’ analytical knowledge for this study.

Sternberg (1998) explained that practical knowledge requires students to apply, use, put into practice, implement, employ, and render practical what they know. The practical assessment used in this study was an authentic assessment that represented the most logical extension of the lesson – to design, build, and test a wind blade using materials provided by the instructors. Each student was given a universal hub and asked to create a hub design intended to produce the most voltage possible using a common bank of materials in one hour. Each blade design was attached to a model tower containing a small generator, which was placed in front of a fan set at a constant speed. The voltage output was measured using a voltage meter. All variables, aside from the design of the blade, were held constant, and each voltage output was recorded.

Creativity, the ability to produce something that is both novel and useful (Sternberg, 1998), was also a variable of interest for the study. Based on Guilford’s (1950) proposal that creativity could be measured with a psychometric approach, Torrance (1974) developed the Torrance Tests of Creative Thinking (TTCT). The TTCT (Torrance, 1974) operationalized creativity as statistical infrequency, which can be calculated and scored objectively. Two pictures were taken of each blade design created by the participants, and they were assessed on the six chosen divergent elements. A statistical scoring process was utilized to determine the divergence of each design.

**Instructional Materials Motivation Survey**

Motivation also was a key variable of the study. Keller (2006) developed the IMMS as a “situational measure of students’ motivation to learn with reference to a specific learning condition” (p. 1). The instrument was designed in correspondence with the ARCS Model (Keller, 1987), based on current literature on human motivation (Keller, 1979, 1984, 1999). “The goal with these instruments is to find out how motivated students are, were, or expect to be, by a particular course” (Keller, 2006, p. 1). The IMMS can be used with adults, college students, and secondary students. The instrument contains 36 statements related to the four conditions that must be met for people to become and remain motivated: (a) attention, (b) relevance, (c) confidence, and (d) satisfaction. Participants respond using a summed rating scale indicating that each statement is: (1) not true, (2) slightly true, (3) moderately true, (4) mostly true, or (5) very true. The scoring guide indicates which construct each statement measures and the statements that are reverse coded. The instrument can be scored for each of the subscales or added for a total motivation score. Bivariate correlation analysis indicated high correlations between each subscale and the overall motivation score; so, it was decided to use the total motivation score as the indicator of motivation for statistical analysis. The Cronbach’s alpha
reliability estimates of attention, relevance, confidence, satisfaction, and total scores, were .89, .81, .90, .92, .96, respectively, and thus determined to be adequate.

Findings

Research question one sought to determine the learning styles of the secondary agricultural education students participating in this experiment. Figure 1 provides a visual of the learning style breakdown, and also includes the number of students identified in each category. Under the conventional four learning style framework (Kolb, 2007), it was determined that 41 (51.25%) students were classified as accommodating, 16 (20.00%) diverging, 12 (15.00%) converging, and 11 (13.75%) assimilating. It was thus deduced that 53 (66.25%) students transform via extension and 27 (33.75%) students transform via intention. Also, 57 (71.25%) students grasp via apprehension while 23 (28.75%) students grasp via comprehension.

Research question two sought to determine what interactions existed between students’ learning styles, their successful intelligence, and the instructional approach chosen. An omnibus multivariate analysis of variance was utilized (see Table 1).

Table 1
Summary of Two MANOVA Analyses Testing for Both Simple Main and Main Effects of the Treatment Conditions by Learning Style (df = 73)

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Λ</th>
<th>F</th>
<th>p</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group x Transform</td>
<td>.93</td>
<td>.96</td>
<td>.44</td>
<td>.41</td>
</tr>
<tr>
<td>Group x Grasp</td>
<td>.98</td>
<td>.30</td>
<td>.87</td>
<td>.11</td>
</tr>
<tr>
<td>Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transform</td>
<td>.63</td>
<td>10.95</td>
<td>.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Grasp</td>
<td>.66</td>
<td>9.55</td>
<td>.00</td>
<td>.99</td>
</tr>
</tbody>
</table>

Using Wilk’s statistics, there were no statistically significant simple main effects between the treatment group and the transformation learning style, Λ = .93, F(3,76) = .96, p = .44. Viewing the simple main effects from the grasping learning style distinction, non-significant interactions were also found Λ = .98, F(3,76) = .30, p = .87. Kolb’s (1984) learning style inventory maintains a two-factor ipsative structure (Kayes, 2005), and thus, this analysis of learning style in the two-factor structure demonstrated no statistically significant simple main effects, or interaction, between learning styles and the experimental conditions regarding measures of successful intelligence and student motivation.

Conclusions, Discussions, and Implications

Conclusion 1: Agricultural education students in this study were predominantly accommodators. As such, students generally preferred to transform via extension and grasp via apprehension.

The trend of homogeneity in learning styles within selected settings has emerged in a number of studies (Kolb & Kolb, 2005). A similar study of learning styles found the majority of students in the same college program, same major, pursuing similar passions, and involved in a common activity were quite similar in learning style as defined by the KLSI (Kolb, 1999). In agricultural
education, Brown (2013) found this same trend, as 60% of students attending a leadership camp were extroverted in their learning style – another perceived match of a learner and environment.

Kolb (2007), in the KLSI workbook, described an accommodator as a “do-er” (p. 4). This description, juxtaposed with the FFA Mission of Learning to Do, Doing to Learn, Earning to Live, and Living to Serve (National FFA Organization, 2008), begs one to query if agricultural education, as operationalized by the FFA program of interest in this study, strongly favors this preference for apprehension and extension. Preliminary data (Blind Author, personal communication, 2013) has also found that teachers in Oklahoma exhibit a strong bias toward a coaching teaching preference, which coordinates with the preference for apprehension and extension. Though learning style did not interact with measures of successful intelligence, the dominance of one learning style could be an indication of a lack of balance in teaching toward all four modes of learning. If agricultural education is naturally experiential (Baker et al., 2012), how does the program in Oklahoma recruit and retain students with a preference toward grasping through comprehension and transforming through intention?

Conclusion 2: When taught either through experiential learning or direct instruction, students’ analytical, creative, and practical performance, as well as motivation for the course, was not affected by their preferred learning style.

The results of this study refute the claims of differences (Kolb, 1984; Lynch, Woelfl, Steel, & Hanssen, 1998; Malcom, 2009; Newland & Woelfl, 1992 Rutz et al., 2003; Sternberg & Grigorenko, 2004) in student outcomes based on learning preferences. This study explored the role of learning style in two very different instructional approaches, and utilized a number of various performance measures. Though differences were found between the learning approaches, learning style played no statistically significant role in those differences. This finding appears congruent with literature on a battery of learning style assessments that find they rarely play a significant role in formal learning processes (Cano, Garton, & Raven, 1992; Garton, Spain, Lamberson, & Spiers 1999; Thornton, Haskell, & Libby, 2006; Whittington & Raven, 1995). In formal educational settings, what is important is a blended approach where students each have the opportunity to work within their style (Baker et al, 2012). This holistic approach to learning is vital to the overall meta-cognitive growth of students as they build cognitive complexity, as explained by Kolb’s (1984) developmental cone. Learning styles seem to be an effective framework to design instruction to develop the whole child as Dewey (1938) explained, rather than identifying a predictive mechanism to identify who is more likely to be successful at a given academic task. Kolb (1984) explained that, “the learning process is not identical for all human beings. Rather, it appears that the physiological structures that govern learning allow for the emergence of unique individual adaptive processes that tend to emphasize some adaptive orientations over others” (p. 62). Students employed different learning approaches, as made evident by their learning style differences, but found their way to the same end – different processes, same product. Educators should ask, “Are we providing experiences in classrooms that aid in the development of all students’ unique cognitive processes?”

In agricultural education, the findings of this study indicate that students can benefit from experiential learning approaches regardless of their learning style. Kolb (1984) explained that students have a preference, but that does not necessarily extend to the ability to perform tasks in various modes. It also was found that students’ motivation, which includes a measure of satisfaction, was not significantly different across various learning styles. This seems to refute
even the notion of preference for a mode. Though learning styles, as measured by the KLSI (Kolb, 1999), seem to exist, their effects on learning goals are irrelevant to student outcomes in this population. In agricultural education, focus on learning style should turn toward the framework as a guide to ensure students are exposed to the meta-cognitive process of all four modes of learning.

**Recommendations for Practice and Research**

1. Experiential learning is an effective method in addressing the needs of all types of learners. Students, regardless of their preferred learning style, can benefit and grow from all four modes of learning. Therefore, educators should use experiential learning frequently in the learning environment without fear of isolating a student’s preferred style of learning.

2. This study assessed learning style in the context of a classroom environment. However, agricultural education consists of multiple experiences across FFA and SAE activities (Baker et al., 2012). Although no differences were found in this study, future studies should assess the impact that KLSI has on students’ participation, or lack thereof, in FFA and SAE.

3. Although the study found that experiential learning improves students’ creative and practical skills effectively, and while direct instruction delivered analytical knowledge more effectively, a blended approach is recommended. As shared by Kolb (1984), the goal is a balanced development of all four learning modes and allowing each learner to both reside in their preferred mode and expand capacity in others.

4. Agricultural teacher education should include the discussion of the four teacher roles associated with meeting the needs of different learners. An awareness of learning style preference could facilitate better understanding and recruitment of all learning styles into the comprehensive agricultural education program, which might help develop the whole child (Dewey, 1938).

5. Further research could explore the relationship between the preferred teaching style of an agricultural educator and the learning style of the students recruited to the program. Could it be that recruiting efforts are hampered by a homogenous teaching style preference?

**References**


High School Graduation Success of Texas Students and the Value of Enrollment in Agricultural Education: Is Agricultural Education A Positive Influence?

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Abstract

High school graduation rates have been an ongoing concern in education since the early 1970s (Aud et. al., 2010). Describing differences in graduation rates between those students enrolled in agriculture courses and those who are not enrolled provides a lens through which agricultural education success and failure can be viewed. Career and technical education, including agricultural education, has long been seen as a way to integrate abstract concepts in an applied setting (Stone, 2007), leading to increased student understanding (Clark, Parr, Peake, & Flanders, 2012; Stone, 2011) and graduation rates (Heckman & LaFontaine, 2010). This study described the graduation rate of the 2010 cohort population in Texas, looking at differences in those enrolled in agriculture courses and those with no agricultural enrollment. Additionally, the study examined two factors related to graduation rate; disciplinary action and gifted classification. Findings of this study showed that students enrolled in an agricultural education course graduated at higher levels (91.9%) than those not enrolled (83.3%), and that an increased graduation rate could be observed with an increase in number of agriculture courses taken. Results also highlighted that students enrolled in more agriculture classes were less likely to be classified as gifted and less likely to have a disciplinary record.

Introduction

America is no longer the world leader in education (Heckman & LaFontaine, 2010). Student dropout rate is a concern in education, one that has been given widespread attention from both federal and state agencies. Multiple studies have been conducted to examine the factors contributing to student dropout and retention. In order to meet research priority 4 of the American Association for Agricultural Education (AAAE; Doerfert, 2011), and prepare “meaningful, engaged learning in all environments” (p. 21), stakeholders in agricultural education must ensure that those students enrolling in agriculture courses are persisting through high school through graduation. To accurately describe the issue of high school graduation rates for agriculture students in Texas, graduation rates were identified and compared to graduation rates for those not enrolled in agriculture courses.

Graduation rates in the United States have shown a steady increase since 2001 (Aud et. al., 2010). Although increasing graduation rates point to a positive change in secondary education as a whole, the National Center for Educational Research (Aud et. al., 2010) reported a national graduation rate of 73.9% for the graduating class of 2007. Increasing the high school graduation rate is imperative to the global success of the United States, as more and more countries surpass the United States in educational quality (Heckman & LaFontaine, 2010).
According to Swanson (2004), the factors having the largest impact on graduation rate are gifted and talented classification and having a high school disciplinary record. Results have illustrated that students who are classified as gifted and talented have a much higher graduation rate than students who are not classified as gifted and talented (Swanson, 2004). On the other end of the graduation factors of impact, students with a disciplinary record are much more likely to drop out of school and not persist through graduation (Reynolds et. al., 2008). Examining these factors may allow for a better view of the types of students enrolling in agricultural education, and their potential for successfully graduating.

Concerns have been expressed that many students, including at-risk and low achievers, may have difficulty understanding abstract academic concepts when taught in standalone courses (Boaler, 1998; Kieran, 1992; Woodward & Montague, 2002). The abstract nature of academic concepts has been cited as a possible barrier to gaining understanding for all students (Stone, 2011; Woodward & Montague, 2002). A decrease in understanding may lead to student frustration and failure, both contributing factors to student dropout (Heckman & LaFontaine, 2010; Janosz, LeBlanc, Boulerice & Tremblay, 1997; Swanson, 2004). Career and Technical Education (CTE) courses, including agricultural education, have been proposed as a solution to delivering abstract concepts in an applied context, which has been shown to increase student understanding (Clark, Parr, Peake, & Flanders, 2012; Stone, 2011).

State agencies have begun to mandate testing of core academic subjects in agriculture courses (Myers & Dyer, 2004), which will have implications for students in agricultural education courses. According to Thompson & Warnick (2007), graduation requirements and external pressures for accountability have increased in agricultural education, and greater attention has been given to the integration of academic subjects. In recent years, agriculture teachers have been called upon to teach curricula with greater emphasis on academic content (Parr, Edwards, & Leising, 2006). Myers and Dyer (2004) identified that agricultural teachers often are called upon to integrate curriculum standards in science, mathematics, and other content areas.

Several researchers have suggested that academic performance and achievement is influenced by agricultural education. Phipps, Osborne, Dyer, and Ball (2008) stated that agricultural education in secondary schools has an important role in enhancing student achievement in the core subject areas. Enderlin and Osborne (1992) also reported that agricultural students received higher test scores in biology than students in other science classes. It seems that agricultural education plays a role in and offers potential for academic success. The programmatic approach to learning, integrated with concepts of experiential learning are a possible reason for increases in academic performance related to agricultural education enrollment (Knobloch, 2003).

**Theoretical Framework**

This study was grounded in social cognitive theory (Bandura, 1986), as shown in Figure 1. Bandura noted that human interactions are based on the dynamic triadic interaction between factors in three areas: personal determinants, behavioral determinants, and environmental determinants. Vallarand, Fortier, and Guay (1997) proposed a model of high-school dropout deeply rooted in the foundations of Bandura’s (1986) social cognitive theory. Their testing of this model led them to support the laurels of social cognitive theory as the foundation for determining high school drop-out.
Research has shown that personal determinants such as parent education level, socio-economic status, gender, and ethnicity may have some impact on individual high school retention (Astone & McLanahan, 1996; Ensminger & Slusarcick, 1992). Although it is known that personal determinants have an influence on graduation rate, the focus of this study included only the personal determinants of gifted and talented classification and disciplinary record. The research objectives of this study examined the interaction between the behavioral determinant of high school completion, the environmental determinant of enrollment in agriculture courses, and the personal determinants of gifted and talented status and disciplinary record.

Previous studies have shown enrollment in an agriculture course to be a factor in increasing student performance in individual core concepts (Clark, Parr, Peake, & Flanders, 2012; Myers & Dyer, 2006; Ricketts, Duncan & Peake, 2006). By focusing on students who have enrolled in agriculture courses and examining their graduation rates, a parallel may be drawn to investigate the interaction of enrollment to the behavior of high school completion.

Two specific aims guided the development and analysis of this study. First, the relationship between enrollment in an agriculture course and high school graduation was to be examined. Second, the study sought to identify the influence of amount of agriculture course exposure on graduation rates.

**Purpose and Objectives**

The purpose of this study was to describe the high school graduation rate of students in Texas who were enrolled in agriculture courses, and examine the relationship between number of agriculture courses taken and graduation rate. To fulfill this purpose, the following objectives guided this study:

1. Describe the high school graduation rate of 2010 high school senior students in Texas.
2. Describe the graduation rate of students enrolled in two, four and six semesters of agriculture courses.

3. Determine if relationships exist between enrollment in agriculture courses and graduation rate.

3. Describe number of disciplinary actions and taken against students both enrolled and not enrolled in agriculture courses.

4. Describe the percentage of gifted and talented students in the population, and enrolled in agriculture courses.

Methods

This descriptive census study analyzed N = 305,988 students attending schools where agriculture courses were offered in Texas who remained in the educational system in Texas continuously from 8th grade until high school graduation in 2010. This group of students is classified as a “cohort group” by the Texas Education Agency and does not include students who transfer in or out of the Texas educational system at any point between 8th grade and an expected graduation date of 2010. The use of a cohort group provides a method to track only those students who were present in the Texas educational system for middle and high school. Students were identified through the Texas Educational Agency and data were provided to researchers by the Public Educational Information Management System (PEIMS).

Specific data from the cohort group included in this analysis included student graduation status, ethnicity, gifted and talented status, and disciplinary record. Data were managed in MS Excel© and utilized IBM© SPSS© for parametric analysis.

This study was conducted under planned research methods and analysis, however certain limitations exist. First, the nature of gifted and talented classification and disciplinary action were not well qualified in PEIMS data, and caution must be taken in interpreting the meanings of these terms. Second, although research has shown that demographic factors like parent education level, socio-economic status, and gender are possible factors of influence on graduation rate, they were not examined in relation to their proportional representation in the agriculture student and total population. A final limitation lies in the fact that data were not available for students who were only enrolled in a single semester of agriculture courses, therefore, those students cannot be separated for analysis.

Subject Characteristics

Demographic characteristics of the population are described in Table 1. The data indicates that the majority of graduates in the 2010 cohort were Hispanic/Latino (n = 131,570), followed by White (n = 106,632), and Black/African American (n = 40,987).
Table 1
*Ethnicity of 2010 Cohort Students (N = 305,988)*

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian or Alaskan Native</td>
<td>1,355</td>
<td>0.4</td>
</tr>
<tr>
<td>Asian</td>
<td>9,005</td>
<td>2.9</td>
</tr>
<tr>
<td>Black or African American</td>
<td>40,987</td>
<td>13.4</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>131,570</td>
<td>43.0</td>
</tr>
<tr>
<td>Native Hawaiian/Other Pacific</td>
<td>285</td>
<td>.1</td>
</tr>
<tr>
<td>Two or more races</td>
<td>3,577</td>
<td>1.2</td>
</tr>
<tr>
<td>Unidentified</td>
<td>12,577</td>
<td>4.1</td>
</tr>
<tr>
<td>White</td>
<td>106,632</td>
<td>34.8</td>
</tr>
<tr>
<td>Total</td>
<td>305,988</td>
<td>100.0</td>
</tr>
</tbody>
</table>

With regard to students who were enrolled in at least two agriculture courses (n = 42,598), ethnicity percentages were slightly different. The breakdown of ethnicities available for students in the 2010 cohort who were enrolled in agriculture classes is shown in Table 2. White students made up 57.3% (n = 24,399) of the agriculture students, followed by Hispanic/Latino (n = 12,991, 30.5%), and Black/African American (n = 3,339, 7.8%).

Table 2
*Ethnicity of 2010 Cohort Students Enrolled in Agriculture Courses (n = 42,598)*

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian or Alaskan Native</td>
<td>201</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Asian</td>
<td>234</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Black or African American</td>
<td>3,339</td>
<td>7.8</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>12,991</td>
<td>30.5</td>
</tr>
<tr>
<td>Native Hawaiian/Other Pacific</td>
<td>5</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Two or more races</td>
<td>470</td>
<td>1.1</td>
</tr>
<tr>
<td>Unidentified</td>
<td>959</td>
<td>2.3</td>
</tr>
<tr>
<td>White</td>
<td>24,399</td>
<td>57.3</td>
</tr>
</tbody>
</table>

Findings

The first objective of this study was to describe the graduation rate of students in the 2010 cohort group. In this population (N = 305,988), 83.3% (n = 254,878) of students were reported as completing the requirements for high school completion and graduating in 2010, as shown in Table 3.

Table 3
*Graduation Status of 2010 Cohort Population (N = 305,988)*

<table>
<thead>
<tr>
<th>Graduation Status</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduated</td>
<td>254,878</td>
<td>83.3</td>
</tr>
<tr>
<td>Did not graduate</td>
<td>51,110</td>
<td>16.7</td>
</tr>
</tbody>
</table>
Research objective two was to identify the graduation percentage of students in the 2010 cohort group who had taken agriculture classes for two or more semesters. To determine this, student enrollment was classified into those who participated in zero, two, four, or six semesters of agriculture classes. In terms of involvement in two or more semesters of agricultural education class, 14% of this cohort group (n = 42,598) reported enrollment in agricultural education courses with 86.1% (n = 263,390) reporting less than two semesters of enrollment. Experience in agricultural education declines as students records indicated enrollment in four (6%) or six (3%) semesters of agriculture courses. While the sharp decline in enrollment by number of semesters may cause concern for analysis, the number of students at each level of enrollment warrants continued examination. An analysis of student enrollment in agriculture courses is illustrated in Table 4. A limitation to this study is that those students having only one semester of agricultural education were not included in the information obtained for the cohort, as such, students enrolled in only one semester were not as a portion of the analysis.

Table 4
Enrollment in Agriculture Courses by Number of Semesters (N = 305,988)

<table>
<thead>
<tr>
<th></th>
<th>&gt;2 semesters</th>
<th>2-3 semesters</th>
<th>4-5 semesters</th>
<th>&gt;5 semesters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students Enrolled</td>
<td>263,390</td>
<td>42,598</td>
<td>18,517</td>
<td>9,057</td>
</tr>
<tr>
<td>f</td>
<td>%</td>
<td>f</td>
<td>f</td>
<td>f</td>
</tr>
<tr>
<td></td>
<td>86.1</td>
<td>13.9</td>
<td>6.1</td>
<td>3.0</td>
</tr>
</tbody>
</table>

After determining the number of students enrolled in agricultural education classes by number of semesters, the graduation rate for students was analyzed in relation to the number of agriculture courses taken. Results of this analysis are shown in Table 5. Graduation rate was shown to increase with an increase in number of agriculture courses taken. It is interesting to note, the percentage of students graduating who had taken at least six semesters of agriculture courses had a graduation rate almost 15% higher than the entire population.

Table 5
Graduation Rate of Total Cohort Compared to Graduation Rate by Number of Agriculture Courses Taken (N = 305,988)

<table>
<thead>
<tr>
<th>Agriculture course enrollment</th>
<th>Cohort</th>
<th>2-3 semesters</th>
<th>4-5 semesters</th>
<th>&gt;5 semesters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>f</td>
<td>f</td>
<td>f</td>
</tr>
<tr>
<td>Not Graduated</td>
<td>51,110</td>
<td>3,464</td>
<td>832</td>
<td>211</td>
</tr>
<tr>
<td>Graduated</td>
<td>254,878</td>
<td>39,134</td>
<td>17,685</td>
<td>8,846</td>
</tr>
<tr>
<td>Total</td>
<td>305,988</td>
<td>42,598</td>
<td>18,517</td>
<td>9,057</td>
</tr>
</tbody>
</table>

The third objective of this research study was to determine the relationships which exist between graduation rate and enrollment in agricultural education courses. To address research objective three, a Chi-square test of independence was used to determine if the variables graduation rate and agriculture courses taken were independent. The calculated chi-square was significant indicating that the variables were not independent of each other. The association between the two variables revealed a greater percent of students who had taken agriculture courses graduating from high school (91.9%) than students who were not enrolled in 2 or more semesters of agriculture courses (81.9%). In this 2x2 Chi square test, Cramer’s Phi was calculated to estimate the effect size of the interaction (Cohen, 1988), resulting in φ = 0.21. According to Rea
and Parker (1992), a Cramer’s Phi score between 0.20 and 0.40 is considered a moderate effect size. The results of the Chi-square analysis are shown in Table 6.

Table 6
Chi-Square Analysis of Graduation Rate and Enrollment in Agricultural Education Classes

<table>
<thead>
<tr>
<th>Graduate</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;1 semester of agriculture courses taken</td>
<td>215,744</td>
<td>47,646</td>
</tr>
<tr>
<td></td>
<td>(81.9%)</td>
<td>(18.1%)</td>
</tr>
<tr>
<td>1 or less semesters of agriculture courses taken</td>
<td>39,134</td>
<td>3,464</td>
</tr>
<tr>
<td></td>
<td>(91.9%)</td>
<td>(8.1%)</td>
</tr>
<tr>
<td>Totals</td>
<td>n = 254,878</td>
<td>n = 51,110</td>
</tr>
<tr>
<td></td>
<td>(83.3%)</td>
<td>(16.7%)</td>
</tr>
</tbody>
</table>

Note. $\chi^2 (1, N = 305,988) = 2613.19, p = .001$

The aim of research objective four was to describe the number of disciplinary actions taken against students in the total population and those who were enrolled in varying semesters of agriculture classes. The frequencies and percentages for student disciplinary record are shown in Table 7.

Table 7
Disciplinary Actions Recorded for Cohort by Involvement in Agriculture Course

<table>
<thead>
<tr>
<th>Agriculture course enrollment</th>
<th>Cohort</th>
<th>2-3 semesters</th>
<th>4-5 semesters</th>
<th>&gt;5 semesters</th>
</tr>
</thead>
<tbody>
<tr>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>No record</td>
<td>156,002</td>
<td>51.0</td>
<td>21,172</td>
<td>49.7</td>
</tr>
<tr>
<td>Disciplinary Record</td>
<td>149,986</td>
<td>49.0</td>
<td>21,426</td>
<td>50.3</td>
</tr>
<tr>
<td>Total</td>
<td>305,988</td>
<td>100.0</td>
<td>42,598</td>
<td>100.0</td>
</tr>
</tbody>
</table>

In terms of disciplinary records, 49.0% of students in the 2010 cohort had a disciplinary record. Agricultural education students enrolled for two-semesters actually report a disciplinary record percentage greater than that of the overall population (50.3%), while those enrolling in four to six semesters of agriculture report lower disciplinary records than the population.

The final research objective guiding this study was to identify the percentage of students who were categorized as gifted and talented, in both the cohort population and those enrolled in agriculture courses. Only 9.2% of the 2010 cohort group was categorized in the gifted and talented classification. Gifted and talented students represent a small percentage of agricultural education students. In students who took more agriculture courses, the proportion of gifted and talented students was larger. Students categorized as gifted and talented and enrolled in two semesters of agriculture education represent only 5.7% of the student population in this area. Students enrolled in more than two semesters make up a larger portion of the total group (6.7% and 7.3% respectively).

A summary of these results are listed in Table 8.
Table 8
Gifted and Talented Classification for Cohort Group by Involvement in Agriculture Courses

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Agriculture course enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2-3 semesters</td>
</tr>
<tr>
<td></td>
<td>f</td>
</tr>
<tr>
<td>Gifted</td>
<td>28,269</td>
</tr>
<tr>
<td>Not Gifted</td>
<td>265,142</td>
</tr>
<tr>
<td>Not Reported</td>
<td>12,577</td>
</tr>
<tr>
<td>Total</td>
<td>305,988</td>
</tr>
</tbody>
</table>

Note. Due to rounding, not all values total 100%

Conclusions/Implications/Recommendations

Findings of this study support the statement that those students in Texas enrolled in agricultural education courses graduated at a higher rate than those who did not take an agriculture course. Related to the theoretical framework, it can be determined that there is a dynamic interaction between the three determinant areas.

Students who are enrolled in agriculture classes have higher graduation rates, and a significant difference exists between enrollment in agriculture classes and graduation. Related to behavioral determinants, there appears to be a relationship with both graduation rate and enrollment in an agriculture class. With regard to the environmental determinant of enrolling an agriculture class, there is a distinct interaction with both student personal factors and graduation success.

With regard to demographic characteristics, it is interesting to note the differences in ethnicity from the total cohort group to those enrolled in agriculture courses. Although differences in demographics was not a stated objective of this study, several interesting findings related to ethnicity of students emerged and warrant discussion.

This study illustrated that although Hispanic/Latino students made up the largest ethnic group statewide (43.0%), White students made up the largest ethnic group (57.3%) when considering only those students enrolled in 2 more semesters of agriculture classes. This result is parallel to other studies in agricultural education that illuminate the need for increased minority representation (Elliott, 2014; Luft, 1996; Roberts et al, 2009). It is recommended that continued research be conducted into possible reasons that Hispanic/Latino students are underrepresented in agricultural education, and methods for engaging minority student at proportional levels.

Another discrepancy in representation is seen in the number of Black/African American students enrolled in agriculture courses. The statewide cohort population had 13.4% Black/African American students, almost double the number of Black/African American students enrolled in agriculture courses (7.8%). Research into the underrepresented portion of these students should be examined to help diversify agricultural education in Texas, and increase the proportional enrollment of students from all ethnic backgrounds.

Related to the stated research objectives, we can conclude that students who are enrolled in agriculture courses in Texas are in fact graduating at higher rates than those not enrolled. This
has implications for the profession as a whole, although care should be taken in attributing graduation rates solely to agricultural education enrollment.

There are several possible explanations for this result. The possibility exists that agriculture courses attract students who are more likely to graduate, and would graduate at higher rates even without enrolling in agriculture courses. Additional explanation for the increase in graduation rate could be due to the differences in ethnic makeup from the cohort population to the students enrolled in agriculture courses. Known differences exist in graduation rate by ethnic group. However, when controlling only for students taking agriculture courses, enrolling in an agricultural course was found to be a significant factor in graduation rate. Further research is needed to determine the impact of ethnicity in graduation rates among students enrolled in agriculture classes.

Another possible reason for the increased graduation rate among those who enroll in agriculture courses is that by applying abstract concepts in applied settings, students in agricultural education are able to find success and therefore less likely to leave high school before graduation. Both of these possibilities show great promise for the future of agricultural education. This conclusion is bolstered by the fact that students who were enrolled in more agriculture classes had increasing graduation rates. It is recommended to take steps in understanding the possible causes for increased graduation rate with increased numbers of agriculture courses taken.

Related to disciplinary action, students enrolled in two semesters of agriculture courses have higher percentages of disciplinary records than the population group. This could be due to early enrollment of students who are historically lower achieving in CTE courses. The apparent inequality becomes equalized with more exposure to agriculture courses, and students having four or more semesters of enrollment have lower percentages of disciplinary records than the population. It is important to note that the data collected for this study did not differentiate between types of disciplinary action taken, or severity of offenses, and care should be taken in assumptions about the nature of the offense. Recommendations related to disciplinary action include conducting a comprehensive study into the influence that enrolling in an agriculture course has on students with prior disciplinary offenses.

In examining the graduation influence factor of gifted and talented students, it is comforting to know that agricultural education courses are attracting some high achieving students, even in those students who require more academic commitment. Thompson and Warnick (2007) found that increased graduation requirements had an impact on student enrollment in agriculture courses. The results of this study support that notion, as only 5.8% of students enrolling in agricultural education courses were classified as gifted and talented.

Although the low proportion of gifted students could be seen as a possible drawback, it also means that agriculture courses are serving a large number of students who are not high achieving. This could mean that the applied concepts in agriculture courses have the ability to reach out to students who might not be able to understand core academic concepts taught in other courses. It is recommended that research be developed to help understand the performance and relationship between student achievement level and actual student achievement in agriculture courses.
Additionally, it is suggested to replicate this study longitudinally and on a broader scale to determine if the results are generalizable to the national population of agriculture students. It is recommended that sampling techniques are used to initiate new research objectives and develop baseline success measures to not only determine values but develop longitudinal measures that identify true success.

References


Strangers at a Strange Convention: Urban FFA Members at the National FFA Convention

Michael J. Martin, Colorado State University
Tracy Kitchel, University of Missouri

Abstract

Urban FFA members face unique challenges if they want to become active members in the National FFA Organization. FFA leaders have realized that the FFA organization does not represent the evolving demographics of America and have made efforts to cater to urban and diverse high school audiences with some success. This study seeks to explore this phenomenon from the perspective of urban and diverse agriculture students through the use of a critical theory lens. This paper focuses on one group of urban FFA members and how they interpreted FFA culture while attending the National FFA Convention. The critical theory framework herein focuses on how these urban FFA members comprehended the FFA’s rural and production-oriented agricultural themes. The Harris FFA members had the cultural resiliency to internalize the different cultural values they experienced and personally connect with some pieces of the culture presented. These members overlooked or adapted to the rural, white, and traditional agriculture values of FFA; but, more importantly, they focused on the leadership and community development values of FFA.

Introduction

Urban FFA members face unique challenges if they want to become active members in the National FFA Organization. These challenges could stem from the context of the National FFA Organization. The National FFA Organization has nurtured their historical linkages to rural America (Martin & Kitchel, 2014). The context of rural America is quite different than urban America. First, urban centers are geographically unconnected to rural America, which is the traditional location for agriculture. The National FFA Organization has many activities focusing on production agriculture (e.g., livestock and grain production related activities or events), which is typically found in rural areas. While there are activities that apply to an urban context (e.g., veterinary science or agricultural research activities or events), these types of urban-focused activities are limited. Urban centers are also more ethnically, racially, and culturally diverse as compared to many rural communities. The agrarian themes present in rural traditions, including FFA, would possibly be alien to urban residents (Allen, 2004). For instance, the rural undertones present in the traditions (e.g., the themes present in the Creed and FFA Opening Ceremonies) and activities may seem foreign to urban students (Hoover, & Scanlon, 1991; Phelps, Henry, & Bird, 2012). These differences could lead to ideological disconnects between urban students and FFA.

Research on FFA diversity has revealed interesting findings related to member participation in FFA. Agriculture teachers have identified that diverse students lack role models in agricultural education (LaVergne, Larke, Elbert, & Jones, 2011) and FFA stakeholders have had to utilize interventions to increase the diverse members’ interest in participating in FFA (Roberts, Hall, Gill, Shinn, Larke, & Jaure, 2009). Teachers have also identified stereotypes as a barrier to diverse members’ FFA participation (Gliem & Gliem, 2000; Talbert & Larke, 1995; Warren & Alston, 2007). There may be some historical precedence for these negative views (Talbert,
Larke, & Jones, 1999), including the historical decline of African-Americans in FFA after the merger with New Farmers of America (NFA) (Wakefield & Talbert, 2003). The barriers urban FFA members’ face related to their context has also been researched. Urban FFA members’ local context and lack of production agriculture resources could be viewed as a disadvantage if compared to their rural FFA counterparts (Smith & Baggett, 2012). For instance, the State FFA Degree requires a significant amount of time and money earned while working in a supervised agricultural experience (National FFA Organization [FFA], 2009). The money and time requirement for the State FFA Degree can be very difficult for urban students as they may have after-school responsibilities (Weiss, Little, & Bouffard, 2005).

We are not saying all urban FFA programs or FFA programs with predominantly diverse members will not find success. The achievements of urban FFA programs in certain metropolitan centers around the country, like Chicago High School for Agricultural Sciences, provide examples of successful urban FFA chapters (Phipps, Osborne, Dyer, & Ball, 2008). Researchers have also profiled successful urban agriculture programs (Bird, Tummons, Martin, & Henry, 2013; Soloninka, 2003). Furthermore, a survey of urban agriculture students’ perceived barriers to FFA participation revealed no perceived barriers (Martin & Kitchel, 2014). However, the success of some urban FFA programs does not change the ideological disconnects which may exist for some urban FFA members. This issue may become important to the National FFA Organization as American society continues urbanize and diversify in the coming decades (Moule, 2011). FFA advisors and stakeholders need to develop a clearer concept of how FFA culturally fits within the urban context.

FFA leaders have realized that the National FFA Organization may not represent the evolving demographics of America (FFA, 2014) and have made efforts to cater to urban and diverse high school audiences (LaVergne, Jones, Larke, & Elbert, 2012; Vincent & Torres, 2011) with some success. Some of the success has stemmed from intervention programs to increase minority participation in FFA (Roberts et. al., 2009). The prescribed interventions focused on emphasizing the opportunities of the organization to urban and diverse students. The interventions did not explore how local FFA leaders can adapt the FFA programs to match the needs of diverse students. Furthermore, few researchers have examined the possible barriers of the FFA for diverse students’ participating in FFA (LaVergne et al., 2012; Martin & Kitchel, 2014). This study seeks to explore this phenomenon from the perspective of urban and diverse agriculture students through the use of a critical theory lens.

Previous research on youth organizations and critical theory provides some initial insight on this mismatching of FFA ideals with the urban/minority population’s nonagricultural reality. Simply stated, if a student does not feel like they belong or cannot relate to a group, then they will not participate (Larson, 1994). Students’ perception of the cultural fit within an organization influences their decision to participate (Borden, Perkins, Villarruel, & Stone, 2005; Harvard Family Research Project, 2004). For example, Asian and Pacific Island youth in Sacramento were experiencing racial prejudice from some of the city’s residents who had developed misconceptions because of the crime in their communities. A group of concerned youth formed an organization to change these misconceptions. The members of the organization worked to keep youth out of prison and combat the public perception of youth as criminals (Kwon, 2006). The work of this youth organization helped change the perception many had in Sacramento about Asian and Pacific Island youth. Researchers indicate that this Sacramento youth organization
was successful because it directly tied into the needs and culture of urban youth. The significance of culture on urban youths’ decision to participate in FFA is critical when considering FFA’s traditional agriculture and rural heritage themes.

**Purpose of the Critical Inquiry**

The purpose of this critical inquiry was to explore urban FFA members’ interpretations of the culture of FFA while attending the 2012 National FFA Convention. The framework of critical theory focused our analysis on how the urban FFA members comprehended the rural and production-oriented agricultural themes of FFA. This study aligned to Priority Area #5 (Efficient and Effective Agricultural Education Programs) of the American Association for Agricultural Education’s (AAAE) National Research Agenda by exploring how urban FFA members find a fit in the culture of FFA (Doerfert, 2011).

**Conceptual Framework of Critical Theory**

Critical theory in education emerged into predominance with the work of Paulo Freire. His internationally acclaimed books, Pedagogy of the Oppressed (2003) and Education for Critical Consciousness (1973) argued for an education focused on social justice. Schools and educational programs could be places for reproducing the social inequities of society or places for liberation from oppression. Freire believed in the latter vision for schools. The dialogue between those who perpetuate the social inequalities (the oppressors) and the people who are targets of social inequalities (the oppressed) is crucial. Freire argued that both groups are victims of social inequality because the oppressor loses their humanity when they oppress. Thus, critical pedagogy must involve everyone in school or educational programs to ensure that social justice can help alleviate the inequalities of society.

Contemporary researchers have built upon Freire’s call for critical pedagogy, which is an application of critical theory (Kincheloe, 2008). Schools and educational programs often reinforce the negative social stratification of America, and educators must actively work against this stratification to ensure social equality and justice (Giroux, 1981; Kilncheloe, 1991; Kincheloe & MacLaren, 2008). A key concept in critical pedagogy research is the hegemony of a school or educational program. Hegemony refers to the organized meaning of the dominate thoughts, values, and actions of a group (Apple, 2004; Giroux, 1981). While there can be multiple forms and levels of hegemony in a given group, educationalists usually discuss only the dominate hegemony of a school or educational group. Dominate hegemony would be the written and unwritten rules which govern the actions and norms of the whole group. Hegemony can be difficult to interpret because it is rarely articulated in daily life. For instance, Americans are rarely told that our capitalist economy requires us to spend money on consumer items. Researchers and practitioners often examine how the hegemony is enforced and reproduced to understand better the hegemony itself. This process of enforcement and reproduction is referred to as ideology. So, going back to the previous example, the capitalistic hegemony of America is revealed through the consumer driven nature of our media (i.e., commercial and advertisement driven). Researchers and practitioners often focus on the ideologies because these forces are easier to identify and describe as compared to hegemony.
Michael Apple (1982, 2004) provided some key concepts for understanding how hegemony and ideology functions in a school system. Ideology can be revealed overtly or covertly. For example, a teacher who has a sign posted, mandating that students must not talk to their neighbors during study is enforcing a teacher-centered view of teaching. Ideology is also often reinforced covertly. For instance, the result of a teacher placing chairs in a circle would be students having more physical opportunities to interact with each other, which would be a student-centered approach. Ideologies should be viewed as a natural consequence of any group; however, ideologies should be examined to understand the effect it has on people in that group. Ideologies are the tools of critical pedagogy researchers and are used to understand how schools and education programs either breakdown or reinforce the inequitable hegemonies in American society.

While no researcher has viewed FFA directly from a critical pedagogy framework, previous research indicates an ideology at play. In short, the ideology of FFA tends to be White, rural, and traditional agriculture (Hoover & Scanlon, 1991; Lawrence, Rayfield, Moore, & Outley, 2013; Phelps, Henry, & Bird, 2012; Wakefield & Talbert, 2003). Furthermore, Martin and Kitchel (2013) indicated the traditions of FFA, which are grounded in agrarian traditions, would indicate the presence of overt and covert ideologies in FFA. An implication from this study was that diverse and urban students may be alienated by this hegemony as represented by a hidden curriculum of FFA traditions. The National FFA Organization understands that there is a need to investigate these issues (FFA, 2014). More research is needed to identify how the hegemony of FFA might influence urban agriculture students’ decision to participate in FFA. We want to reiterate that these components represent a natural process of social systems and are not inherently bad. Nonetheless, The National FFA Organization, as an educational system needs to be examined through a critical theory lens to explore the ideology of FFA and ensure all FFA members can benefit from participation in the organization.

**Critical Theory Methods**

Critical theory research questions the dominant ideology of social groups and seeks to empower people who are alienated by that dominate ideology (Guba & Lincoln, 2005; Kihlnceloe, 1991). We wanted to uncover the ideological forces influencing the participation of urban FFA members. The interpretations of urban FFA members were central to the problem being studied. The urban FFA members were outside of the dominant ideology of FFA (i.e., rural and agriculturally centered) and their views of FFA would naturally be different than rural FFA members. The authors’ role as insiders in FFA helped build the framework for this study. However, as former FFA members and FFA advisors, our viewpoints can only provide context to the urban FFA experience and are not intended to serve as a substitute for how the urban FFA members responded to their experiences at the National FFA Convention. It’s the urban members’ input that provides the core of this study.

This study involved the FFA members of Harris High School. Harris High School is a magnet school set in the center of the metropolitan area of Sharpsburg, which has over 2.5 million residents including the surrounding area. The school had two agriculture teachers with their own curriculum pathways: veterinary science, taught by Mrs. Hansen, and horticulture, which was taught by Ms. Warner. Both teachers were White and female. Only FFA members attending the National FFA Convention were included in this study. Seventeen FFA members from Harris
attended the convention and 15 of those members were part of this study. The student demographics of the group were 10 Caucasians, three African-Americans, one Hispanic, and one bi-racial member. The group consisted of 14 females and one male. The members had limited experience in traditional production agriculture or rural culture. Two of the senior FFA member had attended the 2011 National FFA Convention the previous year; however, most of the members going to the Convention had attended only one FFA event beyond the local level. The following table outlines the characteristics of the Harris FFA members studied.

<table>
<thead>
<tr>
<th>Name</th>
<th>Grade</th>
<th>Gender</th>
<th>Race/Ethnicity</th>
<th>Teacher</th>
<th>Convention Returner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary</td>
<td>Junior</td>
<td>Female</td>
<td>Caucasian</td>
<td>Mrs. Hansen</td>
<td>No</td>
</tr>
<tr>
<td>Brittany</td>
<td>Junior</td>
<td>Female</td>
<td>Caucasian</td>
<td>Mrs. Hansen</td>
<td>No</td>
</tr>
<tr>
<td>Barbara</td>
<td>Junior</td>
<td>Female</td>
<td>Caucasian</td>
<td>Mrs. Hansen</td>
<td>No</td>
</tr>
<tr>
<td>Lisa</td>
<td>Senior</td>
<td>Female</td>
<td>Caucasian</td>
<td>Mrs. Hansen</td>
<td>No</td>
</tr>
<tr>
<td>Savannah</td>
<td>Junior</td>
<td>Female</td>
<td>Caucasian</td>
<td>Mrs. Hansen</td>
<td>No</td>
</tr>
<tr>
<td>Tasha</td>
<td>Junior</td>
<td>Female</td>
<td>Caucasian</td>
<td>Mrs. Hansen</td>
<td>No</td>
</tr>
<tr>
<td>Ruth</td>
<td>Senior</td>
<td>Female</td>
<td>Caucasian</td>
<td>Mrs. Hansen</td>
<td>No</td>
</tr>
<tr>
<td>Helen</td>
<td>Senior</td>
<td>Female</td>
<td>Caucasian</td>
<td>Mrs. Hansen</td>
<td>Yes</td>
</tr>
<tr>
<td>Janet</td>
<td>Senior</td>
<td>Female</td>
<td>Caucasian</td>
<td>Mrs. Hansen</td>
<td>Yes</td>
</tr>
<tr>
<td>Shirley</td>
<td>Senior</td>
<td>Female</td>
<td>Caucasian</td>
<td>Mrs. Hansen</td>
<td>Yes</td>
</tr>
<tr>
<td>Peggy</td>
<td>Senior</td>
<td>Female</td>
<td>Bi-Racial</td>
<td>Mrs. Hansen</td>
<td>Yes</td>
</tr>
<tr>
<td>Martha</td>
<td>Junior</td>
<td>Female</td>
<td>African-American</td>
<td>Mrs. Hansen</td>
<td>No</td>
</tr>
<tr>
<td>Debra</td>
<td>Senior</td>
<td>Female</td>
<td>African-American</td>
<td>Ms. Warner</td>
<td>Yes</td>
</tr>
<tr>
<td>Tina</td>
<td>Senior</td>
<td>Female</td>
<td>African-American</td>
<td>Ms. Warner</td>
<td>Yes</td>
</tr>
<tr>
<td>José</td>
<td>Senior</td>
<td>Male</td>
<td>Hispanic</td>
<td>Ms. Warner</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Data were collected during the National FFA Convention. We conducted five focus groups with the Harris FFA members over two evenings. The discussion revolved around what the students saw, heard, learned, and thought based on the experiences of the previous day. The focus groups ranged from 15 minutes to over 30 minutes in length. We observed the members six times during the Convention. These observations occurred during the Career Show, Opening Session of the Convention Sessions, and leadership workshop. We followed small groups of students throughout these events, which could last from 45 minutes to 2 hours.

The data analysis process focused on finding and articulating the ideological forces of FFA within the experiences of the Harris FFA Members. The critical theory framework helped us interpret the transcripts regarding how these ideological forces might appear in the narratives. We highlighted passages in the data where members’ experienced isolation, unease, or alienation. We arranged the highlighted passages according to the themes which emerged, including race, accents, etc. The next step was to articulate how members’ feelings of isolation, unease, or alienation fit into the larger perspective of FFA ideology. The final step of the
research analysis was to reread the highlighted transcripts to find more instances which might reaffirm or deny our findings.

The standards for trustworthiness are complex for critical inquiry. Cortical inquiry arose because standard methods of research (i.e., quantitative, post-positivist, etc.) could not explain the lived experiences of marginalized groups. Thus, critical inquiry studies require alternative modes for maintaining trustworthiness. Member’s voice and positionality of truth in analysis are central in critical inquiry. We had to ensure that the voice of the Harris FFA members was central to our findings. The exclusion and or subordination of their voice would marginalize their experiences. We had to work to develop the positionality of truth of judgments. We did this by providing explanations, details, observations, and member quotes (Lincoln, 1995).

**Results from the Critical Inquiry**

The urban FFA members saw things at the National FFA Convention, which were culturally different than to what they were accustomed. The Harris FFA Chapter members were accustomed to being in multicultural and ethnic crowds. However, this is not what we witnessed at the Convention. The results section was divided into four parts: the three cultural disconnects experienced by the Harris FFA members (few people of color; Southern, rural accents; and rural traditions) and their attempt to assimilate or fit into the dominate FFA culture presented at convention.

**Few People of Color**

The FFA members in attendance were overwhelmingly White. It can be likened to a sea of black pants/skirts and corduroy blue jackets with White faces emerging from almost every jacket. A White FFA member can become anonymous at the height of the Career Show crowd. Everyone can start to look the same, except when the face emerging out of the blue corduroy jacket is of color. They appear as anomalies that stick out from the crowd. You immediately recognize that FFA members of color are different from the crowd, and the Harris FFA members of color pointed this out. Tina, one of the two African-American members from Harris, became visibly excited when she saw another cluster of black FFA members at the Career Expo. She pointed and whispered something to the other African-American member from Harris at the convention. At this moment she realized she was really a minority at the Career Show. Tina would later say in a focus group, “It’s like everywhere I turned someone was White.” She recognized that students of color were a real minority in this setting.

Debra, another African-American member, had similar feelings during her first day at the Career Show. Debra and Tina were trying to obtain autographs from FFA members from different states. Mrs. Hansen and Ms. Warner, the FFA advisors, were awarding prizes to Harris FFA members who obtained a signature from a FFA member from each state. Debra and Tina were motivated by this challenge. They frequently stopped members and asked where they were from or walked around members to read what state they were from, since each member’s home state was embroidered on the back of their FFA jacket. Debra reported white FFA members giving her and Tina “weird looks” and acting nervous:

Tina: Some of them didn’t even like to talk. They were just ah.
Debra: They’ve got different accents and some were just jittery…and some of them just don’t care.

Martin [moderator]: You said most of them seem kind of jittery?

Debra: Yes.

Debra and Tina did not report any of the FFA members they interacted with as being overtly rude to them. Their actions of asking random FFA members for signatures also may have caused nervous reactions. Nonetheless, they both reported feeling racially isolated as two African-American females at the Career Show.

José, the sole Hispanic member from Harris, had a similar experience when he found a fellow Cuban-American FFA member. He spotted her walking down the Career Expo aisle and claimed to know she was Cuban by looking at her. He spent some time talking to her. José had gone to the 2011 National FFA Convention and this was the first time he had meet another Cuban-American FFA member. The members talked about the meeting during the focus group at the end of the day:

Martha: Tell him about the Cuban thing.

Martin [moderator]: You can go ahead. Yes, tell us about the Cuban girl.

José: I met this girl. She’s Cuban and she was also Nicaraguan which is my special blend.

Martin: Did you talk to her at all or no?

José: Yes, yes. I actually did.

Martin: How long did you talk to her?

José: A minute.

Martin: A minute?

José: Yes. We had to both part ways, you know.

Martin: Where was she from?

José: Florida.

He understood this event to be rare and appreciated it. Skin color was an overt representation of the dominate ideology of FFA experienced by Harris FFA members. The vast majority of FFA members at the Convention were White and rural, which was not lost on the Harris FFA members. The White members from Harris also noticed something different.

**Southern, Rural Accents and Dialects**

The Harris FFA members heard accents that were strange to them. They interpreted these accents as being rural and Southern in dialect. Obviously, the Harris FFA members realized that not everyone had this specific accent; however, they believed that this accent was typical in the context of FFA. Shirley said, “You could tell the difference because if someone walked by and [they] have the southern accent, you could tell right way he was from the southern states.” Helen attempted to mimic the accent she had heard, “Some of them talk like this (with a southern twang).”

Many of the members enjoyed hearing the dialects of many FFA members, yet they became conscious of their own accent. They described their accent as urban and distinctly different than many of the southern, rural accents they were hearing. Interestingly, some members had fun with the accents they were hearing, calling them “sexy”: 
Martin [moderator]: What did you notice about them, anything interesting?
Mary: Some of their accents.
Brittany: Their accents.
Lisa: They had really nice accents.
Mary: Very sexy.
Brittany: They talk like this [with a southern twang].

They were forced to think about their own dialect, as well. Some members realized they could positively affect their FFA counterparts with southern accents. Janet, a White FFA member from Harris, said, “We were probably coming off a little too strong, but I think if we are energetic we can help people be energetic too.” Sometimes these differences created feelings of uneasiness.

The differences in dialects lead some of the Harris FFA members to change how they talked to fit in with the southern and rural accents they were hearing. Debra mentioned this in a focus group exchange:

Martin [moderator]: You don’t want to talk the way you normally talk in front of them.
Debra: No
Martin: You’re nervous. You said you change your voice when you talk to other members?
Debra: Mmhmm (affirmative).
Martin: Okay. Do you think they say something or think something?
Barbara: We didn’t think so.
Martha: They won’t say nothing. I feel like they like your accent.
Tina: That’s the main thing somebody will say.
Debra: That’s a polite way of saying it.
Tina: You have very country accent.
José: You’ve got a very unique accent.
Tina: Yes.
Martin: Okay… do you feel a real dominance of ruralness here?
José: Ruralness? I think there is a bunch of rural kids here.
Martin: Really? Is it overbearing?
José: It’s not overbearing....
Martin: You think it’s cool?
José: Yes.
Martin: Why do you hide it then?
Debra: [Purposely speaking in slang] Because I’s going to come up ‘n they’ve got a country name. You’re like “oh yeah” and they like “ya’ll” and all of that. We cut our words up and they’re just slang.

Debra internalized the dominate ideology of dialects she had in her consciousness. She deemed her own accent as negative. However, this was more than just an issue with White FFA members. The majority of Harris FFA members were White and Debra did not change her accent for those FFA members. Thus, for Debra, the dominate ideology of accents centered on her perception of FFA as being rural and agrarian as well as White. The members’ discussions around accents highlighted the complexity of the dominate ideology of FFA and members’
ability to identify with that ideology. Many of the members were intrigued by the cultural differences they saw and heard. This intrigue was not always negative; however, they realized that were different from many of the other FFA members at convention.

**Rural Symbols**
Many of the White Harris FFA members described the cultural barriers they encountered at the convention as more of a rural and urban dichotomy. The rural traditions seen at the Convention became both overt and covert to the Harris FFA members. The long history of FFA in rural communities and emphasis on production agriculture was on display during the Convention’s Opening Session. The history and success of FFA are articulated and celebrated through rituals, like the FFA Opening Ceremony and speeches from leaders in the organization. The Opening Session features images and videos of rural settings and production agriculture on a jumbo screen. The overt rural overtones are hard to miss. The National FFA Officers are stationed next to agrarian artifacts, like a plow or ear of corn (FFA, 2009). However, the plow and ear of corn are covert symbol of rural life. Harris FFA members participated in many of these rituals, including the recitation of the FFA members’ part of the FFA Opening Session, which starts with the presiding officer asking, “FFA members, why are we?”

The FFA jacket also represented a covert part of FFA ideology. The jacket has been relevantly unchanged for over eighty years. The more decorated the jacket, the more covert the meaning and the more overt the disconnect between urban and rule students. The jacket has a larger FFA emblem patch on the reverse and a small patch on the front of the same emblem. The jacket also includes the FFA members’ home chapter and home state embroidered on the reverse. Many FFA members also had their name embroidered on the front of their jacket. Some FFA members did not have their name on their jackets for a variety of reasons. Furthermore, many FFA members displayed their prominent FFA awards on their jackets below their embroidered name (FFA, 2009). Thus, FFA members displayed their achievements in FFA through their jackets. The Harris FFA members had neither their names embroidered nor awards attached to the FFA jackets they wore. Some of the Harris FFA members talked about the FFA jackets they wore during a focus group.

Martin [moderator]: Still they have a name on their jacket. Does that mean something to you guys not having a name on your jacket?
Ruth: To me it doesn’t.
Martin: You see somebody with all those pins [FFA awards displayed on someone’s jacket], right. Does it get intimidating?
Savannah: I feel like we haven’t; we’re city people.
Ruth: We’ve only been in this program for two years.
Savannah: They’ve been in it all their life.
Mary: These kids have been doing it longer than we have or at least they have more social clubs.
Savannah: Since elementary and stuff.
Ruth: We’re city kids and it’s just like they’re doing so much.
Mary: They have more experience with farming, doing competitions and when we do it, it’s our first time and we can’t go out and look at something because we don’t have it.
Savannah: Yes. I also feel like I think maybe their school or maybe their population gives more support to the FFA, but when I was first a freshman in this school I had never even heard of FFA until my junior year.

These Harris FFA members were able to connect the FFA jackets they saw at the Convention to the traditional agriculture and rural opportunities of FFA and their own urban community’s lack of those same opportunities.

Lisa realized that FFA was an organization predominately in rural areas. She realized the traditions of FFA were entrenched in many of the rural members she met at the convention. “It’s been going for 85 years and if you have been doing this about ten years or so, from elementary on up, then you know where to go and what to do and what’s next....” Experiencing the FFA from elementary on up was not an option for the Harris FFA members. They could only be in FFA for two years because their agriculture program was just a two-year program. Many of the experiences that FFA members were talking about on stage were unattainable to them because of this time limitation. They could never obtain their State FFA Degree because that required three years of agriculture courses, which also precluded them from obtaining their American FFA Degree. Thus, they faced multiple barriers to fulfilling an “idealized” FFA experience, mainly restricted by context and time.

The rural and production agriculture themes did force members to connect their context to the ideology on display at convention. Tasha’s perspective focused on the practice of agriculture. “I think smaller towns and the country are more involved because if you live in a big city you don't really pay attention to what you can do for other people and agriculture.” The combination of rural agricultural practices and the FFA traditions in rural America formed a cultural barrier for the Harris FFA members. These differences required even the Harris FFA members to think about how they could overcome the rural-urban divide and connect with the FFA.

**Assimilating into FFA**

The Harris FFA members worked to assimilate themselves into the dominate culture they experienced at the convention. Their efforts to assimilate included members participating in overt symbolic activities, like members reciting parts of the FFA Opening Ceremonies. Some of the covert symbols of FFA caused concern for members, like the status of their FFA jacket. Nonetheless, all of the Harris FFA members claimed to feel more like FFA members than before they had gone to convention. The degree of their new connection to FFA varied according to their own context. For instance, José said, “Yeah, when people talk about the farm and rolling up hay, I just can't relate to that.” Every student had to wrestle with barriers like race and culture. The ideology of FFA as a whole was not easily transferable to their lives.

Nonetheless, the Harris FFA members strove to find ways around these barriers. They did this by picking apart the ideology of FFA and finding those ideas to which they could relate. Some members found a connection to FFA because they had learned about the importance of agriculture in America. This was a very overt message during the FFA Opening Session. Debra said, “I didn’t think agriculture was that important, but then I realized it is really important.” José replied similarly, “Like, the opening sessions, we had that talk about how much farmers feed people and [how] the amount of people who would've [been] farming have decreased over the years.” The importance of agriculture to America gave Harris FFA members something with which they could understand and agree. Furthermore, the message and image of FFA members
working to fight hunger in their community gave them a direct link to agriculture, FFA, and their own community. This higher cause was appealing to them.

The mission of providing food for America, another overt message during the FFA Opening Session, was also a large enough cause to get some of the Harris FFA chapter members to look over the cultural barriers they perceived in FFA. The cause of helping the hungry enabled the members to think about the leadership and community development aspects of the FFA. Janet said, “I definitely know that I belong in the FFA… I like to help other people.” Martha connected with the speaker during the opening session of convention that was homeless and food insecure. She said, “[I liked] How they help the girl from the South that was homeless and how they feed the hungry… We could actually go and help when people go help feed the homeless.” Almost all of the members echoed these sentiments. Thus, the Harris FFA members were willing to overcome both overt and covert cultural differences; yet, they did not identify with every portion of FFA. The members actively sought and tried to make sense of what FFA could mean to them and assimilate into the dominate ideology of FFA.

**Discussion**

This research highlighted the difficulties the Harris FFA members had when interacting with the overt and covert ideologies of the FFA. These include the predominance of white FFA members, FFA members’ accents, and FFA jackets. These challenges should not be overlooked and could form a real barrier to urban FFA members feeling like actual FFA members and wanting to participate in FFA. However, the Harris FFA members had the cultural resiliency to internalize the different ideological values they experienced at the National FFA Convention. They even personally connected with pieces of the overt messages presented at the convention. The Harris FFA members either overlooked or adapted to the rural, White, and traditional agriculture values of FFA which they witnessed (Lawrence, Rayfield, Moore, & Outley, 2013; Martin & Kitchel, 2013; Phelps, Henry, & Bird, 2012); but more importantly, they focused on the leadership and community development values of the FFA. This cultural adaptation was spurred on by the Harris FFA members’ belief in the need of American agriculture to feed people. Thus, the hegemony of FFA may not be a complete fit for urban FFA members, and these members will have to be able to apply the ideology of FFA to their urban context for them to get the most out of FFA participation. These results must be understood with an important caveat. These students wanted to go to the convention and were the most active members in their chapter. Nonetheless, even these “active” or interested urban FFA members experienced cultural barriers at the convention.

The implications of the research seem to counter but at times reaffirm the established tenets of critical theory and youth organizations. The rural values of FFA could have alienated the urban members (Borden et al., 2005; Harvard Research Project, 2004; Herrera & Arbreton, 2003). This was the case for most of the members as they experience some level of disconnect and fear. Nonetheless, the Harris FFA members found ways that their values could fit in with the mission and motto of the FFA. They felt passionate about the desire to develop youth and serve communities (FFA, 2009). The predominantly White, rural members at the convention were noticed by the Harris FFA members and influenced the Harris FFA members to change how they acted. This reality of the organization was not lost on the members. They did not suggest changing the status quo of FFA and were conscious of the history of FFA. Instead of demanding
change, the members were willing to make certain personal changes or overlook the predominance of White, rural members at the Convention to find a place in the FFA. The eagerness of youth to belong to organizations they think are important may encourage them to overlook important cultural differences. This implication is important for people starting or researching urban FFA chapters as they can leverage the leadership and community development aspects of FFA for their members. This implication is also important for researchers in the critical fields as youth identity can be circumvented for larger social causes.

The recommendations that emerged from this study build upon the arguments of critical theory (Apple, 1998; Kincheloe, 2008) and also take a turn away from these same tenets. Diverse members need to have their culture addressed to ensure their participation and success in FFA. Some practical suggestions could include FFA activities and events which focus exclusively on urban agriculture. Some of these urban activities or events could happen at the National FFA Convention, which would show case urban agriculture and allow rural FFA members to experience some urban culture. Urban FFA awards could be tough to initiate at the state level because of the relative few number of urban programs in each state, so any urban award program may have to be started at the national level to ensure success. The involvement of urban agriculture students in the FFA is important because participation in FFA can lead to many positive outcomes (Phipps et al., 2008) and a lack of diverse members may only reinforce the dominant ideologies present in FFA (Lobel, 1990).

FFA may be able to overcome cultural differences by providing more universally appealing messages about agriculture and purposes at the convention. These changes could include more messages about the future of agriculture and how FFA members can have a role in that future. These messages need to have the voice of urban FFA members in mind. For instance, arguments about farmers needing to feed the world are important; however, urban members may feel like this is a role they cannot have because they realize they cannot literally feed the world or be a part of that mission since they are not farmers. Demonstrating the role of how science and social groups will help feed the world as well as local communities with safe and healthy food would help urban members find a connection. We are not arguing that FFA convention planners or even FFA advisors should eliminate the emphasis on history through rituals and activities. The past and future need to be woven together for every member. In the case of the Harris FFA members, the values of leadership and community development trumped the seemingly alienating values inherent in the FFA.

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Exploring Leadership Outcomes through a Yearlong Agricultural Leadership Development Program

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Abstract

This qualitative study explored the leadership development outcomes associated with specific experiences in a one-year, intensive agricultural leadership development program at a large northwest research university. Three specific experiences were explored: faculty mentoring, participation in a weekly seminar, and experiential learning through sustained community involvement. Students identified building relationships, gaining a deeper understanding of leadership, exposure to new experiences and increased communication skills as outcomes associated with having a mentor. When discussing the interactive seminar, students articulated collective growth, increased self-awareness, improved reflection skills, and a deeper understanding of leadership as outcomes of participation. Finally, for the experiential learning component, students identified outcomes associated with being pushed out of their comfort zone, improved networking skills, awareness of the value of community involvement and relationship skill building. Conclusions and recommendations are discussed for the utilization of these experiences in agricultural leadership education.

Introduction

“I’m really thankful for the Leadership Academy experience, because it helped me grow as a person. It pushed me down a path that I wanted to go on but didn’t think I was capable of going down, and the people I met along the way really helped me through it, and I’m extremely thankful for their help and their guidance.” – Jane, 2013 Leadership Academy graduate

Twelve months earlier, Jane sat in an interview room after having submitted a paper application to an undergraduate agricultural leadership development program, answering questions about her desire to learn and grow and her ability to take feedback and try new things. She was not polished, but she recognized her own weaknesses and need for further development. A committee of several faculty members selected Jane and ten other undergraduate students to participate in the program. As the program administrators, we paired Jane with a faculty member, who would serve as her mentor, and we did the same for every other student in the program. Through common experiences, candid discussions, and time together in a weekly seminar, the group became a cohort.

Jane created a roadmap for herself, setting leadership development goals, which she could tackle during her year in the program. She aligned the requirements of the program with her goals, to more purposefully engage in leadership development. Jane attended workshops and a weekly seminar, where she learned new skills and leadership perspectives. Then she got involved with a student club, volunteered for a community organization, and attended professional networking events to practice those skills. Jane’s mentor provided guidance, encouragement, and advice each step of the way, helping Jane debrief and reflect on her experiences.
Jane had confidence that the skills she worked to develop mattered, because she interacted regularly with industry professionals, some of whom served as advisers to the program, ensuring the curriculum and requirements were relevant and valuable for students who would soon enter the workforce. Others have also identified many of these skills – problem solving, teamwork, communication, decision making, organization of information, writing, critical thinking, and many others – as essential for college graduates (APLU, 2009; NFAMEC, 2006; SCANS, 2000).

The National Food and Agribusiness Management Education Commission (2006) identified interpersonal communication, critical thinking, and writing “among the most important skills that industry desires in new hires with the capacity to become leaders” (p. 5). Likewise the Association of Public and Land Grant Universities (APLU, 2009) compiled the responses of employers, alumni, faculty, and students, ranking communication, decision making, self-management, teamwork, professionalism, experience, and leadership, in that order, as important skills for new graduates. Using the 1991 Secretary’s Commission on Achieving Necessary Skills (SCANS) as a framework, and commissioned by the U.S. Department of Labor Employment and Training Administration, ACT, Inc. (2000) described a number of essential workplace skills, including integrity and honesty, acquiring and evaluating information, exercising leadership, participating as a team member, creative thinking, decision making, and listening.

Undergraduate students recognize some of these needs and have articulated a preference for personal growth and skill-building activities, self-development opportunities, and personalized settings, when pursuing leadership development (Allen & Hartman, 2009). Allen and Hartman recommended using “a variety of learning interventions” to positively affect the greatest number of students, despite differences in learning styles (p. 15). Leadership educators do employ a number of instructional strategies in the classroom (Jenkins, 2012), but little research exists that describes the outcomes specific to those instructional strategies. So we asked the question, what learning outcomes do graduates of this yearlong agricultural leadership program identify as a result of having completed the program? Based on this question we sought to explore the potential connections between student’s experiences in an agricultural leadership development program and the outcomes they articulate.

**Literature Review**

The development of leadership skills among students of all ages is a foundational component of the agricultural education discipline (Phipps, Osborne, Dyer, & Ball, 2008). This long history of leadership development has positioned departments of agricultural education as a premier hub for the leadership development of postsecondary students (Osborne, 2007). Therefore, it is no surprise that agricultural leadership education is a growing field (Brown & Fritz, 1994; Fritz et al., 2003; Velez, Moore, Bruce, & Stephens, 2014). Yet, little research exists which examines the relationship between the learning experiences within agricultural leadership education and the outcomes students articulate. However, research outside of agricultural leadership education has provided us with valuable insight into this important line of research.

Studies have shown that leadership is a skill, one that educational experiences can develop (Bennis, 1994; Buschlen & Dvorak, 2011; Wimmer, Meyers, Porter, & Shaw, 2012). Furthermore, many have identified the college experience as an ideal time to focus on leadership development (Astin & Astin, 2000; Buschlen & Dvorak, 2011; Komives, Owen, Longerbeam,
Mainella, & Osteen, 2005). Not surprisingly, the number of collegiate leadership development programs has been on the rise (Dugan & Komives, 2007; Engbers, 2006), which has created a need to identify the leadership skills developed through college experiences.

Student involvement in collegiate leadership development programs has been found to increase leadership skills (Cress, Astin, Zimmerman-Oster, & Burkhardt, 2001). Dugan and Komives (2007) found that student involvement in long-term, formal leadership development programs, of which the program studied is one, significantly enhanced the outcomes of creating change, citizenship, collaboration, and establishing a common purpose. In a more recent study, Buschlen and Dvorak (2011) found a college leadership experience, using the social change model, effectively enhanced the development of students’ consciousness of self, group values, and community values.

These studies provide evidence that experiences within collegiate leadership development programs and classrooms yield positive leadership outcomes, yet they fail to provide a clear description of student involvement in these experiences. A number of studies have addressed the experiences within leadership development programs, including a 2009 study by Allen and Hartman. Allen and Hartman categorized leadership development activities using a model originally proposed by Conger (1992) that identified leadership development occurring through four types of experiences: personal growth, conceptual understanding, feedback, and skill building. Within each of these four types of experiences, Allen and Hartman identified a variety of experiences which occur in leadership development programs, for example service learning activities (personal growth), reading leadership texts (conceptual understanding), self-assessments of leadership (feedback), and role-playing activities (skill building).

Jenkins (2012) expanded on the work of Allen and Hartman to identify the most commonly used experiences within leadership education. This study identified class discussions, interactive lectures, small group discussion, group projects, and research projects as the most commonly used pedagogies in leadership education. The next logical step in the research process is to identify the links between these curricular experiences and leadership skill development. Yet, research has identified that one of the key challenges among the leadership education community is the process of linking program activities with intended outcomes and impact (Russon & Reinelt, 2004).

Dugan and Komives (2007) attempted to link specific experiences with leadership outcomes. Researchers were able to identify that mentoring, campus involvement, community service, leadership roles, and formal leadership development programs positively influenced students’ leadership development. Yet, this study did not explore students’ level or type of involvement in these experiences. Our study will use the theory of student involvement (Astin, 1970a, 1970b, 1991, 1999), which identifies the need to understand both the level and type of student involvement, to explore students’ reflections of experiences while involved in a yearlong leadership development program and the outcomes they articulate while talking about those experiences. Through this analysis, we seek to provide evidence of potential connections between specific leadership development experiences and specific leadership development outcomes.
Theoretical Framework

We will use the theory of student involvement (Astin, 1970a, 1970b, 1991, 1999) to interpret and discuss the findings of our research. The theory of student involvement seeks to explain student development through college experiences by using three components: inputs, environment, and outcomes, in a model typically called the I-E-O model. Inputs refer to the characteristics and experiences with which students enter into their college experience, including demographic variables and background.

The second variable of interest in this model is the college environment. Astin (1970a, 1970b, 1991, 1999) identifies both distal and proximal aspects of this environment. The distal aspect accounts for the climate of the institution as a whole. Variables such as school size, types of buildings, and location of school are important when considering the distal aspects of the college environment. Proximal aspects, the environmental variables considered in this study, include variables in which the students are immersed, while in college. Proximal aspects include classroom discussions, level of involvement on campus, and leadership training experiences like the one of interest in this analysis.

The final component of the I-E-O model is outcomes of student experiences. These outcomes encompass the characteristics, skills, knowledge, attitudes, beliefs, and values students exhibit as they finish their college experience. We sought to identify potential links between the experiences of students involved in a leadership development program and the outcomes they described from that involvement.

Methods

The purpose of this qualitative study was to explore potential connections between student’s experiences in an agricultural leadership development program and the outcomes they articulate. We chose to study these potential connections using a qualitative research method because of its exploratory nature.

Data Collection

We collected data from all 11 participants in the leadership development program, a week after completion of the program, through a one-on-one, semi-structured, audio recorded interview (Creswell, 2009). Each interview was conducted by the lead researcher of this study and lasted between 30 and 45 minutes. We elicited respondents’ reflections of experiences in the program by asking, for example “What benefits and challenges did you experience through the weekly seminars?” and “What did you learn through interaction with your mentor?” Follow-up questions helped us identify additional information about students’ experiences in the leadership development program.

Data Analysis

The data analysis process we used showcases the “ongoing process involving continual reflection about the data” (Creswell, 2009, p. 184). We began the process by first preparing the data for analysis by transcribing the interviews. We then read through the transcripts to identify general concepts in the data. We met and discussed our initial interpretation of the data, which involved coding for learning outcomes identified by students. After initial analysis, a number of
outcomes-based themes emerged. We reexamined the data to determine if students identified those outcomes when discussing specific experiences in the leadership program and coded the data by identifying outcomes students articulated as they talked about certain aspects of the program. For example, when we asked one student, “what did you learn through interaction with your mentor?” he indicated, “I learned the value of building rapport with someone.” We coded the outcome of this comment as learning the value of building rapport and the experience as the mentoring component of the program. During this round of analysis, three program-component themes emerged: mentoring, seminars, and experiential learning. Respondents referenced these themes numerous times in the data. We then came to a consensus on our codes connecting the program component themes and outcome themes, which we will refer to as main themes and subthemes, respectively.

Participants
The participants in this study included 11 students in both the College of Agriculture and the College of Forestry at a large university in the Pacific Northwest. The participants included six females and five males. Students ranged from sophomore status to senior status. In order to keep the identities of the students confidential, students’ names have been replaced with pseudonyms for our description.

Research Quality
Throughout this study we sought to increase the dependability and trustworthiness of our findings (Creswell, 2009; Lincoln & Guba, 1985). We sought to increase the dependability by continually meeting as a research team to discuss our interpretations of the data and cross-check our codes (Creswell, 2009). We sought to increase the trustworthiness of our findings by using three researchers to analyze the data, the use of rich descriptions, and using student quotes to describe our findings (Creswell, 2009).

Limitations
An additional method for increasing the validity of our findings is being open about our experiences and involvement in the program that may have led to biases in our interpretation of the data. We all work very closely with the leadership development program we are studying. Our involvement in this program includes teaching the seminars, organizing the experiences associated with the program, and meeting with students throughout the year to encourage their success as they participate in the program. Through the use of continual meetings, cross-checking of codes, triangulation of data analysis and rich descriptions of the data, we attempted to overcome our potential biases and believe the findings presented through this study are valuable to the profession of agricultural leadership education.

An additional limitation of qualitative research is the lack of generalizability of the findings (Creswell, 2009). Qualitative research is best suited for exploring, in more depth, the experiences and interpretations of a small number of people. We acknowledge this limitation, and make no attempt to generalize our findings beyond the participants in this research study.

Findings
Analysis of the participant responses revealed several clear themes relating to programmatic elements of the program and several sub-themes related to program outcomes. The following
tables highlight the student results pertaining to three programmatic aspects of the program. While some of the subthemes differ, it is important to recognize that some similar subthemes emerged while students discussed different experiences. The student quotes attributed to subthemes were provided in the context of the specified main themes: mentoring, seminar, and experiential learning.

**Mentoring**
Each participant interacted with one faculty mentor for the duration of the academic year. Typically, students met once or twice per month for one hour mentoring sessions. The mentoring relationship was open-ended and, with the exception of a short mentor orientation, mentors were free to individualize their approach to mentoring. Review of the data revealed several subthemes that emerged when asking students about their experiences working with a faculty mentor. Subthemes included growth in relationships, improved ability to understand leadership, the new experience of mentoring, and development of communication skills. Table 1 highlights some of the student data associated with each of these subthemes.

Table 1
*Mentoring Subthemes: Relationships, Understanding Leadership, New Experience, and Communication*

<table>
<thead>
<tr>
<th>Subthemes</th>
<th>Participant Quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationships</td>
<td>“She taught me how important it is to be nice to people and be friends with people and like build a relationship with them” (Jane)</td>
</tr>
<tr>
<td></td>
<td>“He opened my eyes to the value of listening and conversation skills and building relationships” (Trevor)</td>
</tr>
<tr>
<td></td>
<td>“Another great thing about it was learning about the mentoring relationship and the value of it” (Trevor)</td>
</tr>
<tr>
<td></td>
<td>“Yeah I can’t talk enough about how great the mentor relationship or program through the Leadership Academy was. It was great.” (Andrew)</td>
</tr>
<tr>
<td></td>
<td>“I just learned the value of building a rapport with someone and taking the time to sit down and really talking things through with them” (Ruth)</td>
</tr>
<tr>
<td></td>
<td>“I really appreciated knowing that there was someone in the college who I could go to if I had any questions, sit over a cup of coffee with and just hash out life with” (Ruth)</td>
</tr>
<tr>
<td>Understanding Leadership</td>
<td>“I would say that I learned a lot about myself as well as how to be an effective and well-rounded leader” (Lacy)</td>
</tr>
<tr>
<td></td>
<td>“I learned from him that to be a leader is to stand up for what is right and also have a core set of values to go back to” (Niel)</td>
</tr>
</tbody>
</table>
“hearing how he learned these skills and how he struggled with them and what he’s done to overcome those were really, really great conversations” (Trevor)

New Experience

“I think having a mentor is key because looking back, trying to do this all on my own, I never would have done it” (Lacy)

“it was my first interaction with somebody in like a faculty position that wasn’t one of my professors” (Andrew)

Communication

“He really encouraged me to look at conversation, to really work on interpersonal communication with others” (Jill)

“I really learned a lot about effective communication with colleagues, things that work and don’t work” (Henry)

“We worked a lot on communication and not just like communication like how do I structure this it was more so okay how do I effectively connect with you inside of a professional relationship” (Brittany)

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**Seminar**

Students participated in a yearlong seminar course, which we facilitated. The course met for two hours, weekly, for the entire academic year. When the participants referenced the seminars in the data, four prevalent themes emerged: collective growth, self-awareness, reflection skills, and understanding leadership. Table 2 provides an overview of the student findings related to these four themes.

Table 2

*Seminar Subthemes: Collective Growth, Self-Awareness, Reflection Skills, and Understanding Leadership*

<table>
<thead>
<tr>
<th>Subthemes</th>
<th>Participant Quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collective Growth</td>
<td>“the benefit was just being able to have a group. It was almost like a sounding board” (Jane)</td>
</tr>
<tr>
<td></td>
<td>“getting to interact with the rest of the cohort and learn from them was a huge benefit” (Trevor)</td>
</tr>
<tr>
<td></td>
<td>“really discussing about leadership stuff because when you’re just reading a book or you know learning it by yourself you’re not really getting that feedback that you need” (Jill)</td>
</tr>
<tr>
<td></td>
<td>“There are some really amazing leaders in that class and in the Leadership Academy, and it’s just great to feed off of one another. Get each other’s input and insights and kind of just grow together” (Ruth)</td>
</tr>
</tbody>
</table>
Self-Awareness  “and the biggest thing I gained out of the seminar was the tools to use for listening” (David)

“the emotions one [seminar], I really caught myself when I was trying to talk somebody through an issue that I might have been having with them” (Henry)

“I thought it was really good to have those seminars to get feedback, to learn a lot more, to be able to apply it to like exercises, and challenge yourself, see where you are” (Jill)

Reflection Skills  “I really enjoyed the practicality of them” (Henry)

“I’ve only had a couple classes that I’ve really left like really thinking a lot about after and those are the ones you really remember” (Andrew)

“so the leadership seminars were incredible, probably my favorite part of the entire process” (Brittany)

“the growing and finding things out about myself that I didn’t realize, yeah” (Kim)

“is really beneficial just to sit down and listen to and just kind of learn” (Ruth)

Understanding Leadership  “I’m going to use this idea and I’m going to implement it and work on it so that was a strength” (David)

“Additionally the agenda workshop has made my meetings, both officer and chapter, of different clubs run much smoother, much more clarity, things get done, the action is there now” (Henry)

Experiential Learning
In the program, we asked students to volunteer and engage with an off-campus community organization for approximately four hours per week for the academic year. The impact of the experiential learning experience was evident in the lives of students and the subthemes of being pushed, networking, community involvement and relationship skills emerged. Table 3 highlights the subthemes associated with their experiential learning.

<table>
<thead>
<tr>
<th>Subthemes</th>
<th>Participant Quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being Pushed</td>
<td>“I mean the challenge kind of turned into a benefit in that I got the experience of utilizing my communication that I’ve been working on” (Henry)</td>
</tr>
</tbody>
</table>
“I thought it was great to make sure that the cohort is going outside of the college you know as a comfort zone type of thing we tend to stick to what we know and I absolutely loved it” (Lacy)

“the community involvement was where I did most of my growing” (Lacy)

“I learned how to work with diversity” (Kim)

“I really appreciated that just little reminder from the Leadership Academy, that what we do is important, and the organizations that we are involved in, they have a purpose and we need to make our time in those important or purposeful and effective” (Ruth)

Networking

“now my network if you will has expanded even more and I have gotten a lot out of that” (Jane)

“I got the opportunity to meet a lot of really interesting people” (Andrew)

“One of the benefits was meeting new people, creating new friendships, networking” (Kim)

Community Involvement

“it was like you know the first time I’d really done some really good leadership work like outside of the community or outside the university” (Jill)

“I interacted a lot with the people of Corvallis and learned a lot about this town, the people in it and it was a really great experience” (Lacy)

“I now understand that community involvement is really important to me and not just for me personally but I understand that now as we are looking forward into the future” (Brittany)

Relationship Skills

“I felt like I was doing something benefiting both me and the residents” (Andrew)

“working with people that were a lot older than me, basically kind of like a different population” (Jill)

“I was able to build relationships with people over the term and that was what one of my goals was so that was really beneficial” (Trevor)

Discussion & Conclusions

Our purpose as we began this study was to explore the learning outcomes associated with specific programmatic experiences. Prior literature has explored general leadership education
pedagogies, but we wanted to examine specific programmatic inputs within an agricultural leadership development program and their relationship to student learning outcomes. The research methods we utilized prevent us from establishing a causal connection; however, the results provide evidence of potential links between programmatic experiences and student leadership learning. The students themselves provided evidence for learning as they reflected back on their experiences.

Prior studies have shown that leadership development programs increase leadership skills (Cress et al., 2001). However, given the fact that the number of leadership programs is growing, it is imperative to begin the process of examining the pedagogical and programmatic components that students are identifying as promoting leadership growth. This study revealed a clear connection between leadership growth and the three programmatic elements of mentoring, a weekly seminar, and experiential learning.

The results revealed that being actively engaged with a faculty mentor aided students in their conceptualizations of relationships, understanding of leadership, and communication. Students referenced the mentor relationship as a new experience that was instrumental in promoting their growth. It is encouraging to see the student results considering that the faculty mentoring relationships were not highly structured. Faculty members tend to be busy with teaching, research, and service, and it is therefore easier to recruit faculty when the time constraints of mentoring are low. In this case, one two-hour mentor orientation session was all that was required for faculty to begin this process. We recommend that programs consider using faculty in mentoring roles with a practical understanding of their time constraints. This study revealed that with minimal upfront investment, a program where faculty serve as mentors can help to facilitate student leadership growth.

The development of a yearlong seminar, while presenting a logistical challenge, as it spans semesters/quarters, provided an environment that promoted collective growth, enhanced self-awareness, and facilitated the development of reflection skills and an understanding of leadership. Regarding collective growth, students enrolled in this program are part of a cohort. The same students persist in the program for the entire year. This allowed students to develop close relationships, and students referenced this group as a “sounding board,” a “huge benefit,” and a group where “it’s just great to feed off of one another.” Agricultural leadership development programs should consider the leadership growth that occurs through sustained, facilitated interaction. In addition, students referenced the development of self-awareness and reflection skills, both critical components of leadership. Programmatically, we – two faculty members and a graduate student – facilitated the seminar course, and an industry-based advisory board identified the seminar topics. This helped to ensure that the content was relevant to industry needs and potentially also aided in student buy-in and engagement during the seminars.

Students engaged in off-campus, community-based experiential learning referenced being pushed, increasing learning and understanding regarding community involvement, networking and relationship skills as areas of growth. Based on this weekly investment of three to four hours, students grew in their leadership. Other programs should consider implementing off-campus community involvement, if they want to push students and enhance their awareness of the importance of being involved in a community. The student voices in this study were very pronounced. Students learned and grew through community involvement.
The findings of this study help to articulate important considerations in the utilization of the student involvement theory. This study identified three proximal components of an environment focused on the development of leadership skills among college students. The data suggests that each of these proximal experiences, mentoring, seminars, and experiential learning, were conducive to the development of a variety of positive leadership outcomes. Agricultural leadership educators should consider the implementation of these experiences when designing leadership programs.

This is the first step down a road that, given further research, will eventually provide the causal links necessary to support the essential programmatic elements of an effective agricultural leadership development program, based on the desired learning outcomes. This line of research is now and will continue to be essential due to the continued growth of agricultural leadership education. Students enrolled in these leadership development programs are only with us for a while, yet they interact with us during a highly pivotal stage in their growth and development. We owe it to students like Jane to develop programs that help students grow, push their development, exceed their perceived capabilities, enhance their relationships, and provide help and guidance during this transformative stage. Our task is not easy, but the rewards of a changed life compel our efforts.

References


Expected as a Minimum or No Longer Needed: Examining Which Employment-ready Competencies May No Longer be Needed in Agricultural Communications Programs

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David L. Doerfert, Texas Tech University
Cindy Akers, Texas Tech University
Scott Burris, Texas Tech University
Keith Brigham, Texas Tech University

Abstract

Foundational to our discipline is the outcome that our formal education programs will allow individuals to become employment-ready graduates. As such, it is important to regularly review curriculum to ensure agricultural communications programs are effectively preparing students for entry into the industry. Equally important is to identify which elements of an agricultural communications program may no longer be needed by the industry. The purpose of this study was to gain a better understanding of what skills, knowledge, and competencies may no longer be needed for a graduate to be considered employment-ready. Industry members from California, Texas, and Iowa were utilized in a three-round Delphi study to identify the skills, knowledge, and competencies that may no longer be needed in current agricultural communications degree programs. In Round Three of the Delphi, panel members were asked to react to 39 statements that did not achieve consensus as being required for entry-level employment. With each statement, panel members indicated whether the item was expected in all employees, was no longer needed for initial employment, or uncertain as to whether the competency was needed. The findings showed that competencies that were once differentiating employment factors might now be the norm for all new hires.

Introduction

Foundational to our discipline is the desired outcome that our formal education programs will allow individuals to become employment-ready graduates. Embedded in the cornerstone of the related program and curriculum design efforts is the idea that the needs and expectations of the agriculture industry are fully identified and understood. Conversely, failing to reach this level of understanding will likely result in a gap between what exists and what is needed.

The impact of the graduate skill gap is far-reaching (Jackson, 2013) with consequences ranging from program graduates not being hired to related industry sectors not fully reaching their potential for success. For agriculture, the impacts will range from billions of dollars loss in potential revenue to a world where hunger becomes increasingly common.

While a seemingly simple goal, the realization of a seamless conduit for higher education graduates to industry seems to be elusive. Literature searches narrowed to the previous twelve months revealed studies in business management (Rizvi, Teckchandany, & Ahuja, 2013), environmental sciences (Keraminiyage & Lill, 2013), accounting (Aris, et al., 2013), marketing (Royle & Laing, 2014), information systems (Simon & Jackson, 2013), tourism (Cheng, 2013) and journalism (Cullen, et al., 2014) that identified existing gaps between university curriculum and industry expectations.
Perhaps this goal of a zero employability skills gap is indefinable as we are, in essence, trying to create a program that prepares a graduate for employment at a future point in time that is increasingly difficult to specify. Increasing globalization coupled with rapid emergence of new technologies (including mobile devices and social interaction technologies enabled by Web 2.0) combined with changing student demographics, cost pressures, and the emergence of for-profit higher education providers have not only created a maze for universities to navigate but may also cause us to forget our core values and beliefs. As such, it’s more—not less important for us to connect with the employment needs and expectations of industry. Flew (2013) stated:

“The relationship between universities and industry is a complex and multifaceted one. As the major employer of university graduates, industry bodies frequently identify the need for greater input into what occurs at universities so that graduates are better equipped for the workplace.” (p.16)

The agricultural communications industry was around nearly 100 years before it was recognized in academia (Tucker, 1996). Iowa State University was the first university to offer a course in agricultural journalism in 1905 (Duncan, 1957). Shortly thereafter, the first department of agricultural journalism was created at the University of Wisconsin-Madison in 1908 with their first course being Farm News Writing (Burnett & Tucker, 2001). Twenty years later, seven colleges were offering courses in agricultural journalism (Weckman, Witham, & Telg, 2000). Initially, a large part of the course work offered by newly established schools of journalism was professional writers and editors from the private sector (Tucker et al., 2003).

Since that time, a shift in name of university-level programs from agricultural journalism to agricultural communications occurred reflecting the increase of new media outlets, like broadcasting, public relations, and web-based communications (Irani & Scherler, 2002). In addition, the number of programs has continued to grow with approximately 30 programs in the United States by the turn of the century (Irani & Scherler, 2002).

While agricultural communications has changed drastically over the past 100 years (from print and radio broadcasts to social media and websites) the agricultural industry has also made drastic changes in the areas of genetics, mechanization (including electronics), food processing and safety, human and animal nutrition, bioenergy, natural resource management, and global markets. While both agriculture and agricultural communications have advanced, we must ask if higher education has been changing at the same pace. Olaniyan and Okemakinde (2008) stated:

For education to contribute significantly to economic growth and development, it must be of high quality to meet the skill-demand needs of the economy (p. 155).” . . . Education is seen as both a consumer and a capital good because it offers utility to the consumer and also an input to the production of other goods and services. As a capital good, education can be used to develop the human resources necessary for economic and social transformation (p. 157).

Despite all these changes in agriculture and agricultural communications, arguably the greatest change may be in the consumer who now appears to be “driving the farm tractor.” Armbruster and Knutson (2013) stated:
Consumers’ expectations regarding food have successively evolved beyond having basic life-sustaining nutrition that was safe and taste pleasing, with processing to preserve or convert basic ingredient products into useful forms. Their interests now also include ingredient labeling, unblemished external appearance, convenience, and nutrition labeling and increasingly information about health characteristics, organic production, local foods, environmental sustainability, and animal welfare. Consumerism was a major force in the formation of the Environmental Protection Agency (EPA), the development of nutritional labeling regulations, and the enactment of the 2010 Food Safety Modernization Act. (p. 7)

Due to the evolving nature both within and external to the agriculture industry, university agricultural communications programs are today focusing on more than just journalism taking on a “broader need to educate while communicating about agriculture” (Lockaby & Vernon, 1998, p. 16) while still maintaining the important information dissemination role to the farmer and related stakeholders. Preparing university graduates for initial employment success is challenging when there is a singular skill-set focus and need. Preparing graduates who are successfully communicating to multiple audiences with changing and increasingly divergent needs and wants on what is now a global scale increases that challenge exponentially. Couple this with the fact that agricultural communications programs face special challenges to future development in the university setting because of their relatively small size and reliance on other academic units to deliver curricula (Tucker et al., 2003), the challenge to remain current is far from a simple task.

**Literature Review**

During the past 30 years, several studies have sought to identify the industry needs and expectations for universities agricultural communications programs and the outcome of employment-ready graduates. Terry et al. (1994) determined that agricultural communication coursework should consist of courses from 28 disciplines consisting of 89 concepts. The concepts in 100% agreement, decided on by experts in agricultural communications and public relations, were grammar, government policies, history of American agriculture, communicating agriculture to the public-domestic, communicating agriculture to the public-international, agricultural policy, geography, word processing, creative strategies, campaign planning, graphic design, news writing, reporting, editing, ethics, design and layout, problem solving, speech writing, oral communication, scripting writing, and an internship that allows students to apply learned concepts.

Three years later, Sprecker and Rudd (1997) interviewed 10 faculty members, six alumni of the University of Florida program, and 14 practitioners on the board of directors for the Agriculture Institute of Florida. From their work, four themes emerged: (a) a broad overview of Florida food, agriculture, and natural resources including commodities, trade/economics, and policy/law is essential; (b) communications skills are more important to the job of an agricultural communicator than is agricultural knowledge; (c) students need to be versatile, able to do many communication tasks thoroughly; and (d) networking is an integral component of agricultural communication. Additionally, instructors and practitioners said that internships were critical for students to provide an experiential component within the industry. This same group also envisioned a majority of students working in public relations-related careers. Both practitioners
and alumni emphasized the need for desktop publishing skills and other computer applications. All three groups agreed that writing skills are the most valuable communication skills.

Akers (2000) conducted a study with industry leaders, high school agricultural education teachers, and agricultural communications university faculty to determine what agricultural communications competencies should be attained by high school students who take courses in agricultural communications. While several competencies were identified and classified what year they should be taken (freshman, sophomore, junior, and senior) several items were identified to be taught at the college level. Some of those competencies included: the use of video editing software; preparing a public relations campaign; identify the basics of corporate communications; discuss the role of public relations in advertising agencies; radio and TV broadcast; targeting audiences; and several other items related to general agriculture knowledge or public policy.

Like others, Weckman et al. (2000) realized that agricultural communications had changed its focus shifting away from agricultural journalism and more to general communications. As such, the authors sought to examine agricultural communications programs in the southern United States and to identify baseline characteristics. A majority of the responding universities stated that their enrollment had increased in the previous five years. Programs were also asked to classify their program’s preparation in one of three focus areas: (a) program focused primarily on teaching professional skills; (b) program primarily taught broad-based critical thinking skills; and (c) the program provided an equal combination of both professional and critical thinking skills. The respondents were almost equal between professional skills and professional skills/critical thinking. Programs were also asked what challenges they were facing. Some of the common themes were lack of understanding about what agricultural communications is; the image problem; and poor attitudes of journalism faculty towards the program.

Irani and Scherler (2002) were among the first researchers to look at job satisfaction of agricultural communications graduates. Graduates obtained jobs both in agriculture as well as several agencies outside of the industry. Just over half said their job related to agriculture. The majority of the respondents said that their education in agricultural communications prepared them for their job. However, when asked if they could take additional courses to develop professionally, they would take courses in marketing, public relations, management, and web design. Interestingly, M.S. graduates seem to have higher job satisfaction than B.S. graduates did, but overall graduates were satisfied with their career preparation.

Sitton et al. (2005) conducted a study to determine the public relations proficiencies in agricultural communications curriculum, as determined by agricultural public relations professionals. The researchers identified five technical agricultural proficiencies that were deemed important by 75% or more of the respondents: (a) discuss the impact of government and legislative policy upon agriculture; (b) interpret charts, graphs, and maps to make specific decisions related to business; (c) define conservation; (d) identify governmental regulatory agencies related to agribusiness; and (e) identify current government programs that support agricultural business. Thirty-six (36) competencies were perceived as important to 50% or more by the respondents. Three technical agricultural proficiencies were deemed required subject matter for agricultural communications undergraduates: (a) interpret charts, graphs, and maps to
make specific decisions related to business; (b) prepare a budget; and (c) list the purposes of governmental farm agencies.

Additionally, Sitton et al. (2005) identified general communications proficiencies that were important. Of the 67 general communications proficiencies presented, 51 proficiencies were perceived to be important by 75% or more of respondents. More than 75% of the public relations professionals used the following general communications proficiencies daily: (a) demonstrate the characteristics of responsibility and credibility; (b) model proficiency in time management and organization; (c) navigate the Internet [and] send and receive e-mail; (d) transfer and download information through a network; (e) apply human relations skills; (f) work under pressure; (g) correctly report facts; and (h) perform basic word processing.

Doerfert and Miller (2006) conducted an industry needs assessment prior to the 2004 National Agricultural Communications Summit. The purpose of the study was to “describe the current status and future needs of the agricultural communications industry to summit participants” (p. 23). Four themes emerged from the study: (a) The agriculture industry and its communication needs, wants, and expectations are changing rapidly; (b) The stakeholders of agricultural communications activities and products are changing, and these stakeholders have diverse communication needs, wants, and preferences; (c) The response time for communication-related activities continues to shorten; and (d) Image is increasing in importance for the agriculture industry and agricultural communications professionals.

After a breakout session at the 2008 national meeting of the American Association for Agricultural Educators, a concern emerged if agricultural communications students were adequately prepared for the demands of the industry (Irlbeck & Akers, 2009). A subsequent online survey was completed with agricultural communications professionals to determine what themes would be important for the industry’s future employees. Four themes emerged: (a) communication needs, wants, and expectation to change rapidly; (b) agricultural producers change and have differing communication wants, needs, and preferences; (c) the response time for communication is shortening; and (d) the image of agriculture is of growing importance for agricultural communications professionals. The study was consistent with Telg and Irani (2005) findings that agricultural communications students lacked curiosity, critical thinking, and analytical skills. Agricultural communications faculty members believed that theirs students did not know how to think critically and were not using critical thinking skills in the classroom (Telg & Irani, 2005).

Morgan (2008) conducted a Delphi study to determine the competencies needed by agricultural communications graduates as perceived by industry professionals. Thirty-seven industry professionals reached consensus on 85 statements after three rounds of questions. Ten statements receiving the highest level of agreement were: (a) conduct activities in an ethical manner, (b) ability to meet deadlines, (c) dependability, (d) strong work ethic, (e) reliable, (f) organizational skills, (g) demonstrate professional/business etiquette in workplace, (h) ability to multi-task, (i) time management skills, and (j) ability to be a productive member of a team.

Morgan (2012) conducted a focus group study with University of Georgia agricultural communications alumni. All participants agreed that students must write well. When looking at the styles of writing, participants felt that newspaper writing was declining, but stated that
magazine and public relations style writing are important. Overall, good communication skills were identified as important because they will use them in most of what they do as a professional. Communication skills identified in the study included: “understanding one’s audience, identifying the desired outcome from communication, editing, broad skill base, getting words down on paper, ability to organize thoughts, proper grammar, using proper style, and strategic writing” (p. 23).

With eleven studies in thirty years, the literature validates the dynamic nature within the agricultural communications industry and the need to frequently examine the industry’s needs and employment-ready expectations for university graduates.

**Purpose and Objective**

The purpose of this study was to understand the skills, knowledge, and competencies that agricultural communication industry professionals believe that future agricultural communications graduates must possess to be successful in the workplace. This study is related to Priority 3 of the National Research Agenda for Agricultural Education (Doerfert, 2011) and the need to have a sufficient scientific and professional workforce that addresses the challenges of the 21st century. The results reported in this manuscript are from a larger study and will focus on a singular objective of identifying the skills, knowledge, and competencies that may no longer be needed in current agricultural communications degree programs. With outside imposed limitation as to the length/duration of an undergraduate degree (e.g. 120 semester credit hours completed in four years), university-level agricultural communications faculty need to understand what they can eliminate from their curriculum as much as they need to understand the new industry expectations to include.

**Methodology**

This study was conducted using the Delphi method that used three rounds to collect data. The Delphi method was developed by Dalkey and Helmer (1963) at the RAND Corporation from a series of research studies conducted in the 1950s. The researchers developed the instruments used in each of the three round of this study. The three data collection rounds were conducted from April 2013 through July 2013.

The population frame for the study was agricultural communications industry professionals employed in organizations within California, Iowa, and Texas. These three states were purposively chosen as they represent the top three states for total agricultural cash receipts (United States Department of Agricultural Economic Research Service, 2013). To identify the potential participants for the Delphi, members of the National Agri-Marketing Association (NAMA) who were located in the three states were chosen from the annually published AgriMarketing Annual Marketing Service Guide (National Agri-Marketing Association, 2013). The participant goal was to have an even representation from each of the three states. Fifty-two members from California, Iowa, and Texas were asked to participate in the study. Initially, 19 participants agreed to participate. However, after all three rounds some participants were lost to attrition. A total of 14 participants completed all three rounds for a response rate of 73.7%.

Based off of the recommendations of Dalkey (1972), Delbecq, Van de Ven, & Gustafson (1975),
and Dalkey and Helmer (1963), 14 participants falls within their range of a sufficient number of Delphi participants.

**Round 1**
For the initial round, the researcher developed an open-ended instrument consisting of a single question. Open-ended questions tend to receive more complete answers with the use of electronic questionnaires than by using paper forms (Dillman, 2007). Selected staff within the Department of Agricultural Education and Communications at Texas Tech University reviewed the content validity of all survey rounds in order to ensure content validity as well as thoroughness. All survey rounds were completed via email that provided a Qualtrics™ link to complete the questionnaire. The first initial question was:

*What skills, competencies, and knowledge must agricultural communication graduates possess to be successful in the workplace?*

**Round 2**
All 116 responses that emerged from Round One were included in Round Two. To prepare the submitted responses for Round Two, the researcher used qualitative research techniques to determine knowledge, skills, and competencies statements and topic areas as well as reword similar submissions into a single statement. This included the researchers using open coding, which is the process of breaking down, examining, comparing, conceptualizing, and categorizing data (Corbin & Strauss, 1990). Once open coding was completed, the researcher then began axial coding, which is a set of procedures where data are put back together in new ways after open coding by making connections between categories (Corbin & Strauss, 1990). After the primary researcher coded the data, two other independent researchers reviewed the statements and finalized the categorization process. From this process, seven categories emerged from the Round One submissions: writing and grammar; communication; agriculture; business; specific skills; personal traits; and technology.

In Round Two, panel members were asked to rank each competency statement under the seven categories using a four-point Likert-type scale. The Likert-type scale was assigned a numerical variable with 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, and 4 = Strongly Agree. To determine which competency statement would advance to Round Three, the researcher established that an 80 percent or higher level of agreement by the panel members would be required.

**Round 3**
In Round Three, panel members were probed to determine why 39 statements did not receive 80% agreement. To facilitate their response, the industry panel were provided three choices for each statement: (a) competency is expected in all new hires (no longer considered a differentiating factor in the hiring process), (b) competency is no longer needed in a new hire, or (c) uncertain as to if the competency is still needed in new hires.

**Findings**
Fourteen panel members responded to the Round Three question of why each of 39 statements were not considered among the top requirements for new employees. The items “Relationship
“Relationship development with peers” and “Demonstrate use of Microsoft Office” were the two most expected competencies in all new hires (92.9% agreement) though when asked about the individual Microsoft Office programs (e.g. Outlook, Word, Excel), the response was more divided (Table 1). Additionally “Plan and manage for a crisis,” “Analyze numbers, charts, graphs, demographics or statistics,” and “Evaluate the value of media (media analysis)” were also expected in all new hires (85.7% agreement) and were not considered to be a differentiating factor when making a hiring decision.

While these competencies were expected in all new potential hires, the reasons why the remaining items were not included as a top competency was less certain. Of note, the panel members were uncertain as to the need for new hires to be skilled in Adobe software (entire Creative Suite and individual program) and the ability to speak more than one language.

Table 1

<table>
<thead>
<tr>
<th>Competency</th>
<th>Expected Competency in All Hires</th>
<th>No Longer Needed</th>
<th>Uncertain as to Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationship development with peers</td>
<td>92.9% (13)</td>
<td>0.0% (0)</td>
<td>7.1% (1)</td>
</tr>
<tr>
<td>Demonstrate use of Microsoft Office programs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microsoft Word</td>
<td>92.9% (1)</td>
<td>0.0% (0)</td>
<td>7.1% (1)</td>
</tr>
<tr>
<td>Microsoft Outlook</td>
<td>78.6% (11)</td>
<td>14.3% (2)</td>
<td>7.1% (1)</td>
</tr>
<tr>
<td>Microsoft Excel</td>
<td>71.4% (10)</td>
<td>7.1% (1)</td>
<td>21.4% (3)</td>
</tr>
<tr>
<td>Microsoft Power Point</td>
<td>64.3% (9)</td>
<td>7.1% (1)</td>
<td>21.4% (3)</td>
</tr>
<tr>
<td>Microsoft Publisher</td>
<td>28.6% (4)</td>
<td>7.1% (1)</td>
<td>64.3% (9)</td>
</tr>
<tr>
<td>Microsoft Access</td>
<td>21.4% (3)</td>
<td>7.1% (1)</td>
<td>71.4% (10)</td>
</tr>
<tr>
<td>Microsoft OneNote</td>
<td>14.3% (2)</td>
<td>7.1% (1)</td>
<td>78.6% (11)</td>
</tr>
<tr>
<td>Plan and manage for a crisis</td>
<td>85.7% (12)</td>
<td>0.0% (0)</td>
<td>14.3% (2)</td>
</tr>
<tr>
<td>Analyze numbers, charts, graphs, demographics or statistics</td>
<td>85.7% (12)</td>
<td>0.0% (0)</td>
<td>14.3% (2)</td>
</tr>
<tr>
<td>Evaluate the value of media (media analysis)</td>
<td>85.7% (12)</td>
<td>0.0% (0)</td>
<td>14.3% (2)</td>
</tr>
<tr>
<td>Understand human capital (knowledge, social and personality attributes as it relates to an economic value for the company)</td>
<td>78.6% (11)</td>
<td>7.1% (1)</td>
<td>14.3% (2)</td>
</tr>
<tr>
<td>Identify risks that could become a crisis</td>
<td>78.6% (11)</td>
<td>0.0% (0)</td>
<td>21.4% (3)</td>
</tr>
<tr>
<td>Realize the impact of international relations on agricultural business costs</td>
<td>78.6% (11)</td>
<td>7.1% (1)</td>
<td>14.3% (2)</td>
</tr>
<tr>
<td>Understand that there are a limited number of people who are farming and ranching</td>
<td>71.4% (10)</td>
<td>7.1% (1)</td>
<td>21.4% (3)</td>
</tr>
<tr>
<td>Develop and test messages</td>
<td>71.4% (10)</td>
<td>0.0% (0)</td>
<td>28.6% (4)</td>
</tr>
<tr>
<td>Evaluate real-life experiences</td>
<td>64.3% (9)</td>
<td>7.1% (1)</td>
<td>28.6% (4)</td>
</tr>
<tr>
<td>Possess an insatiable curiosity about all things having to do with agriculture</td>
<td>64.3% (9)</td>
<td>0.0% (0)</td>
<td>35.7% (5)</td>
</tr>
</tbody>
</table>
Table 1 continued

<table>
<thead>
<tr>
<th>Competency</th>
<th>Expected Competency in All Hires</th>
<th>No Longer Needed</th>
<th>Uncertain as to Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possess a working knowledge over a multitude of subjects (e.g. history, economics, business, science, and engineering)</td>
<td>64.3% (9)</td>
<td>0.0% (0)</td>
<td>35.7% (5)</td>
</tr>
<tr>
<td>Outline project scheduling</td>
<td>57.1% (8)</td>
<td>14.3% (2)</td>
<td>28.6% (4)</td>
</tr>
<tr>
<td>Outline project planning</td>
<td>57.1% (8)</td>
<td>14.3% (2)</td>
<td>28.6% (4)</td>
</tr>
<tr>
<td>Understand the basics associated with building contractual relationships</td>
<td>57.1% (8)</td>
<td>14.3% (2)</td>
<td>28.6% (4)</td>
</tr>
<tr>
<td>Illustrate knowledge of graphic design</td>
<td>57.1% (8)</td>
<td>0.0% (0)</td>
<td>42.9% (6)</td>
</tr>
<tr>
<td>Ability to create page layouts</td>
<td>50.0% (7)</td>
<td>0.0% (0)</td>
<td>50.0% (7)</td>
</tr>
<tr>
<td>Operate video editing software</td>
<td>50.0% (7)</td>
<td>0.0% (0)</td>
<td>50.0% (7)</td>
</tr>
<tr>
<td>Demonstrate use of Adobe Creative Suite</td>
<td>50.0% (7)</td>
<td>14.3% (2)</td>
<td>35.7% (5)</td>
</tr>
<tr>
<td>Adobe Acrobat</td>
<td>42.9% (6)</td>
<td>7.1% (1)</td>
<td>50.0% (7)</td>
</tr>
<tr>
<td>Adobe Photoshop</td>
<td>42.9% (6)</td>
<td>0.0% (0)</td>
<td>57.1% (8)</td>
</tr>
<tr>
<td>Adobe InDesign</td>
<td>35.7% (5)</td>
<td>7.1% (1)</td>
<td>57.1% (8)</td>
</tr>
<tr>
<td>Adobe Dreamweaver</td>
<td>35.7% (5)</td>
<td>7.1% (1)</td>
<td>57.1% (8)</td>
</tr>
<tr>
<td>Adobe Flash</td>
<td>35.7% (5)</td>
<td>7.1% (1)</td>
<td>57.1% (8)</td>
</tr>
<tr>
<td>Adobe Illustrator</td>
<td>35.7% (5)</td>
<td>7.1% (1)</td>
<td>57.1% (8)</td>
</tr>
<tr>
<td>Adobe Bridge</td>
<td>28.6% (4)</td>
<td>7.1% (1)</td>
<td>64.3% (9)</td>
</tr>
<tr>
<td>Adobe Fireworks</td>
<td>28.6% (4)</td>
<td>7.1% (1)</td>
<td>64.3% (9)</td>
</tr>
<tr>
<td>Demonstrate a high level of photography skills</td>
<td>42.9% (6)</td>
<td>14.3% (2)</td>
<td>42.9% (6)</td>
</tr>
<tr>
<td>Illustrate knowledge of web design</td>
<td>42.9% (6)</td>
<td>0.0% (0)</td>
<td>57.1% (8)</td>
</tr>
<tr>
<td>Speak more than one language</td>
<td>35.7% (5)</td>
<td>7.1% (1)</td>
<td>57.1% (8)</td>
</tr>
<tr>
<td>Employ organization tools (like Gantt charts)</td>
<td>21.4% (3)</td>
<td>21.4% (3)</td>
<td>57.1% (8)</td>
</tr>
</tbody>
</table>

Conclusions, Implications and Recommendations

This manuscript emerged from a larger study that described what competencies are needed in university agricultural communications graduates that are employment-ready, its purpose and objective was to identify which competencies could potentially be eliminated in lieu of new competencies that have emerged as an industry need. While 39 statements were identified and reacted to by industry professionals, the results did not produce the level of clarity hoped for by the researchers.

This study revealed that the majority of these 39 competencies—many once considered as differentiating factors between agricultural communications employment applicants—may now be the norm for all new employees. These competencies include soft skills such as developing relationships with peers to more technical skills such as the ability to use of the Microsoft Office programs, plan and manage for a crisis, analyze numbers, charts, graphs, demographics or statistics, and evaluating the value of media (media analysis). While the results provide insight into the competency expectations for new agricultural communications hire, it leaves university faculty with challenging decisions. If portions of these competencies are expected in all new
hires, should they remain in a university-level agricultural communications program? To what extent are incoming university students possessing all or part of these competencies (e.g., they know how to use Microsoft Word)? If in part, do university faculty need to continue developing these skills in their programs/courses or can the student be expected to continue their skill development without faculty involvement or guidance? These decisions need to be considered carefully, as “the need to provide a highly educated, skilled workforce capable of providing solutions to 21st century challenges and issues has never been greater” (Doerfert, 2011, p. 19).

Beyond the challenging curriculum factors, faculty will also need to review their instructional strategies. While students seemingly dread group projects, being able to develop relationships with others is one of the most expected competencies for agricultural communications graduates. Understanding that a modification in instructional strategies could potentially develop skills and competencies (i.e., soft skills) may increase a program’s ability to produce employment-ready graduates.

The same consideration should be given to the Microsoft Office software package. While it may appear to faculty that most students are able to use Microsoft Word as evidence by their assignment submissions, there are also many features in Word that go unknown or underutilized by students. Requiring assignments that utilize or integrate specific tools and features within software programs may positively impact technical skills employment-readiness. Further, the creation or adoption of a competency exam for Microsoft Office or other software programs may serve as a way to assess the student’s level of competence on the software and identifying potential areas of weakness that the student (or the faculty) may wish to address. Like other leveling-type exams, this may help to either encourage or require students to take a leveling class to ensure they are graduating with these expected competencies.

While industry may have expectations for new hires, part of the faculty deliberations must be the appropriateness of delivering the content at the undergraduate level. For example, planning and managing a crisis was also an expected competency for all new hires with more than an 85% agreement from the Delphi panel members. However, a previous study stated that faculty members see crisis management as an upper level or graduate course topic (Sitton, Cartmell, & Sargeant, 2005). This represents a skill gap that must be addressed with further research and deliberation by university faculty.

Similarly, agricultural communications faculty must examine the ability of other courses within the agricultural communications degree (and their direct control) to meet industry expectation. An example is the competency of the ability to analyze numbers, charts, graphs, demographics or statistics (85.7% of Delphi panel member agreement as an expected competency in all new hires). Arguably, this competency relates back to business and plays a vital role in understanding agriculture. Crop predictions, future markets, and audience analysis all involve analyzing numbers, graphics, or statistics and are likely to be integral to other courses commonly found in agricultural communications degree programs. This is supported by previous studies (Akers, 2000; Sitton et al., 2005) showing that undergraduate students commonly gain these skills through business or economic courses. While Tucker et al. (2003) presented the reliance on other academic units to deliver curricula, university faculty may need to increase their collaboration with other academic units if potential employment skill gaps are to be minimized or eliminated.
Similarly, of the items that are expected, more research is needed to determine if agricultural communications graduates actually possess those competencies upon graduation. If these competencies are now the norm, it would be beneficial to review curriculum to determine if the competencies are being addressed at some point in their curriculum – whether that is in the agricultural communications curriculum or within courses outside the program.

Through this Delphi study, panel members deemed agricultural communications-related competences expected, no longer needed, or were unsure of their need. As the competencies were ranked, there were a higher percentage of panel members choosing “Uncertain as to need.” It would be very beneficial to send a list of competencies to a much larger group to have a more comprehensive list of what competencies are expected or no longer needed.

With the dynamic nature of agriculture, agricultural communications, and related technological changes, university agricultural communications program may never create the seamless conduit for graduates into the profession, a regular examination of industry needs and expectations for our graduates will ensure there are no large gaps for graduates to overcome.

References


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Perceptions of Agricultural Education Professionals Regarding the Purpose of School-Based Agricultural Education

David C. Frazier, Tarleton State University
Anna L. Ball, University of Missouri
Wayne Atchley, Tarleton State University

Abstract

The purpose of this study was to describe agricultural education professionals’ perceptions regarding the purpose of school-based agricultural education (SBAE) curriculum. The target population for this national study was agricultural education professionals (N=13,049). The proportional, stratified sample used in this study included homogeneous subgroups of SBAE teachers (n=12,701), teacher educators who concentrate on SBAE teacher development (n=218), and state agricultural education program leaders who are engaged with continuing professional development efforts of SBAE teachers (n=130). The resulting sample (n=533) consisted of 310 SBAE teachers, 127 teacher educators and 96 state agricultural education program leaders from every state in the nation. These professionals identified teaching leadership skills as the top purpose followed closely by teaching life skills, developing higher-order thinking skills and developing interpersonal communication skills. These professionals were unsure as to whether SBAE should be teaching traditional production agriculture, preparing students for technical schools or providing industry certification/licensing.

Introduction and Literature Review

The intended outcome of school-based agricultural education (SBAE) curriculum has evolved since it was first integrated into the field of secondary education. SBAE has evolved from a science based, academic curriculum directed by the United States Department of Agriculture to a vocational education program overseen by the United States Department of Education to meet the demands created by society and legislation (Hillison, 1996). Current trends facing the discipline of agricultural education that impact SBAE curriculum include the integration of science both as content and process (Roberts & Ball, 2009), as well as, inclusion of biotechnology, horticulture, food science, products and processing, entrepreneurship, leadership, forestry and natural resources (Balschweid, 2002; Boone, Gartin, Boone & Hughes, 2006; Conners & Elliott, 1995; Ricketts, Duncan, & Peake, 2006).

Since the integration of agricultural education into the American educational system via the Civilization Fund Act of 1819 (Hamilton, 2000), various forms of SBAE curriculum have been implemented that have altered the outcome. In 1889, Chambers’ Encyclopedia defined agricultural education as “a comprehensive term, including instruction in chemistry, geology, botany, zoology, mechanics-embracing, in short the science as well as the practice of agriculture” (p. 61). By contrast, the Smith-Hughes Act of 1917 stated that agricultural education “…shall be fit for useful employment; that such education shall be of less than college grade and be designed to meet the needs of persons over fourteen years of age who have entered or who are preparing to enter upon the work of the farm or of the farm home” (Smith Hughes Act, 1917). Thus, the purpose of SBAE shifted in less than 30 years. This purpose has continued to evolve based on federal legislative and societal demands. According to the National FFA (2014), the
current purpose of SBAE curriculum is to prepare students for “successful careers and a lifetime of informed choices in the global agriculture, food, fiber and natural resources systems” (p. 5). The National Council for Agricultural Education (2014) stated that school-based agricultural education is “…a systematic program of instruction available to students desiring to learn about the science, business, and technology of plant and animal production and/or about the environmental and natural resources systems.” For SBAE curriculum to evolve and prosper, it is imperative that a consensus be established among agricultural education professionals regarding the purpose of SBAE curriculum.

In order for agricultural education professionals to reach a consensus on purpose of the SBAE curriculum, they must first consider the impact of legislation on the evolution of curriculum. The Smith-Hughes Act of 1917 established vocational education as a separate and distinct form of education that integrated instruction, supervised projects and student organizations (Hayward & Benson, 1993). Public schools offering SBAE quickly adopted the purpose of SBAE to be vocational; thus, emphasizing the teaching of vocational skills through the context of agriculture. Vocational training provided students with the opportunity to learn skills in the classroom/laboratory and the opportunity to use these skills in vocational jobs outside the school setting. With the advent of CASE curriculum, the implication of learning agricultural, food and natural resources subject matter utilizing science inquiry has become popular among SBAE programs (CASE, 2014).

With the number of shifts in the focus of SBAE curriculum, there are many questions that arise regarding the purpose of SBAE curriculum. Legislative initiatives, societal changes and industry needs have created a shift in SBAE curriculum; yet, there is little consensus in the literature (Jenkins, 2008; Roberts & Ball, 2009) and little anecdotal evidence in the profession to provide clarity regarding the purpose of SBAE curriculum.

Four basic entities have had a direct, recent impact on the intended purpose of SBAE curriculum. The Strategic Plan for Agricultural Education set forth goals regarding content of SBAE curriculum (Team AgEd, 2000). The National FFA Organization strategies outline specific SBAE goals that should be attained by every member (National FFA, 2009). The National Quality Program Standards for Secondary (Grades 9-12) Agricultural Education introduced guidelines that should be attained regarding content and instruction within SBAE (Team AgEd, 2007). Finally, the United States Department of Education’s Office of Vocational and Adult Education (USDE, 2006) developed expectations for curriculum within vocational programs, such as SBAE. Each of these entities identified goals and purposes for SBAE curriculum; however, significant variations exist in their views. If curriculum is going to be constant among SBAE programs, it is imperative that a consistent set of goals be established regarding the purpose of SBAE curriculum (Klein, 1991). Once established, these goals will provide a highly effective, well-defined path for performance, quality, clarity, and expectations (Locke & Latham, 1990).

Theoretical and Conceptual Framework

The conceptual framework for this study was adapted from Rojewski’s (2002) work in career and technical education (see Figure 1). This framework capitalizes on a coherent perspective of the field and is based on legislation, description of the work place and work force, research,
opinion and everyday practice. Five components of an educational program: curriculum, instruction and delivery options, student assessment, student populations, and program evaluation are represented by this conceptual framework. Curriculum reflects the state of the field; what is considered important and what is being taught. The purpose of SBAE curriculum is the driving force behind this study. By defining a strong set of academic goals for SBAE curriculum, stakeholders will be able to provide an emphasis for integration of academics, articulate the SBAE curriculum purpose and connect SBAE curriculum to the workforce.

Figure 1. Conceptual framework for agricultural education as adopted from Rojewski’s (2002) model for career and technical education.

This conceptual framework accounts for the internal and external forces, such as the new and emergent economy, education reform initiatives, student learning and the expectations of society for career and technical education, on SBAE curriculum (Rojewski, 2002). These forces play a significant role in the development of SBAE curriculum; thus, they serve as parameters for this study to follow. Educational reforms, legislative regulations and SBAE initiatives have provided a platform for change within SBAE curriculum, as well as a need for redefining the goals of SBAE curriculum. SBAE teachers, teacher educators, and state agricultural education program leaders have the ability to shape the purpose of SBAE programs by demanding that curriculum taught in SBAE be rigorous and relevant to the current agricultural industry. Research has indicated that SBAE curriculum directly influences student learning, motivation and
achievement within SBAE (Bransford, Brown & Cocking, 2000; McCormick & Whittington, 2000; Roberts & Dyers, 2005). By studying the perceptions of agricultural education professionals, this study will identify what purposes of SBAE curriculum are considered significant.

**Purpose and Research Objectives**

The purpose of this study was to describe agricultural education professionals’ perceptions regarding the purpose of school-based agricultural education (SBAE) curriculum. The study was guided by two research objectives:

1. Describe agricultural education professionals by age, sex, years of experience in agricultural education, regional locality and highest educational degree attained.
2. Explain the perceptions of agricultural education professionals regarding the purpose of SBAE curriculum

**Methods/Procedures**

This study was descriptive in nature and sought to describe perceptions of SBAE professionals regarding the purpose of SBAE curriculum using survey methods. Descriptive research of this type has no manipulation of variables; therefore, it can have no attempt to establish causality (Ross, 1999).

**Limitations of the Study**

The study used three different groups of agricultural education professionals: SBAE teachers, teacher educators and state agricultural education program leaders. Each participant in this study was randomly chosen from within his/her subgroup using names provided by the National FFA Organization. All frames were scrutinized for errors and duplicates; however, the researcher had no formal means for verifying accuracy. Participants may have responded differently to items on the instrument based on previous experience with SBAE curriculum.

**Population**

The target population for this national study was agricultural education professionals (N = 13,049). The proportional stratified sample used in this study included homogeneous subgroups of SBAE teachers (n = 12,701), teacher educators who concentrate on SBAE teacher development (n = 218), and state agricultural education program leaders who are engaged with continuing professional development efforts of SBAE teachers (n = 130). Table 1 summarizes the data of this particular population. Stratifying samples assures that all key subgroups within a population are represented and allows the researcher to study the differences between subgroups (Ary, Jacobs, Razavieh & Sorensen, 2006). Because the subgroups of this study had different population sizes, a proportional, stratified sampling was used. Proportional, stratified sampling is noted to have more statistical precision than simple random sampling (Trochim, 2006). Random samples were selected from each subgroup using Randomizer.com. Based on Dillman’s (2007) recommendations, 610 samples were randomly selected for this study. Of these, 373 were SBAE teachers at the secondary level, 140 were teacher educators and 97 were state agricultural education program leaders. Because all participants were chosen randomly within each
subgroup, this study was considered probabilistic; thus, findings can be inferred back to the target population.

Table 1
Agricultural Education Professional Subgroups (N = 13,049)

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Total Population</th>
<th>Sample Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBAE teachers</td>
<td>12,701</td>
<td>373</td>
</tr>
<tr>
<td>Teacher educators concentrating on agricultural education</td>
<td>218</td>
<td>140</td>
</tr>
<tr>
<td>State agricultural education leaders</td>
<td>130</td>
<td>97</td>
</tr>
</tbody>
</table>

The frame for each subgroup was provided by the National FFA Organization after permission was requested and received. The National FFA Organization maintains multiple frames including teacher educators, SBAE teachers and state agricultural education program leaders. These frames are released for research purposes only and each request is scrutinized before approval and permission is given by the National FFA Organization. As per their research policy, a non-disclosure was completed and filed with the National FFA Organization. To reduce selection error, the frames were scrutinized for accuracy, completeness, and duplications and corrections were made when necessary. Sampling error was addressed by using random sampling within each of the three subgroups.

Instrumentation
The Purpose and Current Outcome of SBAE Curriculum Instrument was developed because email questionnaires have the advantage of quicker returns, lower non-response to individual items, cost effectiveness and timelines of responses (Dillman & Bowker, 2000). Hosted Survey™ was used to create and distribute the online questionnaire because of its affordability, design options and customer service.

The Purpose and Current Outcome of SBAE Curriculum Instrument was developed after a review of literature. The questionnaire comprised of two sections. Section I assessed the perceptions of agricultural education professionals regarding the purpose of SBAE curriculum. A total of 18 items were included in this section. The first 17 items asked participants to use a five point Likert-type scale comprised of 1 = definitely disagree, 2 = disagree, 3 = uncertain, 4 = agree and 5 = definitely agree. The 18th item was an open-ended question asking respondents to list other purposes of SBAE curriculum that were not included in the previous thematic areas. Section II solicited demographic information including age, sex, years of experience in agricultural education, regional locality, and educational level. Sex and age were open-ended questions while the remaining demographic information were forced choice items.

Validity and Reliability
Face and Content validity of the instrument were established by a panel of experts consisting of five teacher educators who were knowledgeable in developing instruments and who had extensive research experience within agricultural education. Each panel member was contacted via email asking if they would be willing to serve as a panel of experts for this study. All five agreed to serve on the panel and a hard-copy of the Purpose and Current Outcome of SBAE Curriculum Instrument was mailed along with a letter explaining their purpose as a panel member. Each member was also contacted via email and given the hyper-link to the online
version of the Purpose and Current Outcome of SBAE Curriculum Instrument. Suggestions and comments offered by the panel were incorporated into the final version of the instrument.

A pilot test was used to determine the reliability of the Purpose and Current Outcome of SBAE Curriculum Instrument. The pilot group (N = 40) was purposefully selected individuals including SBAE teachers, state agricultural education program leaders and teacher educators that were not a part of the randomly selected sample. Each of these members was chosen because of their expertise in their respective field. A test-retest was used to establish reliability with this instrument (Trochim, 2006). On April 7, 2009 participants of the pilot test were administered the Purpose and Current Outcome of SBAE Curriculum Instrument and asked to complete section I. The email that accompanied the questionnaire explained the purpose of the pilot test and included a hyper-link to HostedSurvey™.

There was a 90% response rate (n = 36) for the first phase of the test-retest. After a two week period, the same instrument was administered to the 36 original respondents. After two weeks, 94% of the original respondents (n = 34) had responded a second time. Efforts were made to contact the remaining two respondents by phone; however, no response was received. The final completion rate of the test-retest was 34 respondents. Bivariate correlations were calculated to establish the reliability of perceptions regarding purpose of SBAE curriculum variables (Table 2). Individual items showed a bivariate correlation score ranging from .80 to .98. Each of the items was deemed reliable according to Nunnaly (1978)

Table 2
Test-Retest Correlations for Purpose of SBAE Curriculum Instrument (n = 34)

<table>
<thead>
<tr>
<th>The purpose of SBAE curriculum is to…</th>
<th>r²</th>
</tr>
</thead>
<tbody>
<tr>
<td>teach occupational skills</td>
<td>.86</td>
</tr>
<tr>
<td>provide industry certification/licensing</td>
<td>.86</td>
</tr>
<tr>
<td>integrate academic skills in the context of agriculture</td>
<td>.84</td>
</tr>
<tr>
<td>teach agricultural literacy</td>
<td>.93</td>
</tr>
<tr>
<td>encourage wise management of the environment</td>
<td>.81</td>
</tr>
<tr>
<td>increase awareness of global agriculture</td>
<td>.86</td>
</tr>
<tr>
<td>cultivate student entrepreneurship</td>
<td>.87</td>
</tr>
<tr>
<td>teach traditional production agriculture</td>
<td>.80</td>
</tr>
<tr>
<td>teach non-traditional agriculture</td>
<td>.91</td>
</tr>
<tr>
<td>prepare students for technical schools</td>
<td>.92</td>
</tr>
<tr>
<td>prepare students for college/university</td>
<td>.90</td>
</tr>
<tr>
<td>prepare students for careers in agriculture</td>
<td>.91</td>
</tr>
<tr>
<td>develop higher-order thinking skills</td>
<td>.93</td>
</tr>
<tr>
<td>develop interpersonal communication skills</td>
<td>.88</td>
</tr>
<tr>
<td>develop life skills</td>
<td>.81</td>
</tr>
<tr>
<td>teach personal development</td>
<td>.87</td>
</tr>
<tr>
<td>teach leadership skills</td>
<td>.98</td>
</tr>
</tbody>
</table>

Data Analysis
Data were analyzed using SPSS 16.0. The alpha level of .05 was established a priori. Cohens (1988) descriptors were used to describe the magnitude of relationships reported.
Objective one sought to describe agricultural education professionals by age, sex, years of experience in agricultural education, regional locality and highest educational degree attained. Descriptive statistics were reported on both measures of central tendency and measures of variability. Sex, regional locale, role in agricultural education and highest degree attained were categorical data, so frequency counts and percentages were reported. Mean scores, standard deviations and ranges were generated for the continuous data of age and years of experience in agricultural education.

The purpose of objective two was to explain the perceptions of agricultural education professionals regarding the purpose of SBAE curriculum. Mean scores, standard deviations and ranges were generated for responses of agricultural education professionals to all items found in section I of the Purpose and Current Outcome of SBAE Curriculum Instrument.

Findings

Objective one sought to describe role of agricultural education professionals within agricultural education, age, sex, years of experience in agricultural education, regional locale and educational level.

Table 3 shows the average age and years of experience of agricultural education professionals. Participants of the study ranged in age from 23-72 with an average age of 42.62 (n = 533). The average number of years working in agricultural education was 17.56 with a range of experience from one to forty-eight years.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>42.63</td>
<td>10.99</td>
<td>23-72</td>
</tr>
<tr>
<td>Number of Years Working in Agricultural Education</td>
<td>17.56</td>
<td>10.63</td>
<td>1-48</td>
</tr>
</tbody>
</table>

Table 4 shows the professional characteristic information gathered regarding the role of agricultural educational professionals in agricultural education. Fifty-eight percent (n = 310) were SBAE teachers, 24% were teacher educators and 18% reported to be state agricultural education program leaders.

<table>
<thead>
<tr>
<th>Role in Agricultural Education</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBAE teachers</td>
<td>310</td>
<td>58</td>
</tr>
<tr>
<td>Teacher Educators</td>
<td>127</td>
<td>24</td>
</tr>
<tr>
<td>State Agricultural Education Program Leaders</td>
<td>96</td>
<td>18</td>
</tr>
</tbody>
</table>

Table 5 summarizes the data of sex for participants in this study. Of the 533 agricultural education professionals, 37% (n = 113) were female and 63% (n = 197) were male.
Regional locale was based on the six National Association of Agricultural Educators (NAAE) regions and encompassed six regions (see Table 6). Thirteen percent (n = 69) of the respondents were from Region I encompassing the Western states. Region II, found in the Southwest, had the largest percentage of respondents with 25% (n = 135). Eight percent (n = 41) of the respondents were from Region III, the Midwest states and 23% (n = 123) were from Region IV which comprises the North Central states. Region V is found in the Southern part of the U.S. and represented 15% (n = 82) of the respondents while Region VI, the Eastern States, had 16% (n = 83) of the total respondents. There were respondents from each of the fifty states in this study.

The educational level of study participants is shown in Table 7. Education attained included 0.7% (n = 4) associate degrees, 31% (n = 166) bachelor’s, 42% (n = 233) master’s and 26% (n = 138) doctorate and 0.3% (n = 2) other.

Objective two sought to explain the perceptions of agricultural education professionals regarding the purpose of SBAE curriculum. Table 8 summarizes total agricultural education professionals’ perceptions regarding the purpose of SBAE curriculum (n = 533). Self-assessment scores on a 5-point Likert scale showed that agricultural education professionals, as a group, agreed with 14 of the 17 purposes with “teaching leadership skills” (M = 4.29, SD = 0.52) “developing life skills”
(M = 4.66, SD = 0.57), “developing higher-order thinking skills” (M = 4.65, SD = 0.52), and “developing interpersonal communication skills” (M = 4.65, SD = 0.53) being their top choices for the purpose of SBAE curriculum. Participants were uncertain with “providing industry certification/licensing” (M = 3.14, SD = 1.14), “teaching traditional production agriculture” (M = 3.83, SD = 0.89), and “preparing students for technical schools” (M = 3.95, SD = 0.89).
Table 8
*Agricultural Education Professionals’ Perceptions Regarding the Purpose of SBAE Curriculum (n = 533)*

<table>
<thead>
<tr>
<th>The purpose of SBAE curriculum is to…</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>teach leadership skills</td>
<td>4.69</td>
<td>0.52</td>
<td>2.00-5.00</td>
</tr>
<tr>
<td>develop life skills</td>
<td>4.66</td>
<td>0.57</td>
<td>2.00-5.00</td>
</tr>
<tr>
<td>develop higher-order thinking skills</td>
<td>4.65</td>
<td>0.52</td>
<td>2.00-5.00</td>
</tr>
<tr>
<td>develop interpersonal communication skills</td>
<td>4.65</td>
<td>0.53</td>
<td>2.00-5.00</td>
</tr>
<tr>
<td>teach personal development</td>
<td>4.62</td>
<td>0.59</td>
<td>1.00-5.00</td>
</tr>
<tr>
<td>teach agricultural literacy</td>
<td>4.62</td>
<td>0.61</td>
<td>1.00-5.00</td>
</tr>
<tr>
<td>integrate academic skills in the context of agriculture</td>
<td>4.56</td>
<td>0.63</td>
<td>1.00-5.00</td>
</tr>
<tr>
<td>teach non-traditional agriculture</td>
<td>4.49</td>
<td>0.58</td>
<td>2.00-5.00</td>
</tr>
<tr>
<td>encourage wise management of the environment</td>
<td>4.45</td>
<td>0.59</td>
<td>2.00-5.00</td>
</tr>
<tr>
<td>increase awareness of global agriculture</td>
<td>4.45</td>
<td>0.63</td>
<td>2.00-5.00</td>
</tr>
<tr>
<td>prepare students for careers in agriculture</td>
<td>4.40</td>
<td>0.70</td>
<td>2.00-5.00</td>
</tr>
<tr>
<td>prepare students for college/university</td>
<td>4.40</td>
<td>0.67</td>
<td>2.00-5.00</td>
</tr>
<tr>
<td>cultivate student entrepreneurship</td>
<td>4.19</td>
<td>0.71</td>
<td>2.00-5.00</td>
</tr>
<tr>
<td>Teach occupational skills</td>
<td>4.39</td>
<td>0.76</td>
<td>1.00-5.00</td>
</tr>
<tr>
<td>prepare students for technical schools</td>
<td>3.95</td>
<td>0.89</td>
<td>1.00-5.00</td>
</tr>
<tr>
<td>teach traditional production agriculture</td>
<td>3.83</td>
<td>0.89</td>
<td>1.00-5.00</td>
</tr>
<tr>
<td>provide industry certification/licensing</td>
<td>3.14</td>
<td>1.14</td>
<td>1.00-5.00</td>
</tr>
</tbody>
</table>

*Note.* Self-assessments scored on a 5-point scale (1=definitely disagree, 2=disagree, 3=uncertain, 4=agree, 5=definitely agree).

**Conclusions, Implications, Recommendations**

In this study a majority of respondents were SBAE teachers; which are representative of the stratified, proportional sampling method that was used to select the frame. It was concluded, from the results of the demographic information in this study, that teacher educators have the most experience in agricultural education followed closely by state agricultural education program leaders. Teacher educators also had the highest age among the subgroups studied. It was also concluded that a majority of agricultural education professionals responding were male. The SBAE teacher subgroup reported the largest number of female respondents, followed by state agricultural education professionals and then teacher educators. It was also concluded that a Masters degree was the average degree attained by agricultural education professionals. Finally, the largest number of respondents for this study came from Region II (Southwest states) and the least amount of respondents came from Region III (Midwest States).

It concluded that agricultural education professionals have a general consensus regarding the purpose of SBAE curriculum. Specifically, all three subgroups agreed that teaching leadership skills is a high-priority purpose of SBAE curriculum followed closely by developing life skills, higher-order thinking skills and interpersonal communication skills. It was also concluded that teaching personal development and agricultural literacy were purposes of SBAE curriculum. Integrating academic skills in the context of agriculture, teaching non-traditional agriculture, encouraging wise management of the environment and increasing awareness of global...
agriculture were also agreed upon as being purposes of SBAE curriculum. Preparing students for careers in agriculture and for college/university and cultivating student entrepreneurship were the final elements agreed upon by the agricultural education professionals as being purposes of SBAE curriculum. Another conclusion was that agricultural education professionals were unsure as to whether SBAE curriculum should prepare students for technical schools, teach traditional production agriculture or provide industry certification/licensing.

Based on the findings of this study, there are numerous recommendations that should be taken into consideration by agricultural education professionals regarding the future of SBAE curriculum. With seventeen different characteristics being considered, the task of recommendations can be daunting; however, this study has provided insight as to which characteristics are the most important. It is important to consider the fact that these seventeen characteristics are the result of consolidating nearly seventy-five separate goals that were discovered among different entities regarding the purpose of SBAE curriculum (The National FFA Organization, 2008; Association for Career and Technical Education, 2003; National Council on Vocational Education, 1990; National Council for Agricultural Education, 2000; National FFA Organization, 2001; National FFA Organization, 2003; National FFA Organization, 2007; National Council for Agricultural Education, 2007). In the following recommendations, it is implied that SBAE teachers will be directly responsible for teaching SBAE curriculum to secondary students. It is further implied that teacher educators will be responsible for teaching and training prospective SBAE teachers regarding the proper use and instruction of SBAE curriculum. Finally, it is implied that state agricultural education program leaders will be responsible for a multitude of tasks including designing new programs and providing leadership to SBAE teachers and teacher educators as they continuously update SBAE curriculum and teacher preparation programs.

Based on the finding of this study, SBAE curriculum should include more information regarding global agricultural issues. The existing curriculum needs to be updated to provide this information and teacher educators need to place more emphasis on the importance of teaching global agriculture. In an effort to meet the goals of the strategic plan for agricultural education (National Council for Agricultural Education, 2000), SBAE teachers need to ensure that global agriculture information is being taught to students. Finally, the National Council for Agricultural Education and The National FFA Organization should implement some type of program that would encourage students to learn more about the importance of global agriculture.

More higher-order thinking skills, such as critical thinking, problem solving, analysis and decision making, should be incorporated in SBAE curriculum. Teacher educators need to ensure that student teaching interns are given the opportunity to learn, utilize, and demonstrate higher-order thinking skills. It is also recommended that all agricultural education professionals support Project Lead the Way that is encouraging the concept of higher-order thinking skills in education.

Based on the finding of this study, teaching students life skills has become an important purpose for SBAE curriculum; thus, SBAE curriculum needs to continue to provide students with skills that will enable them to deal with demands and challenges of the real world. More emphasis should also be placed on money management and organization.
SBAE curriculum should also include more interpersonal communication skills. Teaching students the importance of using words to impart information or ideas, proper speaking techniques, and correct use of mail, email, and telephone are important skills that are needed by today’s SBAE students. Teaching professionalism when using these different forms of interpersonal communication is a skill that is vital to the future success of students regardless of their occupation or role in society.

Teaching personal development skills is another curricular purpose that has been given credibility. SBAE curriculum needs to emphasize the importance of developing ethics, improving self, defining goals, aspirations, values and morals, as well as improving one’s lifestyle in regard to health, wealth, family, community and friends.

Agricultural literacy should continue to be emphasized in SBAE curriculum. It is also recommended that agricultural education professionals encourage the education of agricultural literacy to all students, as well as adults and youth. These professionals should also encourage participation in a plethora of agricultural literacy programs that have been created to fulfill this need. Finally, state agricultural education staff needs to continue developing agricultural literacy programs that emphasize the importance of basic agricultural facts and lessons.

A continued effort should be given to the integration of academic skills into SBAE curriculum. Based on prior research, integrating academics into SBAE curriculum improves the rigor and relevance of SBAE curriculum and helps students acquire a better grasp of the academic skills being taught. It is also recommended that the agricultural education professionals continue to support initiatives such as the Curriculum for Agricultural Science Education (CASE) initiative that encourage academic integration into SBAE curriculum.

Teaching more non-traditional programs is a recommendation that will allow SBAE curriculum to meet the demands for a modern society. Realizing that production agriculture accounts for only 2% of the agricultural industry workforce, it is imperative that agricultural education professionals develop new programs that parallel the industry demands. It is also recommended that agricultural education professionals encourage SBAE professionals to continually develop new programs that will encourage students to participate in SBAE classes. SBAE teachers are encouraged to introduce new and modern classes that are interesting and significant to students.

Findings from this study justify the recommendation that SBAE curriculum encourage wise management of the environment. Agricultural education professionals need to introduce more curricula that deals specifically with environmental issues and they need to incorporate environmental issues into curricula that are currently in place. Furthermore, additional educational programs need to be created that encourage students to become involved in environmental education.

Although agricultural education professionals in this study were undecided as to the importance of preparing students for technical schools, they were in agreement that preparing students for college/universities should be a purpose of SBAE. The United States Department of Education (2004) used the reauthorization of the Carl D. Perkins Act to emphasize the importance of preparing every student for an education beyond high school; therefore, it is recommended that agricultural education professionals continue research into the value of post-secondary schooling.
and that research be done on why there is tension between college prep and tech prep programs. It is further recommended that research be conducted regarding SBAE curriculum and its ability to prepare students for post-secondary and technical schools.

Another recommendation for SBAE curriculum is that it continues to provide occupational skills. These skills need to provide SBAE students with employability skills that will enable them to gain employment within the agricultural industry. It is also recommended that these employability skills be extended to include skills necessary for job interviews, resume building and filling out applications. Multiple researchers have claimed that occupational skill training is vital to the success of students; therefore, it is imperative that these skills be taught in SBAE curriculum.

Finally, agricultural education professionals were unsure as to whether SBAE should provide industry certification/licensing when appropriate. It is recommended that agricultural education professionals become more involved with vocational certification, such as Virginia’s Path to Industry Certification that encourages students who are not interested in post-secondary work to earn industry certification in an effort to be more marketable when entering the workforce.

References


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Exploring Oregon Agriculture Teachers’ Perceptions and Integration of Common Core Standards

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Abstract

The Common Core standards represent a shift in the American education system. Included in the Common Core standards are opportunities for agriculture teachers to integrate math and English language arts content into their curriculum. Using the theory of planned behavior, we sought to identify agriculture teachers’ attitudes, familiarity with, current level of integration, and professional development needs related to the Common Core standards. Our research identified the majority of Oregon teachers were somewhat familiar with the Common Core standards. Additionally, teachers had varying levels of agreement that the Common Core standards would help their teaching, yet the majority of agriculture teachers in our study reported they had somewhat implemented the Common Core standards into their teaching. Additionally, we used the existing common core standards to develop 11 needs assessment competencies related to the math, reading, and writing. Respondents identified the highest professional development need areas in topics related to developing students’ abilities to write and do mathematics problems in the context of agriculture. These findings are discussed using the theory of planned behavior; recommendations for practice and future research are also highlighted.

Introduction & Theoretical Framework

The American education system faces a monumental challenge, high school graduates have been labeled as unprepared for both postsecondary schooling and workforce employment (Eisen, Jasinowski, & Kleinert, 2005; Wirt et al., 2004). In an effort to remedy this dilemma, a collaborative team representing educators, researchers, community members, and national organizations worked to develop the Common Core standards (Kendall, 2011). The Common Core standards are a rigorous set of academic benchmarks for K-12 students in the areas of English language arts (ELA) and mathematics (Common Core State Standards Initiative, 2010a; Common Core State Standards Initiative, 2010b; Kendall, 2011; Rothman, 2011). The release of the Common Core standards in 2010 represented a significant shift in the landscape of American education (Porter, McMaken, Hwang, & Yang, 2011; Rothman, 2011). The establishment of the Common Core standards sought to accomplish three important criteria: homogenize academic standards across states, hold American students to the same high academic standards as students in academically exceptional countries, and prepare students to be successful in postsecondary education and a global workforce (Kendall, 2011).

As of 2013, 44 states have adopted the Common Core standards (Achieve, 2013). Those states that have not adopted the Common Core standards include Alaska, Nebraska, North Carolina, and Texas. Indiana had previously adopted the standards, but opted out in 2014. Minnesota has adopted the English language arts standards, but has not adopted the mathematics standards.
Within the 44 adopting states, the timeline for full implementation is variable, with some states fully implementing the Common Core standards as early as the 2011-2012 school year and other states planning full implementation of the standards during the 2014-2015 school year, with the latter group including Oregon (Achieve, 2013).

One important consideration, especially for the agricultural education profession, is the implementation of the Common Core standards in subject areas other than math and ELA. The mathematics Common Core standards are written to guide the development of students’ mathematics skills within typical math subject areas (Common Core State Standards Initiative, 2010b). However, included in the mathematics Common Core are standards for mathematical practice which “describe varieties of expertise that mathematics educators at all levels should seek to develop in their students” (Common Core State Standards Initiative, 2010b, p. 6). Disciplines like agricultural education, which include mathematics principles in their curriculum (Stripling, Roberts, & Stephens, 2014), may consider the adoption of these standards to help inform their integrated teaching (Meeder & Suddreth, 2012; Pearson et al., 2010). The ELA Common Core standards take a more direct route to guide the teaching of ELA content outside of traditional ELA classrooms. Included in the ELA Common Core standards are specific reading and writing competencies for science and technical subjects (Common Core State Standards Initiative, 2010a).

Research has identified career and technical education as a viable context for increasing students’ knowledge in math and ELA (Pearson et al., 2010). Furthermore, agricultural education has been identified as an applicable context for the integration of traditional core academic content (Edwards & Ramsey, 2004; Myers & Dyer, 2004; Nolin & Parr, 2013; Phipps, Osborne, Dyer, Ball, 2008). The effectiveness of agricultural education as a method for developing students’ math and ELA skills can be found in a 2013 study conducted by Nolin and Parr. This research identified a positive relationship between the number of agriculture courses students had taken and their mathematics and ELA scores on a standardized exam. Furthermore, a pair of studies identified that career and technical teachers who intentionally integrated core academic subject matter into their curriculum were more effective in developing the math (Pearson et al., 2010) and ELA skills (Park, 2012) of their students. These studies identify the importance of the teacher’s decision to integrate traditional core academic content in building the math and ELA skills of their students.

While research identifies the importance of the agriculture teacher in the success of their students learning math and ELA content, there exists a dearth of studies in agricultural education exploring agriculture teachers’ perceptions of math and ELA integration, even outside the context of the Common Core standards. Although agricultural education teachers’ attitudes toward the Common Core standards have not previously been explored, research outside of agricultural education has investigated the topic. A 2013 study conducted by the Editorial Projects in Education Research Center [EPE], sought to describe practicing teachers’ familiarity with, attitudes toward, implementation of, and preparedness to teach the Common Core standards. This study identified that 78% of responding teachers were familiar with the mathematics standards and 92% of teachers were familiar with the ELA standards. Although teachers were familiar with the standards, they had not participated in an abundance of professional development experiences related to the Common Core standards. Nearly one-third of respondents in this study reported spending one day or less of professional development...
related to the implementation of the Common Core standards. Furthermore, the majority of responding teachers, 56%, identified that the curriculum they were using was not aligned with the Common Core standards. Overall, teachers in this study felt ill-prepared to teach the Common Core standards, especially to English-language learners and students with learning disabilities. However, teachers in this study remained optimistic that the implementation of the Common Core standards would improve their teaching strategies, and a total of 87% of the teachers in the study identified that they had already partially or fully implemented the common core into their teaching (EPE, 2013).

The goal of this study is to explore Oregon agriculture teachers’ attitudes toward math and ELA integration through the Common Core standards. The theoretical foundation for this investigation is the theory of planned behavior (Ajzen, 1991). The theory of planned behavior is commonly used to understand human behavior or human’s intention to behave a certain way. Within agricultural education, the theory of planned behavior has been used to explore the attitudes and beliefs of principals (Kalme & Dyer, 2000), counselors (Thompson Jr. & Russell, 1993), parents (Osborne & Dyer, 2000; Thompson Jr. & Russell, 1993) and students (Osborne & Dyer, 2000; Thompson Jr. & Russell, 1993) toward agricultural education. Additionally, researchers in agricultural education have used the theory of planned behavior to explore preservice teachers’ perceptions of barriers to integrating science in their classroom (Thoron & Myers, 2010).

The theory of planned behavior was developed from the theory of reasoned action (Ajzen & Fishbein, 1980). One primary difference separates the two theories. The theory of planned behavior includes perceived behavioral controls as a predictor of behavior intention and behavior (Ajzen, 1991). In addition to perceived behavioral controls, this theory identifies two other determinants to an individual’s intention to behave a certain way: attitude toward behavior, and subjective norm (Figure 1; Ajzen, 1991). Ajzen defines an individuals’ attitude toward the behavior as “the degree to which a person has a favorable evaluation or appraisal of the behavior in question” (1991, p. 188). The second predictor of behavioral intention, subjective norm, refers to the pressure to behave a certain way established by members of society. The final predictor of behavioral intention, as identified by Ajzen, is perceived behavioral control. This is an individuals’ perception of the barriers to executing a certain behavior. Perceived behavioral control can reflect negative consequences of past behavior or roadblocks anticipated when considering new behaviors.
Our study was conducted among agriculture teachers within a state planning to implement the Common Core standards during the 2014-2015 school year (Achieve, 2013). Our study sought to explore these agriculture teachers’ attitudes toward the implementation of the Common Core standards in their curriculum. By exploring agriculture teachers’ attitudes toward Common Core standards, we sought to provide evidence of teachers’ behavioral intentions concerning the implementation of the Common Core standards in the upcoming school year. Additionally, we sought to describe teachers’ current level of Common Core integration in their curriculum as well as the professional development needs agriculture teachers identified related to ensuring students’ success in meeting rigorous mathematics and ELA standards.

**Purpose & Objectives**

The purpose of this research is to describe Oregon agriculture teachers’ attitudes, familiarity, level of implementation, and professional development needs related to the Common Core standards. With the impetus of the Common Core standards being to develop high school graduates prepared for postsecondary education and a global workforce (Kendall, 2011), research into agricultural education teachers’ perceptions related to implementation of these standards addresses National Research Agenda priority 3, “Sufficient Scientific and Professional Workforce That Addresses the Challenges of the 21st Century” (Doerfert, 2011, p. 9). In order to accomplish the purpose of this research, four objectives were developed. These research objectives were:

1. Describe agriculture teachers’ familiarity with the Common Core standards.
2. Describe agriculture teachers’ attitudes towards the Common Core standards.
3. Describe agriculture teachers’ incorporation of the Common Core standards in their teaching.
4. Describe agriculture teachers’ perceived professional development needs related to teaching the reading, writing, and math Common Core standards.
Methods

The target population for this study included all school-based agriculture teachers in Oregon (N = 111) during the 2013-2014 school year. We obtained the names and contact information of agriculture teachers using the 2013-2014 Oregon Agriculture Teacher Directory. A panel of experts in the field of agricultural education vetted the information in the directory to insure its accuracy. Inasmuch as we attempted a census, we made no attempt to generalize the findings beyond the population of teachers in Oregon during the 2013-2014 school year.

The questionnaire was composed of three parts: perspectives about the Common Core standards; Common Core professional development needs; and teachers’ demographic information. Perspectives about the Common Core standards were assessed by a modified version of the National Survey of Teacher Perspectives on the Common Core survey instrument (EPE, 2013). This instrument was designed to identify teachers’ familiarity with, attitude toward, and current incorporation level of the Common Core standards. The second portion of the questionnaire, the Common Core needs assessment, was developed by the researchers. This needs assessment was developed based on the Borich (1980) needs assessment model to assess the perceived ability and importance for a total of 11 Common Core competencies. In order to accomplish this, the 28 Common Core standards relevant to agricultural educators were paired down to 11 succinctly written items. This step was critical to increase response rate by reducing respondent burden.

Individual needs assessment items for the ELA portion of the Common Core needs assessment were developed using the Common Core standards in writing and reading for science and technical subjects (Common Core State Standards Initiative, 2010a). Both the ELA reading and writing components of the Common Core include ten standards that are grouped into four larger themes. These larger themes were analyzed by the researchers, and one needs assessment item was developed based on the combination of standards within the different theme. For example, one theme within the ELA reading Common Core is Key Ideas and Details, the Common Core needs assessment item we developed from this theme states: “Identify the central idea as well as details when reading Agricultural Science and Technology (AST) texts.”

Individual items for the mathematics portion of the Common Core needs assessment were developed for agriculture teachers using the eight standards for mathematical practice found in the Common Core standards (Common Core State Standards Initiative, 2010b). The eight standards for mathematical practice were combined into three themes by the researchers. From these three themes, individual items were developed for the Common Core needs assessment. For example the theme “problem solving” was constructed from the following objectives: make sense of problems and perseverer in solving them, use appropriate tools strategically, and attend to precision when solving problems. Once the eight mathematics standards were categorized into three groups, we developed an individual needs assessment item that reflected the purpose of the standards in each group. For the problem solving theme, the following item was developed “Correctly solve AST related math problems.”

The final Common Core needs assessment included 11 items that were categorized into three subscales: “Reading” (four items), “Writing” (four items), and “Mathematics” (three items). Teachers were asked to rate their perceived importance and perceived ability for each of the 11 competencies using a five-point Likert-type scale ranging from 1 “very low” to 5 “very high.” A
panel of experts in the field of agricultural education established face and content validity for the instrument. A post-hoc reliability analysis of the 11 Common Core competencies section of the instrument had acceptable reliability (Cronbach’s alpha = .93). The individual subscale reliabilities for Reading (Cronbach’s alpha = .84), Writing (Cronbach’s alpha = .91), and Mathematics (Cronbach’s alpha = .95) were also acceptable.

We administered the survey instrument and collected data in December of 2013 using the online survey program Qualtrics. We made five points of contact with participants to elicit responses (Dillman, 2000). The first point of contact was a notification e-mail, the three subsequent points of contact were e-mails requesting participation in the research study. The final point of contact was a phone call to individuals who had not yet responded. A total of 80 useable responses were completed, yielding a 72% response rate. An independent samples t-test was used to check for non-response error by comparing participants who responded after the final two points of contact (late respondents; n = 31) and those who responded prior to the final two points of contact (on-time respondents; n = 49) (Lindner, Murphy, & Briers, 2001; Miller & Smith, 1983). We found no statistical differences between on-time and late respondents for items within the perceptions of Common Core and the assessment of Common Core needs. Therefore, we considered non-response error to be insignificant to this study (Lindner et al., 2001; Miller & Smith, 1983).

We analyzed the data using the Statistical Package for Social Science (SPSS) version 20. The first three objectives were descriptive in nature, and therefore we reported the results as frequencies and percentages. To accomplish research objective four, we calculated mean weighted discrepancy scores (MWDS) for each of the 11 Common Core competencies among each responding teacher. First, a discrepancy score was calculated for each teacher by subtracting their perceived ability score from their perceived importance score for each item. Then, a weighted discrepancy score was calculated by multiplying their discrepancy score by the mean importance rating for each competency. Finally, the MWDS was calculated by taking the sum of the weighted discrepancy scores across respondents and dividing by the number of respondents. The MWDS were ranked in order to identify the top inservice need for the different Common Core areas.

Findings

Respondents to this questionnaire had, on average, 11 years of teaching experience. The largest proportion of teachers identified themselves as first year agriculture teachers (11%). A total of 27 teachers (36%) identified that they were in their first five years of teaching agriculture. Just over half the respondents (53%) were male. Eighty percent of the responding teachers identified attending a traditional agriculture teacher training program. The majority of respondents (52%) indicated they were certified to teach the CASE curriculum, with the most common CASE certifications being in Plant Science and Agriculture, Food and Natural Resources. Respondents indicated teaching a wide variety of agriculture education content, with the most common classes taught being introductory classes in agricultural education, Plant Sciences, Animal Sciences and Food Science.

The first objective of this study sought to describe agriculture teachers’ familiarity with the Common Core standards (Table 1). The majority of teachers reported being somewhat familiar with the Common Core standards for both ELA (63.29%) and Mathematics (60.76%). There
were 10 (12.66%) teachers who indicated they were not familiar with the ELA Common Core standards and 16 (20.25%) teachers who indicated they were not familiar with the math standards. Alternatively, 19 (24.05%) teachers identified themselves as being very familiar with the ELA Common Core standards. A lower number of teachers (f = 15; 18.99%), identified being very familiar with the mathematics Common Core standards.

Table 1
Oregon Agriculture Teachers’ Level of Familiarity with the Common Core Standards (n = 79)

<table>
<thead>
<tr>
<th>Item</th>
<th>Not familiar</th>
<th>f</th>
<th>%</th>
<th>Somewhat familiar</th>
<th>f</th>
<th>%</th>
<th>Very familiar</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of familiarity with CC – English,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language, Arts, and literacy</td>
<td>10</td>
<td>12.66</td>
<td>50</td>
<td>63.29</td>
<td>19</td>
<td>24.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of familiarity with the CC –</td>
<td>16</td>
<td>20.25</td>
<td>48</td>
<td>60.76</td>
<td>15</td>
<td>18.99</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. CC = Common Core.

For objective two, we sought to describe agriculture teachers’ perceptions of the Common Core standards (Table 2). Half of the teachers (f = 39; 50.00%) indicated they slightly agreed that the Common Core standards would help improve their instructional practices while another 25.64% (f = 20) indicated they strongly agreed with this statement. The last one-quarter of teachers disagreed with the statement that Common Core would improve their teaching, or did not know.
Table 2
Oregon Agriculture Teachers Perceptions of the Common Core

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly disagree</th>
<th>Slightly disagree</th>
<th>Slightly agree</th>
<th>Strongly agree</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>In general, the CC standards will help me improve my own instruction and classroom practices.</td>
<td>3.84% (3)</td>
<td>12.82% (10)</td>
<td>50.00% (39)</td>
<td>25.64% (20)</td>
<td>7.69% (6)</td>
</tr>
<tr>
<td>I have received adequate training/professional development related to the CC standards.</td>
<td>13.92% (11)</td>
<td>34.18% (27)</td>
<td>36.71% (29)</td>
<td>13.92% (11)</td>
<td>1.27% (1)</td>
</tr>
<tr>
<td>My curriculum materials are aligned with the CC.</td>
<td>5.06% (4)</td>
<td>26.58% (21)</td>
<td>37.97% (30)</td>
<td>24.05% (19)</td>
<td>6.33% (5)</td>
</tr>
<tr>
<td>I feel prepared to teach the CC standards to my students.</td>
<td>12.65% (10)</td>
<td>29.11% (23)</td>
<td>39.24% (31)</td>
<td>18.99% (15)</td>
<td>0.00% (0)</td>
</tr>
</tbody>
</table>

Note. CC = Common Core.

When asked whether they had received adequate training around the Common Core, teachers were almost evenly split between slightly agree (f = 29) and slightly disagree (f = 27) with another 11 teachers indicating they strongly agreed and strongly disagreed that they had received adequate training. A majority (62%) of teachers slightly (f = 30) or strongly (f = 19) agreed that their curriculum materials were aligned with the Common Core. A majority also slightly (f = 31) or strongly agreed (f = 15) they were prepared to teach the Common Core standards in their classrooms, while more than a third of Oregon agriculture teachers disagreed slightly (29.11%) or strongly (12.65%) they were prepared to teach the Common Core standards.

Objective three sought to describe agriculture teachers’ incorporation of the Common Core standards into their teaching (Table 3). A large majority (f = 65; 82.28%) of Oregon agriculture teachers reported they had incorporated the Common Core into some areas of their teaching, but not others. Six teachers (7.59%) reported no incorporation of the Common Core standards into their teaching and an equal number (f = 6; 7.59%) indicated they did not know to what extent the Common Core was incorporated into their practice. There were only 2 teachers (2.53%), at the point of data collection, who reported full incorporation of the Common Core standards in their teaching.
Table 3
Oregon Agriculture Teachers Incorporation for Common Core Standards (n = 79)

<table>
<thead>
<tr>
<th>Response</th>
<th>Fully incorporated into all areas of my teaching</th>
<th>Incorporated into some areas of my teaching, but not others</th>
<th>Not at all incorporated into my teaching</th>
<th>I don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incorporation of the CC into teaching practice</td>
<td>2</td>
<td>2.53</td>
<td>65</td>
<td>82.28</td>
</tr>
</tbody>
</table>

Note. CC = Common Core.

Objective four sought to describe agriculture teachers’ perceived professional development needs related to teaching the Common Core standards. The areas of highest need were identified through a combination of perceived importance and competence using mean weighted discrepancy scores (MWDS). We grouped the items into tables by Common Core areas, which we reported from highest need for professional development to the lowest.

As it relates to Common Core standards for reading, we found the highest perceived need for professional development was helping students identify the central idea and details when reading an agricultural science and technology text. Even though this was the largest perceived need, the MWDS was not high (MWDS = 1.86) (See Table 4). The lowest need was related to developing students’ ability to identify the relationships between commonly used Agricultural Science and Technology (AST) terms (MWDS = 1.00).

Table 4
Agriculture Teachers’ Perceived Professional Development Needs in Teaching Reading Common Core

<table>
<thead>
<tr>
<th>Reading Standard</th>
<th>MWDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop students’ ability to...</td>
<td></td>
</tr>
<tr>
<td>Identify the central idea as well as details when reading Agricultural Science and Technology (AST) texts.</td>
<td>1.86</td>
</tr>
<tr>
<td>Critically analyze information from a variety of sources.</td>
<td>1.82</td>
</tr>
<tr>
<td>Comprehend grade specific AST texts.</td>
<td>1.41</td>
</tr>
<tr>
<td>Identify the relationships between commonly used AST terms.</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note. AST = Agricultural Science and Technology.

As it relates to training in Common Core writing standards, the highest need for teacher professional development was in developing students’ ability to present knowledge through research projects (MWDS = 2.47) (see Table 5). The lowest need, related to the Common Core writing standards, was developing students’ ability to write AST specific content in a variety of forms (MWDS = 2.19).

Table 5
Agriculture Teachers’ Perceived Professional Development Needs in Teaching Writing Common Core

<table>
<thead>
<tr>
<th>Writing Standard</th>
<th>MWDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop students’ ability to...</td>
<td></td>
</tr>
<tr>
<td>Present knowledge through research projects in AST.</td>
<td>2.47</td>
</tr>
<tr>
<td>Engage in a variety of writing exercises in AST.</td>
<td>2.34</td>
</tr>
<tr>
<td>Produce quality writings related to AST.</td>
<td>2.20</td>
</tr>
<tr>
<td>Write AST specific content in a variety of forms.</td>
<td>2.19</td>
</tr>
</tbody>
</table>

*Note. AST = Agricultural Science and Technology.*

Lastly, teachers were asked about the competence and importance related to the Common Core mathematics standards (See Table 6). The highest need for professional development was in developing students’ ability to identify the most efficient method for solving math problems in agriculture (MWDS = 2.64) while the lowest need in mathematics was in developing students’ ability to correctly solve AST related math problems (MWDS = 2.01).

Table 6
Agriculture Teachers’ Perceived Professional Development Needs in Teaching Mathematics Common Core

<table>
<thead>
<tr>
<th>Mathematics Standard</th>
<th>MWDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop students’ ability to...</td>
<td></td>
</tr>
<tr>
<td>Identify the most efficient method for solving math problems in agriculture.</td>
<td>2.64</td>
</tr>
<tr>
<td>Construct viable arguments using mathematics.</td>
<td>2.43</td>
</tr>
<tr>
<td>Correctly solve AST related math problems.</td>
<td>2.01</td>
</tr>
</tbody>
</table>

*Note. AST = Agricultural Science and Technology.*

Conclusions, Implications & Recommendations

The Common Core standards in ELA and mathematics represent an effort to increase the achievement of students throughout the American education system. Our research sought to explore Oregon agriculture teachers’ attitudes, current integration level, and professional development needs related to the Common Core standards. Research objective one examined teachers’ familiarity with the Common Core standards. Results revealed a majority of teachers were familiar with both the ELA and mathematics standards. However, 20% of the respondents indicated they were not familiar with the Common Core math standards and 13% indicated no familiarity with Common Core ELA standards. While the Common Core standards are new, it is nevertheless disconcerting that there are agriculture teachers with no familiarity with these standards. As a discipline, agricultural education is often touted as a subject area that integrates traditional core subjects. If the goal of the Common Core is that all teachers integrate these standards in their classroom, the first step is that all teachers must become familiar with the standards.

While objective one examined familiarity, objective two examined teachers’ perceptions of the Common Core standards. Specifically, we sought to identify the extent to which agriculture teachers’ felt the Common Core standards would help improve their teaching. Overall, only 50% of the respondents indicated they slightly agreed the Common Core would improve their
teaching and 24% disagreed that the Common Core would improve their teaching. These results may be tied to the greater need our teachers have for adequate training in teaching the Common Core standards. Only 36% of responding agriculture teachers slightly agreed they had received adequate training, while 47% either slightly or strongly disagreed that they had received adequate training in the Common Core.

As schools look to implement the Common Core standards, school-based trainings may only target teachers of core subject areas. This may create a void in training, leaving agriculture teachers with few opportunities to explore the implementation of the Common Core standards. We recommend that agriculture teacher educators fill this potential void by becoming familiar with and incorporating the Common Core standards into teacher preparation programs and teacher in-services. This may help to address the current lack of Common Core professional development for practicing teachers. Based on the rate at which different states embrace the Common Core, future research should further explore whether agricultural teachers are adequately trained to implement the Common Core standards and support the learning and testing in the Common Core subject areas.

Agriculture teachers indicated, in objective three, that they do currently incorporate some areas of Common Core into their teaching practice. While this is encouraging, they identified specific professional development need areas in objective four. Agriculture teachers indicated having lesser need in the areas of integrating reading and greater needs in the areas of writing and math integration. Overall, the greatest need areas were in developing students’ ability to identify the most efficient method for solving math problems in agriculture, developing students’ ability to present knowledge through research projects in agriculture science and technology, and developing students’ ability to construct viable arguments using mathematics.

Our research suggests that consideration should be given to the development of initial professional development opportunities related to math and ELA integration to ensure all teachers have an adequate understanding of the Common Core standards. Additionally, research should be conducted to determine professional development experiences that relate to an increase in teachers’ perceptions of mathematics and ELA integration through the Common Core standards. We also acknowledge the dearth of available research examining agriculture teachers’ perceptions related to the integration of math and ELA concepts. We recommend future research exploring agriculture teachers’ perceptions, perhaps outside of the context of the Common Core, especially given the links between attitude toward behavior, behavioral intention (Ajzen, 1991), level of academic integration, and student success (Park, 2012; Nolin & Parr, 2013).

Given that research supports agricultural education as an effective context for the integration of math and ELA skills (Nolin & Parr, 2013; Park, 2012; Pearson et al., 2010), professional development opportunities related to the integration of these subject areas is warranted. Teachers are indicating a need, which agricultural teacher educators can fill through targeted workshops and in-service opportunities on mathematics and ELA skill integration. The theory of planned behavior identifies a link between attitudes and behavior, therefore as Common Core is fully implemented in Oregon during the 2014-2015 school year, efforts must be made to provide professional development experiences that ensure all teachers understand the Common Core and how agricultural education can play a positive role in developing the mathematics and ELA knowledge of students. As a result of increased professional development, teachers may be better
positioned to strengthen the skill sets of students and to advocate for the relevance of their program as a collaborating partner with the core academic subjects.

As this research indicates, agricultural teachers have a basic understanding, but may lack the tools and training to effectively teach to the Common Core standards. While the staying power of the Common Core standards has yet to be determined, it does present agricultural education with yet another opportunity to promote the relevance and importance of our discipline. As we look to the future and explore possibilities for enhancing agricultural education, the ability of our programs to support the curricular core subject areas and enhance test scores may be vital to our continued growth.

References


Source hidden for blind review


Effective Practices in STEM Integration: Describing Teacher Perceptions and Instructional Method Use

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Abstract

Career and Technical Education (CTE), including agricultural education, has been suggested as a viable platform for delivering Science, Technology, Education, and Mathematics (STEM) content in secondary classrooms (Stone, 2011). The purpose of this descriptive study was to describe agriculture teachers’ perceptions and confidence levels for integrating each of the four STEM disciplines in agricultural education courses, along with perceptions and use of instructional methods for STEM integration. A stratified random sample (n = 280) was drawn from agriculture teachers in three states (N = 1049), one state representing each of the American Association for Agricultural Education (AAAE) regions. Overall, teachers perceived each of the four components of STEM integration as important. Teachers had high levels of confidence in integrating science and mathematics. However, teachers reported lower levels of confidence in integrating technology and engineering. Although teachers reported spending most of their teaching time in lecture (M = 23.46; SD = 15.34) and ranked lecture first in overall confidence, teachers ranked lecture as seventh out of ten in effectiveness for student learning. Differences existed between gender and confidence integrating engineering, along with perceptions of instructional method effectiveness. Results of this study suggested stakeholders in agricultural education should examine which instructional methods are most effective at integrating STEM concepts, and investigate how to increase teacher confidence with effective instructional methods in STEM education.

Introduction

Science, Technology, Engineering, and Mathematics (STEM) education has been a part of the culture of education in the United States since the National Science Foundation (NSF) coined the term in the early 2000s (Duggar, 2010). Educational regulations have begun to dictate STEM integration through mandated testing (Myers & Dyer, 2004). Concerns have arisen that many students, including at-risk and low achievers, have difficulty understanding STEM concepts when taught in standalone courses (Boaler, 1998; Kieran, 1992; Woodward & Montague, 2002). Researchers have pointed to the abstract nature of STEM concepts as a possible barrier to gaining STEM understanding for all students (Stone, 2011; Woodward & Montague, 2002). Career and Technical Education (CTE) courses, including agricultural education, have been considered a viable platform for teaching STEM concepts, because these courses deliver abstract concepts in an applied context, which is shown to increase student understanding (Clark, Parr, Peake, & Flanders, 2012; Stone, 2011). To prepare agriculture students who are ready to meet the scientific professional workforce of the 21st century, as indicated as by research priority three of the American Association for Agricultural Education (AAAE), agricultural education should promote the learning and retention of STEM concepts, using effective teaching methods to facilitate student understanding (Doerfert, 2011).
Teacher attitudes and perceptions of STEM concepts have been examined related to specific STEM disciplines in agricultural education. Many studies have been conducted to investigate the integration of science in agriculture courses (Boone, Gartin, Boone, & Hughes, 2006; Brister & Swortzel, 2009; Clark, et al., 2012; Conroy, Dailey, & Shelley-Tolbert, 2000; Haynes, Robinson, Edwards, & Key, 2012; Johnson, 1996; Myers & Thompson, 2006; Myers & Washburn, 2006; Ricketts, Duncan, & Peake, 2006; Scales, Terry, & Torres, 2009; Thompson & Balschweid, 1999; Thompson & Balschweid, 2000; Thoron & Myers, 2012a, 2012b; Warnick, Thompson, & Gummer, 2004). Results of these studies highlighted the notion that agriculture teachers believe agriculture is an effective delivery method for science (Brister & Swortzel, 2009); agriculture teachers are confident in their ability to integrate science concepts (Scales, Terry & Torres, 2009; Thompson & Balschweid, 2000), and agriculture classes are often more effective at increasing student science scores than standalone science courses (Clark, et al. 2012; Myers & Dyer, 2006; Ricketts, et al., 2006).

Mathematics as a component of STEM education in agriculture classes has also been examined (Clark, 2013; Parr, Edwards & Leising, 2006, 2009; Shinn et al., 2003; Stripling & Roberts, 2012). Parr, Edwards, and Leising (2006) found students who engaged in a math integrated agricultural power and technology class scored higher on a postsecondary math placement test. In contrast, Clark (2013) found students who completed a math-enhanced unit in an animal science course showed no improvement in overall math test or self-efficacy scores.

With the exception of biotechnology, which is widely considered a science concept (Pisano, 2006), minimal research has been conducted related to integration of technology in agriculture courses. Dexter, Doering, and Ridel (2006), proposed models for integration of technology content in high school agriculture courses. The study was limited to curriculum development, rather than teacher perceptions and beliefs. A review of available literature yielded no obvious research related to agriculture teachers’ perceptions or efficacy related to integrating engineering within secondary agriculture courses.

The educational literature supports increased focus on STEM concepts, although there are differing views on the instructional methods for teaching those concepts. In a 2007 report, the US Department of Education Academic Competitiveness Council concluded that “despite decades of significant federal investment in science and math education, there is a general dearth of evidence of effective practices in STEM education” (p. 3). To more effectively integrate STEM concepts into all secondary classes, including agricultural science courses, quality research into effective practices must be conducted (Stone, 2011).

Effective instruction in STEM concepts relies on the use of effective instructional methods. Instructional methods can be defined as the specific techniques used to present educational content (Cronbach & Snow, 1981). Researchers have concluded that instructional methods are one of the largest determinants of student attention, learning, and retention (Marzano, Pickering & Pollock, 2001; Reigeluth, 2013; Sallee, Edgar, & Johnson, 2013). Lecture is the instructional method found to be used most frequently in general education, followed by cooperative learning and discussion (Wilens, Ishler, Hutchinson, & Kindsvatter, 2000).

In agricultural education, certain instructional methods have been examined with regard to student performance (Boone, 1990; Dyer & Osbourne, 1996a, 1996b; Parr & Edwards, 2004;
Much of the analysis of instructional methods in secondary agriculture courses has been related to the effectiveness of inquiry-based and problem-solving approaches to content delivery. (Boone, 1990; Parr & Edwards, 2004; Thoron & Burleson, 2014; Washburn & Myers, 2010) Although the effectiveness of several instructional methods has been addressed, a comprehensive review of agricultural education-related literature revealed a gap in the knowledge base related to the instructional methods agriculture teachers are currently using to address student learning objectives. In addition, little is known related to teacher perceptions of instructional method effectiveness.

The aim of this study was threefold: 1) Describe teachers’ perceptions of STEM education holistically, 2) Describe teachers’ confidence in their ability to integrate the four components of STEM content; and 3) Identify the instructional methods agriculture teachers are most self-efficacious in using to deliver content. Understanding how agriculture teachers perceive their ability to integrate STEM concepts, and which instructional methods are being used in secondary agricultural science classrooms, will enable researchers to better determine which STEM integration methods warrant additional research.

Theoretical Framework

To understand how agriculture teachers might better use instructional methods to increase student performance in STEM topics, it is important to examine how individual teacher appraisal is related to both STEM integration and use of instructional methods. Social cognitive theory (Bandura, 1986), as illustrated in Figure 1, served as the grounding theory behind this study. The multi-dimensional interaction between all three factors of social cognitive theory (Bandura, 2002) provided a foundation for the examination of agriculture teacher selection of instructional methods to integrate STEM concepts in agriculture courses.

![Figure 1. Model of social cognitive theory as related to examination of teacher STEM integration (Adapted from Bandura, 2002)](image)

Bandura (1986) noted that humans are self-regulating and self-organizing. Bandura (1986) also described human functioning as the interaction between personal, environmental, and behavioral factors. For the purposes of examining teacher perceptions of STEM and instructional methods,
the desired behavioral outcome would be the successful use of instructional methods to teach STEM concepts.

Personal factors included in social cognitive theory include outcome expectations and self-efficacy. Bandura (1997) described self-efficacy as a person’s “beliefs about their capabilities to produce designated levels of performance” (p. 1). According to Bandura’s (1997) explanation of social cognitive theory, those with higher levels of self-efficacy are more confident in their ability to overcome challenges and endure setbacks within a given subject, and that those with more confidence in their control over the situation are more likely to effectuate a desirable outcome. Therefore, teachers with greater levels of self-efficacy related to STEM integration are more likely to see themselves successfully implementing science, technology, engineering, and/or mathematics in their agriculture courses. In addition, teachers who have greater levels of self-efficacy for a given instructional method are more likely to successfully use that method to effectuate student learning.

Based on the framework of social cognitive theory, environmental determinants also play a role in the successful integration of STEM concepts. Bandura (1997) explained that environmental determinants are likely to play a role in cognition and outcome behavior. Type of certification, gender, and length of teaching career are all factors in which each individual interacts with their peers influencing their social environment. This social environment affects outcome behavior related to confidence in integrating STEM concepts and preferential use of instructional methods. Examining the relationship between the noted environmental factors may provide useful insight into the role that environment plays in STEM integration perception or preference for instructional method among agriculture teachers.

By understanding teacher perceptions of the integration of STEM concepts through the lens of social cognitive theory (Bandura, 1986), further steps can be taken to examine how the interaction between instructional method and STEM integration can be strengthened to create more effective STEM integration in all agriculture courses.

**Purpose and Objectives**

The purpose of this study was to describe agriculture teacher perceptions regarding integration of science, technology, engineering and mathematics in agriculture courses, and identify use and confidence in various instructional methods in agriculture courses.

To meet the purpose of this study, research was conducted with the following objectives:

1. Describe agriculture teacher perceptions of integrating science, technology, engineering, and mathematics components in agriculture courses
2. Determine if relationships existed between social environmental determinants (gender, type of certification, length of teaching career) and perceptions of integrating STEM components in agriculture courses
3. Describe agriculture teachers’ perceptions of instructional methods including preparatory experience, amount of use, confidence in using, and rankings of effectiveness
4. Determine if relationships exist between social environmental determinants (gender, type of certification, length of teaching career) and preference for using specific instructional methods
Instrumentation

To meet the objectives of this study, we developed a three-section online survey instrument. Section one of the instrument asked teachers to report their perception of the importance of each of the STEM areas, and their confidence in integrating each of the STEM areas on a five-point, summated-rated scale. The second section of the instrument asked teachers to select descriptors of their demographic characteristics including age, gender, length of teaching, and type of certification. The third section of the instrument asked teachers to consider their training in, use of, and perception of ten specific instructional methods. Ten instructional methods were selected for incorporation in this study from Newcomb, McCracken, Warmbrod, and Whittington (2004).

Descriptions of each of the instructional methods were included for clarification at the beginning of the third section, and are shown in Table 1. The third section included an item asking which instructional methods teachers received pre-service training in, what percentage of their classroom instruction was spent in each instructional method, and two rank order items: one asking teachers to rank the ten instructional methods in order of their confidence using the method, and one item asking respondents to rank the instructional methods in order of how effectively they believed the method increased student learning.

Table 1

<table>
<thead>
<tr>
<th>Instructional Method</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperative Learning</td>
<td>Learner-centered instruction in which groups of 3-5 students work together on a well-defined learning task</td>
</tr>
<tr>
<td>Demonstration</td>
<td>Teacher led instruction of hands-on skills or activities</td>
</tr>
<tr>
<td>Discussion</td>
<td>Two-way communication about a pre-defined topic conducted with entire class or smaller groups of students</td>
</tr>
<tr>
<td>Experiments</td>
<td>Students using the scientific method to form hypothesis, test theory, and formulate conclusions on a given topic</td>
</tr>
<tr>
<td>Field Trips</td>
<td>Students taken away from traditional classroom setting for real-world experience in a content area</td>
</tr>
<tr>
<td>Guest Speakers</td>
<td>Guests with particular expertise are brought in to instruct about a specific concept or topic</td>
</tr>
<tr>
<td>Independent Study</td>
<td>Students are engaged in self-directed in learning of a topic specific to their interests</td>
</tr>
<tr>
<td>Lecture</td>
<td>Teacher led instruction for disseminating information, may be guided through multimedia presentation</td>
</tr>
<tr>
<td>Role Play (Skits)</td>
<td>Class participants play or portray a given role to illustrate concept</td>
</tr>
<tr>
<td>Supervised Study</td>
<td>Given a well-defined question or prompt, students use resource materials to find answers for themselves</td>
</tr>
</tbody>
</table>

Prior to conducting the study, the instrument was examined by a panel of experts in agricultural education, including secondary agriculture teachers who were not included in the study and university faculty in agricultural education for content and face validity. To ensure reliability, the instrument was piloted to 78 secondary agriculture teachers in four states (Illinois, Nevada, New Mexico, North Carolina) based on AAAE region, including two states in the Western region, one state in the North Central region, and one state in the Southern region. States and
number of pilot participants were selected to mirror the stratification of the three states included in the study population.

Pilot responses on summated-scaled items were used to calculate reliability coefficients by construct, resulting in \( \alpha = 0.70 \) for scaled items related to perceived importance, and \( \alpha = 0.74 \) for scaled items related to teacher confidence STEM. Post-hoc reliability for the constructs was calculated at \( \alpha = 0.79 \) and \( \alpha = 0.75 \). According to Nunnally (1978), a Cronbach’s alpha of \( \alpha = 0.70 \) or higher is sufficient in the initial stages of instrument development, and the instrument was deemed to have appropriate levels of reliability to meet the objectives of this study.

**Methods**

The objectives of this study were accomplished through descriptive survey methods. Agriculture teachers from Georgia, Missouri, and Utah \( (N = 1049) \) were purposively selected as the population for this research, one state representing each of the American Association for Agricultural Education (AAAE) regions. A stratified random sample of \( n = 280 \) agriculture teachers (Missouri \( (n = 135) \), Georgia \( (n = 112) \), and Utah \( (n = 33) \)) were selected from the population to complete the instrument and take part in the research study. From the sample, 127 useable responses were collected, for a 45.4% response rate. To ensure that no single state had an uneven influence based on responses, responses were compared between states using a Chi Square test. Results indicated there were no differences by state, which supported the decision that no state had a weighted influence on findings.

The Tailored Design Method (Dillman, Smyth, & Christian, 2009) procedures were followed to maximize response rate. Respondents were contacted through a pre-survey notification by email, followed by an email including a unique link to the online survey. Two follow-up/thank you letters were sent by email. To control for non-response error, early and late responders were compared (Linder, Murphy, & Briers 2001). No significant differences were found between those who completed the survey prior to the first reminder \( (n = 44) \), and those completing the survey following the reminder email \( (n = 81) \).

Although the previously noted steps were taken to ensure a methodologically sound approach to this study, several limitations and assumptions exist. To accurately assess agriculture teacher use of instructional methods, it was assumed that respondents identified the instructional methods with the definitions as listed in the instrument. In addition, although data from more than 125 agriculture teachers were included in the analysis, the relatively low response rate of this study leave researchers to suggest caution in widespread generalization of the findings of this study. Data were collected from the online survey hosting site, and analyzed using IBM™ SPSS® Version 20.

**Subject Characteristics**

Demographic characteristics of respondents are described in Table 2. The makeup of the respondent group was 55.6% male \( (n = 70) \), and 44.4% female \( (n = 56) \). Mean age of respondents was 35.4 years old \( (SD = 9.83) \). Related to certification type, 91.3% \( (n = 116) \) of respondents reported being certified through a traditional university teacher education program and 8.66% \( (n = 11) \) of respondents obtained certification through an alternative or emergency
certification program with an average of 9.96 (SD = 9.34) years of teaching experience. To further describe length of teaching, respondents were categorized by length of teaching into three categories: beginning (0 – 5 years of experience), early career (6 – 10 years of experience), veteran teachers (11 or more years of experience).

Table 2
Subject Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>f</th>
<th>%</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>70</td>
<td>55.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>56</td>
<td>44.44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td>35.45</td>
<td>9.83</td>
</tr>
<tr>
<td>Type of Certification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional</td>
<td>116</td>
<td>91.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternative/Emergency</td>
<td>11</td>
<td>8.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years of Teaching Experience</td>
<td></td>
<td></td>
<td>9.96</td>
<td>9.34</td>
</tr>
<tr>
<td>Teaching Experience by Category</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginning Teachers (0 – 5 years)</td>
<td>50</td>
<td>39.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mid-Career Teachers (6 – 10 years)</td>
<td>29</td>
<td>22.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Veteran Teachers (11 or more years)</td>
<td>45</td>
<td>35.44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Reported</td>
<td>3</td>
<td>2.36</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Findings

To accurately describe teacher perceptions related to the integration of STEM concepts and use of instructional methods, five research objectives guided this study. The first research objective was to describe agriculture teacher perceptions of integrating all four components of STEM education. To meet this objective, responses to the first section of the survey instrument were analyzed. Respondents were asked to rate how important they perceived it was to integrate each of the concepts of STEM into agriculture courses on a five-point, summated-rated scale, with higher values indicating greater perceived importance. Results of STEM importance rankings are shown in Table 3.

Table 3
Teacher Perceptions of the Importance of Integrating STEM Concepts

<table>
<thead>
<tr>
<th>STEM Component</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science</td>
<td>4.70</td>
<td>0.56</td>
</tr>
<tr>
<td>Technology</td>
<td>4.48</td>
<td>0.67</td>
</tr>
<tr>
<td>Engineering</td>
<td>3.86</td>
<td>0.94</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4.44</td>
<td>0.67</td>
</tr>
</tbody>
</table>

With regard to importance of integrating STEM concepts, respondents found science (M = 4.70, SD = 0.56) to be the most important, although engineering was rated the lowest in importance (M = 3.86) and had the most dispersion in reported scores (SD = 0.94). It is important to note that even though variation in the importance ratings for the four concepts varied, overall rankings for importance of all four concepts was high (M = >3.8).
Respondent confidence in integrating each of the STEM concepts was also examined with responses to a summated-rated response item. Results for confidence in integration are shown in Table 4. In general, agriculture teacher confidence in integrating STEM concepts was lower than perceived importance, and had more variation in responses. Teachers believed they were most confident in integrating science concepts \( (M = 4.28, SD = 0.88) \) and least confident in integrating engineering concepts \( (M = 2.89, SD = 1.20) \).

<table>
<thead>
<tr>
<th>STEM Component</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science</td>
<td>4.28</td>
<td>0.88</td>
</tr>
<tr>
<td>Technology</td>
<td>3.89</td>
<td>0.84</td>
</tr>
<tr>
<td>Engineering</td>
<td>2.89</td>
<td>1.20</td>
</tr>
<tr>
<td>Mathematics</td>
<td>3.77</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Research objective two included determining if differences existed between environmental determinant categories and perceptions of STEM integration. To analyze the relationship between gender and rankings of importance and confidence, independent samples t-tests were calculated. As this study included multiple t-tests, Bonferroni’s adjustment was used to adjust the significant alpha level (Howell, 2012). Using the adjusted alpha level \( (\alpha = .002) \), results yielded one significant difference in ranking related to gender. A significant difference \( (\alpha = .0003) \) was found between gender and confidence in integrating engineering concepts in agriculture courses. To determine practical significance, Cohen’s \( d \) was calculated through an MS Excel based effect size calculator (Thalheimer & Cook, 2002). Cohen’s \( d \) for this ranking was \( d = 0.96 \), which indicates a large effect size (Cohen, 2013). The statistical and practical significance indicators illustrate that female respondents were more likely to rank their confidence lower than males in engineering.

To assess the differences in STEM perceptions related to type of certification, a Mann-Whitney U test was conducted. The Mann-Whitney U test is an acceptable nonparametric test for differences with small sample sizes (Howell, 2012). Because few \( (n = 11) \) respondents identified their certification type as alternative/emergency, the Mann-Whitney U test was determined to be the appropriate tool for analyzing differences in certification type. Comparisons yielded no significant differences \( (p = \leq 0.05) \) between type of certification and STEM perceptions.

Differences between length of teaching category and perceptions of STEM integration were calculated with a one-way ANOVA. As two ANOVA analyses were run from this data set, significance levels were adjusted using the Bonferroni calculation to adjust for Type I error. When variance was compared between the four categories related to length of teaching career and perceptions of STEM concepts, no significant differences were observed.

The purpose of research objective three was to describe agriculture teacher use and perceptions of instructional methods including preparatory experience, amount of use, confidence in using, and rankings of effectiveness. Respondents were asked to report which of the ten instructional methods they had received formal training in during their teacher preparation program. Frequencies and percentages of respondents indicating they had received training for each method are shown in Table 5. All respondents reported receiving formal training in cooperative
learning; however, only 56% of respondents reported formal training in supervised study. In an open-ended response item, respondents also listed inquiry-based \((n = 12)\), case study \((n = 9)\), and problem-solving approach \((n = 8)\) as instructional methods in which they had received formal training.

Table 5

<table>
<thead>
<tr>
<th>Training Received by Instructional Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional Method</td>
</tr>
<tr>
<td>Cooperative Learning</td>
</tr>
<tr>
<td>Discussion</td>
</tr>
<tr>
<td>Role Playing</td>
</tr>
<tr>
<td>Experiments</td>
</tr>
<tr>
<td>Guest Speakers</td>
</tr>
<tr>
<td>Field Trips</td>
</tr>
<tr>
<td>Independent Study</td>
</tr>
<tr>
<td>Lecture</td>
</tr>
<tr>
<td>Supervised Study</td>
</tr>
</tbody>
</table>

Respondents listed the percentage of instructional time spent in each of the instructional methods, as shown in Table 6. Lecture was found to be the most frequently used instructional method \((M = 23.62, SD = 15.01)\), and respondents reported spending the least percentage of their class time using role playing \((M = 2.23, SD = 4.36)\).

Table 6

<table>
<thead>
<tr>
<th>Percent of Class Time Reported Spent in Each Instructional Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional Method</td>
</tr>
<tr>
<td>Lecture</td>
</tr>
<tr>
<td>Demonstration</td>
</tr>
<tr>
<td>Cooperative Learning</td>
</tr>
<tr>
<td>Discussion</td>
</tr>
<tr>
<td>Supervised Study</td>
</tr>
<tr>
<td>Independent Study</td>
</tr>
<tr>
<td>Experiments</td>
</tr>
<tr>
<td>Field Trips</td>
</tr>
<tr>
<td>Guest Speakers</td>
</tr>
<tr>
<td>Role Playing</td>
</tr>
</tbody>
</table>

Agriculture teachers also ranked each of the instructional methods from 1 – 10, in order of their confidence using them. Means of overall ranking were calculated and are reported in Table 7. Lower mean scores show a higher confidence ranking. Respondents reported feeling most confident using lecture \((M = 2.47, SD = 2.07)\) and demonstration \((M = 3.12, SD = 1.84)\) to deliver instruction, and least confident using role playing \((M = 8.55, SD = 1.84)\) and guest speakers \((M = 7.05, SD = 2.20)\).
Table 7
*Agriculture Teacher Confidence Ranking by Instructional Method*

<table>
<thead>
<tr>
<th>Instructional Method</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>2.36</td>
<td>2.07</td>
</tr>
<tr>
<td>Demonstration</td>
<td>3.12</td>
<td>1.84</td>
</tr>
<tr>
<td>Discussion</td>
<td>3.82</td>
<td>2.21</td>
</tr>
<tr>
<td>Cooperative Learning</td>
<td>4.83</td>
<td>2.50</td>
</tr>
<tr>
<td>Supervised Study</td>
<td>5.94</td>
<td>2.37</td>
</tr>
<tr>
<td>Experiments</td>
<td>5.98</td>
<td>2.50</td>
</tr>
<tr>
<td>Independent Study</td>
<td>6.54</td>
<td>2.46</td>
</tr>
<tr>
<td>Field Trips</td>
<td>6.70</td>
<td>2.37</td>
</tr>
<tr>
<td>Guest Speakers</td>
<td>7.05</td>
<td>2.20</td>
</tr>
<tr>
<td>Role Playing</td>
<td>8.55</td>
<td>1.84</td>
</tr>
</tbody>
</table>

To determine respondent perceptions of effectiveness of instructional method, respondents ranked the methods in order from most effective to least effective. Mean scores of effectiveness are shown in Table 8, with lower rankings equating to higher overall ranking. Demonstration ($M = 2.96$, $SD = 2.04$) and experiments ($M = 3.75$, $SD = 2.52$) were the instructional methods ranked as most effective, using guest speakers ($M = 6.91$, $SD = 2.36$) and role playing ($M = 7.27$, $SD = 2.31$) fell to the bottom of the list of effectiveness.

Table 8
*Agriculture Teacher Ranking of Perceived Instructional Method Effectiveness*

<table>
<thead>
<tr>
<th>Instructional Method</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstration</td>
<td>2.96</td>
<td>2.04</td>
</tr>
<tr>
<td>Experiments</td>
<td>3.75</td>
<td>2.52</td>
</tr>
<tr>
<td>Cooperative Learning</td>
<td>4.58</td>
<td>2.92</td>
</tr>
<tr>
<td>Discussion</td>
<td>4.96</td>
<td>2.21</td>
</tr>
<tr>
<td>Field Trips</td>
<td>5.05</td>
<td>2.53</td>
</tr>
<tr>
<td>Supervised Study</td>
<td>6.23</td>
<td>2.81</td>
</tr>
<tr>
<td>Lecture</td>
<td>6.47</td>
<td>2.82</td>
</tr>
<tr>
<td>Independent Study</td>
<td>6.82</td>
<td>2.62</td>
</tr>
<tr>
<td>Guest Speakers</td>
<td>6.91</td>
<td>2.36</td>
</tr>
<tr>
<td>Role Playing</td>
<td>7.27</td>
<td>2.32</td>
</tr>
</tbody>
</table>

Research objective four included identifying relationships between behavioral determinants and instructional method perceptions. To determine relationships based on gender, an independent samples t-test was used. Bonferroni’s adjustment for significant alpha was employed to correct for multiple t-tests, resulting in a significant alpha level of $\alpha = .002$. This analysis yielded two significant differences. Differences in gender occurred with regard to the perceived effectiveness of role playing ($\alpha = .001$) and supervised study ($\alpha = .001$). A medium effect size was found (Cohen, 1988), calculated at $d = 0.60$ for role playing and $d = -0.61$ for supervised study. Female respondents ranked role playing higher in effectiveness, and male respondents ranked supervised study higher in effectiveness.
The examination of differences in certification type was completed through a Mann-Whitney U test. No significant differences were found related to type of certification and use or perceptions of instructional methods. Differences between length of teaching category and instructional method preferences were analyzed with a one-way ANOVA. No significant differences were found between length of teaching categories and ranking of confidence or effectiveness of instructional methods.

Conclusions/Implications

Results supported the use of social cognitive theory (Bandura, 1986) in examining teacher perceptions of STEM integration and instructional method use, as findings revealed interactions between all three determinants related to STEM integration.

Overall, agriculture teacher ratings of the importance of integrating STEM concepts were high, supporting the notion that agriculture teachers are aware of shifts in educational structure mandating integration STEM concepts (Myers & Dyer, 2004). In the framework of social cognitive theory (Bandura, 1986), higher importance ratings are likely to equate with a willingness to focus on STEM integration.

Confidence ratings of ability to integrate concepts varied by content area. The highest confidence level was reported in science, supporting the findings of Scales, Terry, and Torres (2009). Science efficacy scores may be high due to the historical influence of science concepts being embedded within agriculture courses (Hillison, 1996). Engineering was the content area with the lowest rating of both importance and confidence, leading to concerns about agriculture teachers’ ability to effectively integrate engineering concepts. It is important to note that high confidence does not always equate to high ability (Bandura, 1997). Scales, Terry, & Torres (2009), found that even though agriculture teachers rated their ability in integrating science high, they were not technically competent on a test of science knowledge. Examining teacher knowledge related to all four STEM concepts is recommended, and could reveal levels of competence vastly different from levels of confidence.

Significant differences were found both statistically and practically between male and female agriculture teachers confidence in integrating engineering. Engineering confidence has been historically lower for females (Zeldin & Pajares, 2000), and the nature of gender differences may be a factor in this finding. Another possible suggestion for the difference is the relatively low percentage of female teachers instructing courses like agricultural mechanics (Foster, 2001), where engineering concepts may be more easily integrated into existing course content.

Agriculture teachers have been prepared in a wide variety of instructional methods. All agriculture teachers surveyed reported being trained in cooperative learning, perhaps indicating that a consensus has been reached between teacher preparation programs on the importance of training in this method. Although lecture was reported as the instructional method used most in agriculture courses and method with the highest confidence ranking, only 85% of respondents reported receiving training in this method, and respondents ranked lecture as seventh in effectiveness. Similar differences occurred with supervised study, the method ranked lowest in training received, but in the middle of the group with regard to use (fifth), confidence (fifth), and
effectiveness (sixth). Teachers are likely spending time instructing in methods they have not been trained in, and do not believe are the most effective at increasing student understanding.

**Recommendations**

Results of this study highlight several areas for further research and practical application in secondary agricultural education. Related to recommendations for further research, recommendations exist related to both STEM integration and use of instructional methods. STEM integration research should be conducted to determine the reasons that female agriculture teachers are less confident integrating engineering concepts. It is also recommended to replicate this study including a content knowledge component, similar to Scales, Terry, and Torres (2009), to determine if relationships exist between content knowledge and efficacy in each of the components of STEM education.

With regard specifically to instructional method use, it is suggested that the relationships be examined related to factors influencing teacher choice of instructional method. Understanding how teachers select instructional methods could reveal best practices for encouraging agriculture teachers to use more effective methods to deliver content. Differences in perceptions of instructional method effectiveness should be examined related to gender. In addition, it is suggested to replicate this study on a broader scale to determine if the results are generalizable to the national population of agricultural educators. The final suggestion for research emerging from this study is the need for systematic experimental research into the effectiveness of specific instructional methods for student learning and retention of STEM concepts.

This study provides information which can be applied by stakeholders in agricultural education. Teachers rated confidence in integrating technology and engineering as the lowest of the four STEM components. Increasing teacher exposure to the integration of these topics, through either increased pre-service instruction, or professional development in-service training could show an increase in the confidence of teachers in integrating these concepts in agriculture courses.

Effective instruction in STEM concepts will depend on the use of effective instructional methods. Through the examination of teacher perceptions of integrating STEM, an understanding of how agriculture teachers view integration can be used to pinpoint intervention for teachers to ensure they are confident and well qualified to prepare 21st century learners in STEM concepts. In addition, knowing which instructional methods are currently being used in the classroom allows stakeholders a gauge by which to measure effectiveness and confidence, and provides a baseline for the examination of which instructional methods are most effective at helping all students succeed in the STEM realm.

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An Examination of Teachers’ Professional Development Experiences at the Delta Conference

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Abstract

High-quality professional development ensures the retention of teachers. Many who have completed the Delta Conference described the experience as unlike any other professional development they have attended. Is Delta a model for effective agricultural teacher professional development? This phenomenological investigation sought to understand the experiences of four participants in a state level Delta Conference held during the summer of 2013. A description of the Delta conference is included along with a framework of quality professional development proposed by Desimone (2009). Three themes emerged: a) participants experienced the Delta Conference differently than past professional development and inservice activities attended, b) participants experienced challenges being fully present at the Delta Conference, and, c) participants describe their motivation to attend and engage in meaningful PD as intrinsic, but choosing Delta was greatly influenced by others. Recommendations for agricultural teacher education practitioners are included, as well as recommendations for future research.

Introduction and Review of Literature

Educational policy reform often focuses attention on the teachers in the classroom. It is well known there is no other influence on student achievement quite as profound as the teacher (Darling-Hammond & Bransford, 2005). Floden (2001) argued a connection exists between teacher policy studies, how policy changes impact teachers, and what the students of such teachers learn. One of the most important variables in policy aimed at reforming our education system is professional development, hereafter referred to as PD. “High quality professional development is a central component in nearly every modern proposal for improving education. Policy-makers increasingly recognize that schools can be no better than the teachers and administrators who work within them” (Guskey, 2002, p. 381). This statement reinforces the idea that reform cannot fully be realized in the absence of a plan to help teachers enact the strategies called for within reform efforts. With reform in mind, the goal of many PD endeavors is improving student achievement. Likewise, most teachers tend to engage in PD activities to become better in the classroom, believing that expanding their knowledge and skills will lead to such an end goal (Guskey, 2002).

In agricultural education, PD has typically been addressed in terms of the inservice model, similar to the PD schools and districts provide their teachers – usually as a way to kick start each new academic year. However, school inservice activities generally involve limited input from teachers and are heavily driven by administration. Furthermore, these activities are usually delivered in a direct instruction format by outside experts. Teachers generally identify these programs as a waste of time, and find it difficult to connect much of the content covered to their classrooms (Little, 1993). Moreover, a study of 199 teachers in four schools found school- and district-based inservice activities were ranked as lowest in terms of “personal value” among available PD activities (Sandholtz, 2001).
Beyond school-based inservice trainings and conferences, many teachers have input on optional, out of school PD activities. Sandholtz (2001) determined, when given opportunity to provide input on the types of PD activities perceived as most beneficial, teachers were more likely to subsequently rate such experiences as beneficial. In agricultural education, one specific PD activity, the Delta Conference, has emerged as a potential model for how successful PD activities might be conducted. A study by McGregor, Bellah & Coonrod (2008a) revealed Delta teachers were willing to adopt and sustain new teaching strategies and techniques, and teachers reported utilizing effective teaching strategies more regularly. Data from the study also suggested the students of Delta trained teachers tended to achieve at a higher level than a control group of non-Delta teachers. Though more empirical evidence needs to be obtained to generalize the effectiveness of the Delta Conference, these initial studies do show promise in the conference’s efficacy.

**The Delta Conference**
Organized by the National FFA Organization in 2006 as a reform model of PD for agricultural educators, Delta was named and modeled after the greek letter, represented by a triangle. The curriculum is based upon research-based tenets of sound pedagogy (DePorter, Reardon, & Singer-Nourie, 1999). The sides of the Delta triangle represent a) context, b) clarity, and c) conversations with the angles used to signify a) modalities, b) multiple intelligences (Gardner, 1991), and c) use of teacher movement. Within context, there are lessons on framing, transitions and state management based upon students’ brain (Caine & Caine, 1990). The clarity includes instruction on giving quality directions, economizing language and implementing checks for understanding. Lastly, the conversations piece includes instruction on eliciting student responses and processing through activities and student answers.

The Delta Conference is unique by design. Beyond the facilitation and teaching strategies upon which the conference is focused, the conference structure itself is designed to provide teachers with a challenging and rewarding experience. Participants are asked to commit to five days and four nights of intense training and are asked to stay at a hotel away from home throughout the experience to allow full commitment to the experience without home or career distractions. They must stand and deliver portions of lessons repeatedly and receive feedback from peers, and are placed in small teams led by a coach or mentor. The conference is generally led by a head facilitator, but involves the teamwork of several Delta trained experts, volunteers, and university faculty (K. W. McGregor, personal communication, November 7, 2012). This structure has been found to have a profound impact on teachers’ thinking and performance in the field (McGregor et al., 2008a).

In Oregon, a state with 115 agriculture teachers, a Delta Conference was held during the summers of 2012 and 2013. Fourteen agriculture teachers applied and were accepted in 2012 and thirteen teachers attended in 2013. The conference was opened to agriculture teachers in Washington (N = 312) and Idaho (N = 115) due to the low Oregon attendance; no out-of-state teachers heeded the invitation, and the conference was eventually opened to all teachers at the host high school with a handful of English, business, math, and science teachers attending in addition to the agricultural teachers in 2012 (J. Ferro, personal communication, November 13, 2012). At the 2013 conference, only two non-agriculture teachers were in attendance, though five agriculture teachers returned from the 2012 conference to participate in a special Delta II Conference (S. Derner, personal communication, September 9, 2013).
Effective professional development can only be realized by those who actually attend such events. We believe the key to understanding the effectiveness of Delta, why teachers are motivated to attend, and what makes the conference unique lies within the lived experiences of those agricultural teachers who do attend. In a recent review of the literature, we found several gaps that would be relevant to addressing PD in agricultural education; more specifically the Delta Conference, with only three publications on the Delta Conference experience to date (Coonrod, McGregor, & Bellah, 2009; McGregor et al., 2008a; McGregor, Bellah, & Coonrod, 2008b). Moreover, Guskey (2001) summarizes the need for more research in PD overall, stating “we need to explore the specific teacher attitudes and beliefs most crucial to professional growth and development and to find better ways of measuring these variables” (p. 389). With regard to the Delta Conference, we posit the best way to begin investigating teacher attitudes and beliefs is best accomplished through describing their lived experiences at the conference.

**Conceptual Framework**

Many frameworks may be useful in investigating the Delta Conference phenomenon. A national study of 1,027 math and science teachers revealed clearly identifiable characteristics of effective PD (Garet, Porter, Desimone, Birman, & Yoon, 2001). The results of the study led the authors to propose a new model for PD, involving the core and structural features necessary to maximize impact and adoption by teachers. The pieces of an effective PD program should fit together like a puzzle rather than being abstract and disconnected (Garet et al., 2001). Building upon the work she did with Garet et al. (2001), Desimone (2009) focused on a few central tenets of the larger model as they related to the effects of professional development upon teachers and students. Specifically, Desimone (2009) chose to focus on the core features of professional development, which she defined as a) content focus, b) active learning, c) coherence, d) duration, and e) collective participation. These items lead to increased teacher knowledge and skills as well as a change in attitudes and beliefs leading to a change in their instruction and, finally, improved student learning.

The framework from Desimone (2009) of PD features and their relationship to teacher outcomes broadly provided context for this study, though we were careful not to take a post-positivist stance in our investigation. According to Doolittle and Camp (1999), teachers construct knowledge through interaction with their past and current involvement in PD activities, and these activities are situated in a setting where teachers interact with others. This constructivist view with an emphasis on teacher identity could be useful in understanding teachers’ experiences in PD activities, as teachers may identify with or participate through what they perceive as their role as an agriculture teacher. Shoulders and Myers (2011) found “the professional identity secondary agriculture teachers display can affect their receptiveness and interest in different professional development events” (p. 98). In fact, Shoulders and Myers found teachers’ identities may be at odds with the ideals of current reform based agricultural PD activities. For the purposes of this study, we sought to explore the phenomenon of agricultural teachers at the Oregon Delta Conference through their eyes, and as such, cast a wide theoretical lens in which to investigate this phenomenon.

The American Association for Agricultural Education’s Research Priority 4, Meaningful, Engaged Learning, specifically points to a desired key outcome that “learners in all agricultural education learning environments will be actively and emotionally engaged in learning, leading to
high levels of achievement, life and career readiness, and professional success” (Doerfert, 2011, p. 9). If such a model potentially already exists to elevate this research priority to reality, would it not behoove the profession to investigate and implement this model further?

**Purpose and Objectives**

The purpose of this phenomenological investigation was to gain a deeper understanding of the participants’ experiences with the Delta Conference. Specifically, the objectives were: 1) Examine the lived experience of the 2013 Oregon Delta Conference participants through their eyes; 2) Explore the background experiences that might have influenced participants’ choice to attend and participate in Delta; and 3) Explore the background experiences that might have led to the participants’ characterization of the conference.

**Methods and Procedures**

This study was conducted from a phenomenological perspective. Phenomenological studies aim to explore the essence of what people experience and how they experience it with regard to a specific phenomenon (Patton, 1990). Moreover, phenomenologies are designed to explore the lived experiences of individuals with regard to a given context (Creswell, 2013) and to understand “the essence and the underlying structure of the phenomenon” (Merriam, 2009, p. 23). Given the anecdotal knowledge regarding the Delta Conference, our varying experiences with Delta, and the limited existing research on Delta, we chose to share the experience of Delta participants through a phenomenological approach. According to Merriam (2009), many variations exist in terms of how a phenomenology study is executed. For example, van Manen chose to investigate absent of a set of rules or methods, while Moustakas outlines very detailed phenomenological methods for researchers to follow (Creswell, 2013). We chose to follow an empirical phenomenological research approach as described by Moustakas (1994), who emphasized van Eckartsberg’s three-step approach. While most phenomenologies conduct individual interviews, we sought to investigate the conference through a focus group interview.

**Focus Group Participant Selection**

According to Berg and Lune (2008), focus groups “serve as important tools for pure research, studies in which we begin with a research question and use our primary data collection to answer it” (p. 165). Typically, focus groups consist of a small number of participants, usually no more than seven, in order to ensure depth in each individual’s responses. We chose to conduct a focus group to allow a social component to the data collection process, as Berg and Lune (2008) noted, “focus group interviews explicitly use group interactions as part of the data-gathering method” (p. 164). Questions were devised to specifically explore the Delta Conference experience through the eyes of the participants (Creswell, 2013).

We chose our participants purposively to ensure a heterogeneous group (Berg & Lune, 2008). Of the thirteen participants at the 2013 Delta Conference, four participants were chosen in order to ensure a diversity of responses. Through our observations throughout the four day conference, we selected our four focus group participants based upon the following factors: gender, years of teaching agriculture, and ensuring the participants were selected from a variety of conference coaches/teams. The focus group consisted of two females and two males, with teaching
experience ranging from three to twelve years. Pseudonyms have been used to protect the individual identity of the participants.

**Steven:** Steven is a male agricultural teacher in a rural area in Oregon. He has just completed his third year of teaching and obtained his master’s degree and teaching credential through Oregon State University. Steven has been involved in several small, mini-Delta experiences offered by fellow agricultural teachers in his state through the professional agriculture teachers’ association.

**Sally:** Sally is a female agriculture teacher from a medium sized town in central Oregon. Just completing her fifth year of teaching, Sally obtained her master’s degree and license from out of state. Like Steven, Sally has also participated in mini-Delta experiences offered in her state.

**Dave:** Dave, a male agriculture teacher from a small town in central Oregon, just completed his twelfth year of teaching. Dave obtained his master’s degree and license from Oregon State University and, like the first two participants, has been involved in mini-Delta experiences prior to the actual conference.

**Mary:** Mary is unique in that she began her teaching career, then stepped out of the classroom after teaching for eight years to have children. Like the other participants, she obtained her master’s degree and license at Oregon State University. Mary only recently returned to the classroom. She teaches in a large program in a medium-sized town.

**Data Collection**
Both of us conducted the focus group, one serving as the moderator, and the other capturing speaker order and observation notes. Each participant granted us consent through a written agreement, approved as part of our overall Institutional Review Board process. The one-hour session was held on the evening of the fourth day of the five-day conference.

**Data Analysis**
We transcribed the focus group interview from an audio recording. Next, we conducted an initial reading of the transcribed data and listened to the audio recording a second time. Each researcher took analytic notes as we examined the data and reported to each other. As this was a phenomenology, we let the nature of the data guide our analysis and made every attempt to ensure the actual lived experiences of the participants were reported through thick, rich descriptions. After agreeing upon an initial coding schema, we each returned to the data to condense the data into emergent themes. We were in agreement on the emergent themes and the overall phenomenological experience that surfaced through our examination of the data.

We established confirmability and dependability through the use of field notes, analytic notes, and peer debriefing. We provided descriptive data to allow other researchers to determine the transferability of our findings, though Lincoln and Guba (1985) argue transferability is ultimately determined by those seeking to make application of the findings. We have maintained an audit trail of audio recordings, field notes, and line-numbered-transcripts. Moreover, we found the four participants were adequate, with data saturation being reached.
Reflexivity
In order to ensure reliability and trustworthiness in our study, we chose to clearly reflect upon and report our personal experiences and connections to the Delta Conference. According to Hammersley (2000), Phenomenologists believe they cannot research independent of their own presuppositions, and therefore must recognize their studies must reflect the subjectivity inherent within such a stance. Reflexivity acknowledges the effect our own backgrounds have on the process and outcomes of our research (Thorpe & Holt, 2008). Our different backgrounds and experiences with Delta help triangulate our findings and ensure credibility.

Researcher 1: I am currently an instructor and doctoral candidate in Agricultural Education at Oregon State University. I was one of the original participants at the National FFA Delta Conference in 2006 and returned to attend the Delta II Conference the following year. I can definitely see where the conference had a positive impact on my nine years of secondary agriculture teaching, and as such, I have assisted in various capacities in planning and implementing subsequent Delta experiences in California and Oregon as a way of giving back to the profession. My experience with Delta provides a unique context from which to investigate the phenomenon. However, this perspective is balanced with the differing experiences of the other researchers conducting this study.

Researcher 2: I am a teacher educator at Oregon State University. As part of my job, I coordinate some of the professional development opportunities for the states’ agriculture teachers. However, I was not able to take part in a national level Delta Conference so my first experience with Delta was when this state hosted the conference for the first time in the summer of 2012. While included in the planning conversations of the Delta leadership team, I did not facilitate a small group during the conference. I found many of the concepts mirrored the content I was teaching in my graduate instructional teaching methods course, but I have begun to modify my course to implement some of the language used within Delta. I feel this will allow our program graduates to use the same language as the Delta conference alumni in the state.

Limitations
The nature of a qualitative study allows for depth into a few cases, but may limit the generalizability to other people or other settings (Maxwell, 2005). The results of this study are limited to the setting and context described in our procedures. Furthermore, this study describes the experience of four teachers at one of the many aforementioned conferences. We make no attempt to apply our findings to other teachers’ PD experiences; however, we believe our findings will help inform further investigations into the Delta Conference in addition to other PD and inservice activities within our profession.

Findings
Thorough analysis of the data, three significant themes emerged presenting the full experience of the participants. Each theme is supported with the participants’ own stories and in their own words. We have provided explanation for supporting statements requiring context with regard to the conference experience.
Theme 1: The participants experienced the Delta Conference differently than past professional development and inservice activities they attended.

Just as previous studies found teachers tend to construct knowledge from past and present PD experiences (Doolittle & Camp, 1999), our participants shared their past PD experiences, the ways these experiences related to their Delta experience, and the ways PD expectations may have been influenced by the Delta Conference experience.

Referring to Delta, Dave explains his regret he did not have the opportunity to participate earlier in his career.

I just finished my twelfth year, and after today I wish I would have done it earlier. I enjoyed that enlightening moment, where ‘hey, this would be a lot more effective if I did it this way’ and, I’ve had a really enjoyable experience here because of that [6:7, 12:15].

This was further solidified when Dave predicted his sustained use of the concepts experienced through his Delta experience. “The potential of going back to my high school and implementing these strategies...is something that I’m really looking forward to” (153:159).

Steven found the conference to be different than past PD experiences. Referring to a previous PD experience he stated, “I swear to God I’ve seen a PowerPoint with 40 slides on it, and on one of the PowerPoint slides it said that ‘PowerPoint is not the answer; you should not use it’” [194:196]. Comparing these types of past experiences to Delta, he continues to share:

I was sitting next to one of the people at the conference, and I was like, ‘I’m so excited because I know these guys [the facilitators] are going to be trying to use the same skills they’re teaching us while they’re teaching the curriculum’. I could see the teaching strategies happening…I guess that’s kinda where I think Delta’s a little bit different, is that, it’s really genuine in trying to teach us strategies that are going to be best for students [197:201, 202:204]

Sally had a similar experience.

I’ve always felt, so many times, we sit in professional development, and they say ‘you should be engaging, you should do activities, it should be hands on,’ as they’re sitting there lecturing to us. And doing everything that they’re telling us not to do [163:166].

Sally contrasted this to her Delta experience and how it impacted her.

In here we took that same lesson and we taught it, and then we learned a strategy and then we got to implement it, ...to change our lesson, ...we learned a different strategy and ...implemented it. ...We got to practice and then if we still weren’t sure, we had a coach that modeled that for us and said, ‘this is what it’s supposed to look like’ [170:176]

Another participant echoed previous PD experiences as an influencer in her decision-making process.
You get burned going to conferences...it’s easier to say no than to sit through something that you already have a preconceived notion of how it probably is gonna be, even though people are telling you it’s great, it’s always easier to say no [Mary, 216:219].

Mary’s reflections about engagement in the Delta Conference, though, differed from her previous experiences. “I think that the best part about this is the part that forces you to have to try it” [221:222].

Participants differentiated intended outcomes of various PD opportunities, specifically the focus on curriculum versus facilitation.

All the curriculum in the world, which I already have, isn’t going to mean jack if I don’t know how to be confident teaching it...it seems like most of the teachers are here [Delta] because they want to be better for somebody, somebody they admire, look up to, and the students in their program [481:483, 499:502].

Steven agreed.

We live in a world that every bit of curriculum or anything you ever wanted to know is in the palm of your hand…we could just give kids a textbook or just give them an iPad…so, while curriculum is really important…facilitating that knowledge is why we’re employed [506:513].

Participants also expressed their experiences with the format of the conference and the appreciation for feedback and support. “When I got the opportunity to present, work on my own things, and get really valuable feedback; I mean that’s huge” [Steven, 82:83] Sally agreed.

I like the small group sessions, and with having four teachers in a group with a coach I think that really helps with being able to do more and get more feedback...it felt like there was more one-on-one contact, and so I like the work sessions we had to be able to change around our lesson plans and get feedback, and then go to other rooms and get feedback as well. And work with each other and just try to help each other [32:39].

Conference value and sustainability were additional differences from previous PD experiences emerging from the participants, along with a sense of professional stewardship to influence others through workshops. Dave posited “It’s all about student engagement, but it’s here’s how. And I really appreciate that...it all has to go back to keeping kids engaged in what we’re doing...we’re getting tools that help do that” [146:151]. Sally shared a specific example of how she intended to actualize her experience.

I love the poster that we created, because that is something that I could put up, and I was thinking, [as] we were going through e-moments, is that I need to print a list of e-moments, and I need to post it in my office to remind me...I need to pick one to try… or two or three to try in a week [551:555].

Steven was also passionate about applying Delta concepts in his classroom.
I need to change the way I’m doing things, and I need to start implementing these lessons, and so I think it’s gonna keep me honest about things, because now that I know that everyone else has the same knowledge as I have, I’ve gotta apply it [628:631].

Sally indicated part of the implementation process would involve her pursuing other Delta-like PD experiences.

I want to keep going to the next step and keep building on what I’ve already done. If there are opportunities, I want to be involved in those. That’s how good I feel about what I’ve done this week, when is the next thing, what’s on the horizon headed my way [639:642].

Like Sally, Mary similarly expressed interest to continue to be involved in Delta PD opportunities, even volunteering to help facilitate them herself.

I feel value in it, I would love to have a chance to practice some more differently, or help put on a small workshop at ag teachers’ conference, something just to show something, that’s exciting to try and light that fire [662:665]

Dave wanted to implement what he learned and educate his peers about what he learned.

I think that it, for me to take this back to my school and go to the trouble to try it and, actually I’m going to restate that, to be able to do it, and see the benefit it’s gonna have on my kids, my program, my school, I guess what I’d like the opportunity to...stand up in front of everybody else and testify...to the impact that it does have [686:693].

**Theme 2: The participants experienced challenges being fully present at the Delta Conference.**
We use the term present to describe each participant’s level of engagement and focus. Some participants experienced challenges with regard to the conference structure and implementation, perceived self-competence, and the external, non-conference demands that agricultural educators often face. Others felt their lack of specific details about the conference caused some anxiety. Shoulders and Myers (2011) discussed the role agricultural teachers’ professional identity may have in receptiveness to various PD activities. Our participants’ experiences balancing Delta with their other agriculture teacher roles aligns with their findings.

Some uncertainty was expressed throughout the participants in the way their peers influenced them to attend; their trusted peers’ inability to fully describe the experience led them to come, despite not having a full description or understanding of what the conference entails.

I didn’t really know what to expect coming into it... ‘you have to do it, it’s just something you have to do’ (referring to other Oregon ag teachers’ comments)...and didn’t really have a lot of background on why, or what it was, so I didn’t have a lot of expectations coming into it [Dave, 2:6].

Even after attending the conference, participants indicated an inability to fully describe the experience to others they would influence to attend, despite their desire to involve others.
It’s teaching us to be a better teacher, but we’ve all sat through workshops that claim to do that...but definitely a weakness to try to get buy in, because I would have thought...you should be able to get people from out-of-state [Mary, 114:119].

The concept of presence was further challenged when teachers described the experience of developing and presenting lesson materials to their peers.

It’s uncomfortable. There’s a tremendous amount of...pressure, to change very quickly, and that’s tough, after you’ve done something for 12 years, and don’t realize you’re doing it, and then it’s pointed out to you, and that pressure is kind of put on you by yourself to fix it [Dave, 8:12].

Dave goes on to share other difficulties he faced at the conference.

It was a challenge to come here with something that was so basic and have to do all that work, and it was hard on my brain, and I put a lot of thought into what I was doing once we started, and I feel good about what I’ve done [266:269].

Some of the participants found it challenging to engage and focus with the lack of a conference schedule.

we were like, what are we going to do...what are we doing, and what is gonna come next, and sometimes I keep those schedules, and it helps me to remember what we did, and the path we took to build on, and so that can be helpful in me recalling [Sally, 294:302].

Mary expressed similar feelings. “The reality is some of us have a lot less anxiety if we have a schedule, so for some of us... by day three, by today especially, my life is creeping in to my concentration on things” [374:376]. Adding to Mary’s comments, Sally continued to share with specific details about her schedule concerns.

My phone’s been going like crazy, everyone’s like ‘are you back yet’...‘no I’m in [city] and I’ll be back on Friday’ so, but then what I’ve learned though is, it is gonna make me so much better in the classroom, and so it was completely worth taking that week. And the parents understand that too...’I’m gonna go and learn how to be a better teacher, and learn different teaching strategies’ and they’re like, ‘oh, ok’ [455:463].

In contrast, though, Steven indicated “for me a schedule wouldn’t have mattered” [390].

**Theme 3: Participants describe their motivation to attend and engage in meaningful PD as intrinsic, but choosing Delta was greatly influenced by others.**

An overarching aspect of the third theme was the level of intrinsic motivation teachers expressed as Delta participants, although each acknowledged the influence of their peers and administrators. Each one of the participants shared a strong desire to improve in order to better serve their students. It seems teachers’ were intrinsically motivated to improve for their students and extrinsically motivated by others to choose Delta in order to actualize their goal.

From my perspective the best educators I know are people that have gone through Delta, and people that I strive to be like have gone through Delta. I mean to put it pretty simply,
the people I want to be like, at least what I’ve seen from them, the people I want to teach like have been through the program [Steven, 467:471].

Sally indicated her peers played a major role in her decision to attend. “If wasn’t for my colleagues, saying this is a phenomenal training...honestly I wouldn’t have gone. Just because of all the other things we have to do in the summer” [452:453]. However, she did express the influence her Carl Perkins coordinator had on her attendance.

I had heard a lot of things about Delta...I thought I really need to work on classroom things and so I could be a better teacher so then when he came and said ‘I have extra money, I want to send you to go’...I was like, ‘ok’ [19, 29:30].

Mary also expressed the influence her peers had on her attendance.

I had heard of Delta right when Bill and the groups who just started to go to the national trainings and come back and started to share some of those things at the [teachers association] conference...and I was really excited about it... I had been teaching for about 8 years, and I was really ready to rejuvenate my career [86:92].

Dave indicated his experience with small, Delta-like trainings influenced his decision to attend. “We have seen several little Delta mini-workshops at our fall and summer conference and they’ve built up to this” [152:153]. He also shared the role his principal played in motivating him to attend.

She really pushed me to do so and has supported me in the effort to do that. She’s probably the reason why I’m here, because she made me want to believe that I should be better. And not by telling me I should, she never said to me, ‘you really suck and you need to be better’, but she made me feel like I could be and this was an opportunity to do that [425:430].

Discussion

As this phenomenological study aimed to describe the lived experiences of participants at the Oregon Delta Conference, the overall essence of this phenomenon must first be described. While each of the themes and supporting text helped categorize the experiences of our participants, they seemed to experience Delta as something different; an exceptional PD experience that challenged them and helped them improve their practice. Moreover, though there were parts of Delta with which the participants struggled, they expressed a desire to pursue similar experiences in the future.

While we did not explicitly conduct our research with a framework in mind, our participants reported experiencing characteristics at Delta that aligned with the Desimone (2009) model, including their descriptions of collective participation, coherence, and active learning. Though Desimone (2009) refers to collective activities as those where teachers from the same school, department, or grade interact, we posit the commonality of agriculture educators, given their unique roles in the school setting, would meet the definition of collective participation. Our participants clearly stated the benefit working with their peers had on their overall conference
experience, particularly the opportunity to practice in front of them and receive feedback. Coherence tended to surface as well as teachers shared their Delta experience. Delta-like trainings tend to be pervasive in many settings throughout Oregon. Our participants reported the influences these opportunities had on their decision to attend Delta, lived experience at Delta, or their plans to continue their involvement after the conference.

Based on past PD experiences, which the participants in this study tended to speak about poorly, Delta seemed to cause some initial dissonance. Each participant seemed to have a negative impression of PD going into Delta, and seemed to need some external push to motivate them to attend. Each seemed intrinsically motivated to improve their teaching, but needed some convincing that a PD activity could make that a reality, particularly one like Delta that asks teachers to devote five full days of their summer. While there seems to be an opportunity to improve the marketing and education of exactly what the Delta experience is, the influence of past Delta participants on those who are considering the opportunity should not be underestimated.

**Recommendations**

While examining teachers’ experience at the Delta Conference may help us understand the Delta PD phenomenon, and teachers’ experiences may help improve the facilitation and logistics of the experience for future educators, we are still left with an important question: How does the experience actually impact each participant’s teaching, and consequently, their students’ achievement? Coonrod et al. (2009) helped us to begin answering this question, yet we have much to learn. To date, there have been several Delta Conferences across the nation, each slightly different from the others, but built on the same basic principles. How have these conferences impacted the participants’ teaching? We also propose the possibility of interviewing the alumni from the first National FFA Delta, held in 2006, to describe the impact the experience had on their careers eight years later. Anecdotally, we know of several who are now teacher educators in agricultural education, although research would provide the opportunity to formally add this to the literature on Delta.

Finally, based on what we learned from our participants, there are still PD experiences taking place that appear ineffective at worst, and show some room for improvement at best. The AAAE National Research Agenda (Doerfert, 2011) determined our profession should strive to provide “meaningful, engaged learning” (p. 9) for students. We must continue to investigate ways to ensure we are efficient with our PD dollars, efficient with our participants’ time, and effective with regard to improving practice in meaningful, engaged PD activities. Our study examined Delta, and while we are careful to avoid generalizing our findings, we must ask ourselves how these findings might inform other PD activities in our profession and beyond. Our findings lead us to question teachers’ general impressions of PD activities. Our participants seemed to seek activities to better their practice, but were cautious due to bad PD experiences they had in the past. We would recommend further research on teachers’ perceptions of PD and situate them between their schools and specific agricultural education PD activities. Furthermore, our study focused on the participants’ experiences at Delta, not on their behavior change. We recommend further studies to connect our findings to actual teacher behavior changes; perhaps mixed methods studies that combine research like Shoulders and Myers (2014) examination of teachers’
perceptions of science integration after participating in PD, with qualitative research designed to situate the quantitative findings from the participants’ perspectives.

References


An Examination of Pre-service Agricultural Science Teachers’ Interest and Participation in International Experiences: Motivations and Barriers

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Abstract

The importance of creating global mindedness within pre-service agricultural science teachers through international experiences cannot be over-stated. However, providing opportunities for international experiences and students selecting to participate in these opportunities are two very different aspects. Mechanisms must be put in place that can impact behavior and motivate participation. The theoretical framework for this study was based on the theory of planned behavior and motivation. Understanding why students do or do not participate in international experiences allows the development of programs to meet the targeted students’ needs. The purpose of this descriptive study was to investigate pre-service agricultural science teachers’ perspectives of and motivation for international experiences in order to facilitate the development of effective international experiences. The methodology employed mixed methods that included both an online survey and interviews. The total population consisted of 39 students of whom 32 completed the online survey and of these seven were interviewed. Findings reveal a preference for travel to a developed country as a group as well as the importance of hands-on activities and advance planning. The data provides suggestions for program planning and program preferences for agricultural science teachers.

Introduction

The Institute of International Education (2013) reported that while, overall, an increased number of students are studying abroad, the number of agricultural students who participate in study abroad is continuing to decrease each year. Recognizing the importance of understanding the global world in which we live and a call for an increase in international exposure for agricultural students is not new. Multiple studies (Connors, 2004; Harder, Lamm, Roberts, Navarro, & Ricketts, 2012; Hunter, 2004; Wingenbach et al., 2003; Zhai & Scheer, 2004) have reported the need for students to gain international experience. Wingenbach et al. (2003) conveyed a need for providing “out-of-country learning experiences” (p. 25) for students given study findings that revealed inadequate knowledge about international agricultural issues. Connors (2004) reported undergraduate students had not received exposure or instruction about international agriculture in high school. Connors called for an increase in exposure to international agriculture in both secondary and post-secondary educational programs. Further, Hunter (2004) pointed to the need for globally competent citizens which leads to the need to provide opportunities for international experiences at the post-secondary level.

Studies regarding international experiences in the context of agriculture have included topics focused on faculty development (Harder et al. 2012), college students’ reaction to a specific international experience (Farrell & Suvedi, 2003) or faculty who attended a specific international activity (Dooley, Dooley, & Carranza, 2008). An examination of agricultural students’ attitudes...
and perspectives towards cultural diversity revealed that those students who had more interaction with international people had an increased global perspective and “more positive attitude toward cultural diversity” (Zhai & Scheer, 2004, p. 48). A study conducted by Hains, Ricketts, and Tubbs (2012) revealed that student engagement in an international setting has the potential to elicit emotional response which can facilitate the learning process. Anderson, Lawton, Rexeisen, and Hubbard (2006) documented that a short term study abroad program can have a positive effect on cross-cultural sensitivity of participants. Farrell and Suvedi (2003) provided evidence of the positive impact that a study abroad experience can have on the lives of participants. Results from this case study analysis documented that students’ lives were in fact impacted through their participation in the study abroad program. Further, a study specifically focused on students preparing to be agricultural teachers revealed a gain in global competence due to an international experience outside the United States (Foster, Rice, Foster, & Barrick, 2014). In general, the results of these studies reveal a positive impact on perception and knowledge that can be obtained through direct experience in an international setting. However, steps must be taken to encourage students to enroll or participate in these types of experiences.

Providing opportunities for international experiences and students selecting to participate in these opportunities are two very different aspects. Bunch, Lamm, Israel, and Edwards (2013) documented motivators and barriers related to undergraduate student participation in international experiences and reported that many undergraduate students in the college of agriculture studied were not highly engaged in these experiences. These authors recommend additional research that includes qualitative interviews to further understand barriers that exist to participating in international experiences. Only limited studies have been published focused specifically on agriculture students preparing to be agricultural science teachers in the high school setting.

The importance of providing international experiences for undergraduate students studying to be agricultural science teachers is interrelated with the importance of the impact that agricultural science teachers have on youth. One study cited the importance of international experiences due to their expanded impact on an individual’s home and workplace, which can include family, colleagues and students (Place, Vergot, Dragon, & Hightower, 2008). Individuals carry with them the experiences they gain and these experiences can transfer to those with whom they interact. “Teacher education faculty represent a critical link in structuring educational experiences that assist their students to reach out to the international community” (Cushner, 2007, p. 37).

As early as 1994, research (Ibezim & McCracken, 1994) has pointed to the need for “integration of international agricultural concepts in the secondary schools” (p. 47). This early study also pointed to the fact that teachers with more cultural awareness would be more likely to incorporate international concepts. In more recent years, Elliot and Yanik (2004) reported that continued effort is needed to incorporate international elements into the high school agriscience curriculum in order to meet student needs. A study of high school students revealed that students had a positive attitude towards international issues but needed better instruction regarding international agriculture and expressed the need to continue to strive to incorporate international concepts into the high school curriculum (Radhakrishna, Leite, & Domer, 2003).
The incorporation of international concepts into the high school setting can be accomplished via opportunities provided to teachers. A case study reported by Sharp and Roberts (2013) revealed that it was possible for a pre-service agricultural education teacher to bring an international experience to the secondary classroom via the development of curriculum. The case revealed that high school students’ knowledge of the international location increased through this exposure. If professional development for teachers impacts student achievement as reported (Yoon, Duncan, Lee, Scarloss, & Shapley, 2007), what does that mean for activities that enhance the pre-service teacher? The need to provide and encourage international experiences for pre-service agricultural teachers is critical.

Global or world mindedness has been defined as a worldview where the “individual perceives his or herself as connected to the world community and is aware of his or her responsibility for its members” (Hett, 1993). World mindedness is “the extent to which individuals value global perspectives on various issues” (Douglas & Jones-Rikkers, 2001, p. 55). A person who is world-minded recognizes and appreciates cultural differences and can see viewpoints apart from their own vantage point (Boatler, 1992). Boatler also found that employees with increased world mindedness were better equipped for a changing corporate environment and in managing a diverse workforce. Similarly, Cox (1993) cited that world mindedness leads to increased levels of organizational effectiveness. Douglas and Jones-Rikkers found that study abroad was a good avenue to increase world mindedness (2001).

What can be done to assist future agricultural science teachers in gaining world mindedness? How can educational experiences be enhanced in such a way that prepares students to further share this perspective within their secondary curriculum? Participation in an international experience during their college career would be a first-step. However, the challenge is impacting their behavior and motivating them to participate in an international, experiential learning activity. This study addressed two priority areas of the National Research Agenda: Priority 3 – “Sufficient Scientific and Professional Workforce That Addresses the Challenges of the 21st Century” (p. 9) and Priority 5 – “Efficient and Effective Agricultural Education Programs” (Doerfert, 2011, p. 10). Student participation in international experiences has the potential to both improve the workforce and improve agricultural education programs.

**Theoretical Framework**

The theoretical framework for this study was based on the theory of planned behavior and motivation. Understanding why students do or do not participate in international experiences allows the development of programs to meet the targeted students’ needs. The theory of planned behavior (Ajzen, 2006) explains that individuals act on behavioral decisions based upon “behavioral beliefs,” “normative beliefs,” and “control belief.” Each of these beliefs translates into an “intention” to act on a “behavior.” Given that attitudes impact beliefs, it is critical to understand the attitude and perception of our audience if we are to impact their intention to participate in international experiences.

Motivation is a key aspect to all educational endeavors. Learners must be motivated to engage, participate in, and internalize experiences from educational activities. These motivations can be both internal and external. Understanding motivation can enable elements to be put in place that would not only encourage participation but enable greater gain from participation. Keller (1987)
provides a framework for motivation related to instructional design that includes four areas: attention, relevance, confidence, and satisfaction. The Keller model “is grounded in expectancy-value theory which derives from the work of Tolman (1932) and Lewin (1938)” (Keller, 1987, p. 2). Given that the development of international experiences are in fact intended to be educational endeavors, the Keller model was used as a means of understanding how international experiences could be designed to best motivate participation and engagement.

The planning, development, and implementation of international experiences directly impact the ultimate participation of agricultural science pre-service teachers in these programs. Only through an understanding of attitude and perspective can we meet the needs of students as we consider behavior and motivation. Encouraging participation in these programs is not sufficient; activities that occur before, during and after the programs are all critical in the process in order to encourage a change in behavior, meet motivation needs, and enable learning.

**Purpose and Objectives**

The purpose of this descriptive study was to investigate pre-service agricultural science teachers’ perspectives of and motivation for international experiences in order to provide guidance for the development of effective international experiences that meet student needs while increasing global mindedness of participants. Specific objectives included a) document past participation in international experiences, b) identify preferences for program characteristics (i.e., beliefs), c) document motivation for participation in international experiences, and d) identify aspects that would encourage or discourage participation (i.e., motivation).

**Methodology**

The methodology employed mixed methods and followed a “sequential explanatory design” (Creswell, Plano Clark, Gutmann, & Hanson, 2003, p. 178). This design was selected in order to “use qualitative results to assist in explaining and interpreting the findings of a primarily quantitative study” (p.178). An online survey was utilized to collect quantitative data and individual interviews were employed to collect qualitative data to enable a rich understanding of the quantitative data.

The researcher developed survey was based upon the work of Briers, Shinn, and Nguyen (2010) and modified to include questions to capture beliefs, motivation, and personal experience. The survey included questions related to participation in international experiences, preference for various characteristics of these experiences, motivation for participation, importance placed on various characteristics, foreign language ability, and experience outside of the state and country. Basic demographic questions were also included in order to describe the respondents. A combination of multiple-choice, ranking, short answer response, and Likert-type questions were utilized. The interview protocol consisted of open-ended questions designed to encourage respondents to share opinions regarding international experiences in general and aspects that would encourage or discourage participation. Interview questions also encouraged students to share their perspective related to the importance of international experiences and their own personal future plans. Both the survey and interview protocol were reviewed by a panel of experts for face and content validity. Adjustments were made based upon recommendations prior to data collection. Institutional review board approval was received to conduct the study.
Questions were treated as independent statements and frequencies and percentages were reported.

Completion of the online survey required, on average, eight minutes to complete. Data collected via the online survey was analyzed using a statistical software program (i.e., SPSS). Interviews were conducted in person and respondents were coded R01 through R07 in order to maintain confidentiality. Each interview lasted approximately 30 minutes. After four interviews were conducted, a peer debriefing was held to identify themes and determine if additional interviews were necessary. Based upon data analysis, an additional three interviews were conducted. Following an additional peer debriefing, it was determined that data saturation had been reached. Triangulation was accomplished through the comparison of respondents’ responses within the context of the interview and their responses to the online survey. An audit trail was implemented through the use of coding to ensure that statements could be connected with themes and sources (Erlandson, Harris, Skipper, & Allen, 1993) as respondent’s statements were coded and grouped into themes. The constant-comparative method (Glaser & Strauss, 1999) allowed themes to emerge and provided a descriptive picture to support and further explain the survey findings. A journal and documentation of the audit trail increased trustworthiness and credibility.

The population consisted of Spring and Fall 2014 student teachers enrolled at Texas A&M University who were in the process of completing an agricultural teacher certification program. The total population consisted of 39 students of whom 32 completed the online survey and of these seven were interviewed.

Findings

Description of the Population
The population consisted of students enrolled in the agricultural science education program at Texas A&M University who were pursuing teacher certification (see Table 1). Of the responding students, 53% hold cumulative GPAs of 3.00 or higher, 75% were female and 25% were male, all of whom were 20 years or older. Approximately 90% either had already graduated with an undergraduate degree or plan to graduate in 2014. The majority of the students have lived only in Texas, and only 6% have lived outside of the United States for more than a year. The ethnic origins of the respondents were 94% Caucasian and 6% Hispanic or Latino. Furthermore, only 3 students (9%) indicated being conversational in a language other than English; two in Spanish and one in Japanese.

Over 70% of the respondents reported having a full or partial scholarship; 12% and 59%, respectively. Furthermore, 75% of respondents have a loan through a governmental or non-governmental source, and 34% of students pay for their tuition and fees themselves. Additionally, 72% of students receive some kind of financial assistance from family, while 12% use money saved from their previous work and 15% currently work to assist in financing their education.
Table 1
**Summary of Demographic and Scholastic Characteristics of Respondents**

<table>
<thead>
<tr>
<th>Demographic/Scholastic Characteristic</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>75</td>
</tr>
<tr>
<td>Ethnic Origin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White only</td>
<td>30</td>
<td>94</td>
</tr>
<tr>
<td>Hispanic or Latino of any race</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Language(s) spoken other Than English</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spanish</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Japanese</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>29</td>
<td>91</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 years</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>21 years</td>
<td>14</td>
<td>44</td>
</tr>
<tr>
<td>22 years</td>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td>23 years or older</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Cumulative Grade Point Average</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3.50-3.99</td>
<td>9</td>
<td>28</td>
</tr>
<tr>
<td>3.00-3.49</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>2.50-2.99</td>
<td>13</td>
<td>41</td>
</tr>
<tr>
<td>2.00-2.49</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Residence(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lived only in Texas</td>
<td>23</td>
<td>72</td>
</tr>
<tr>
<td>Lived outside of Texas for 1-9 years</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Lived outside of Texas for more than 10 years</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Lived only in U.S.</td>
<td>30</td>
<td>94</td>
</tr>
<tr>
<td>Lived outside of U.S. for 1-9 years</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Lived outside of U.S. for more than 10 years</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

**Note.** N = 32.

**Participation in International Experiences**

Of the responding students, 44% reported no international experience. Of the fourteen students with no international experience, 21% reported they were interested in pursuing an opportunity, 57% said they were not able, and 21% had no interest in gaining an international experience in college (see Table 2). For the 56% of students with previous international experience, 56% were interested in pursuing an opportunity, 22% said they were not able, and 22% and no interest in pursuing an international experience in college.

Respondents interviewed included two males and five females with a variety of experiences. Four respondents interviewed had international experience but only one of these had gained the experience as a part of college. The other three individuals had gained their experiences in secondary school (R04), lived overseas (R01) or participated in a cruise (R05). Three of the
respondents interviewed reported no international experience. The majority (five of the seven) of the respondents interviewed had friends or family members who had travelled internationally.

Table 2
Respondents’ Participation and Willingness to Participate in International Experiences Outside of the United States

<table>
<thead>
<tr>
<th>International Experience or Willingness</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you participated in any international experiences that involved travel outside of the United States (for school or personal)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, and it was very satisfying</td>
<td>15</td>
<td>47</td>
</tr>
<tr>
<td>Yes, and it was OK</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Yes, but it was not satisfying</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No, I have not participated in any international programs</td>
<td>14</td>
<td>44</td>
</tr>
<tr>
<td>Would you consider participating in an international experience in college?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, I am interested</td>
<td>13</td>
<td>41</td>
</tr>
<tr>
<td>No, I am not interested</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td>No, I am not able</td>
<td>12</td>
<td>38</td>
</tr>
</tbody>
</table>

Note. N = 32.

Preferences Related to Program Characteristics

Of the top 10 countries self-identified by respondents, seven of them are located in Europe (making up almost three-fourths of respondent preference within the top 10 countries), two were part of the continent of Australia, and one in South America (see Table 3). All of these countries are classified by the United Nations (2012) as having developed economies. This finding was further supported by qualitative data which revealed that students had a definite preference for developed countries. As one respondent stated, “I would hesitate to go to an undeveloped country” (R03). However, almost all respondents interviewed indicated that distance did not impact their participation – in fact the one respondent that said yes stated, “Going further might be more exciting” (R06).
Most respondents indicated they would prefer an international experience either via a Texas A&M University (TAMU) study abroad program or through an internship. Moreover, most respondents ranked an international experience via enrollment in a foreign university or a non-Texas A&M University study abroad program the lowest. Over 80% also ranked an international experience through a service-learning or volunteer program (e.g., church) as two, three, or four out of six. Comments received during interviews further supported and clarified these preferences. Students (R01, R02) reported that an internship would have greater value to them than merely a trip to a foreign country or participation in a study abroad.

Table 3

<table>
<thead>
<tr>
<th>Country</th>
<th>1st Choice (N = 30)</th>
<th>2nd Choice (N = 29)</th>
<th>3rd Choice (N = 27)</th>
<th>4th Choice (N = 26)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Australia</td>
<td>6</td>
<td>20</td>
<td>1</td>
<td>3.4</td>
</tr>
<tr>
<td>England</td>
<td>4</td>
<td>13.3</td>
<td>5</td>
<td>17.2</td>
</tr>
<tr>
<td>Italy</td>
<td>3</td>
<td>10</td>
<td>4</td>
<td>13.8</td>
</tr>
<tr>
<td>Scotland</td>
<td>3</td>
<td>10</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Germany</td>
<td>2</td>
<td>6.7</td>
<td>5</td>
<td>17.2</td>
</tr>
<tr>
<td>France</td>
<td>2</td>
<td>6.7</td>
<td>1</td>
<td>3.4</td>
</tr>
<tr>
<td>Brazil</td>
<td>2</td>
<td>6.7</td>
<td>3</td>
<td>10.3</td>
</tr>
<tr>
<td>New Zealand</td>
<td>2</td>
<td>6.7</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Spain</td>
<td>1</td>
<td>3.3</td>
<td>2</td>
<td>6.9</td>
</tr>
<tr>
<td>Ireland</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Note. Top 10 were selected based on total number of participants’ placing in the top 4.

Nearly all students revealed that they would prefer an international program that lasted 1-6 weeks; 41.4% preferring 1-2 weeks and 43.3% preferring 3-6 weeks. While most students ranked the 1-6 week range as their first and second preference, 7-14 weeks was mostly the third/fourth.

Sixty-eight percent of respondents ranked 15 or more weeks as their lowest preference for an international experience. These findings were confirmed during the interviews. All the respondents interviewed indicated that length of stay would impact their decision to participate. The suggestions varied from two weeks to two months. There was both an indication of making sure the program was long enough to experience the culture but not so long that it interfered with other obligations.

Motivation for Participation in an International Experience

Most respondents selected increased employability, the opportunity to live in another country, the enhancement of life experiences, and a boost to their résumé as attributes that definitely would motivate them to take part in an international experience (see Table 4). Other factors that the majority of respondents determined to be motivational (either probably or definitely) included the learning of a new language, the importance of international experiences pertaining to their personal development, the enhanced knowledge of their academic specialization, and obtaining a graduate degree. The factor that participants deemed as the least motivational, though
there was a broad array of results, was the opportunity to work in another country after completing their current degree.

All respondents interviewed indicated that participating in an international experience would be beneficial. They expressed awareness that they would gain a new perspective (R03, R06, R05), learn about a new culture (R02, R04, R05, R07), and meet new people (R01). As one respondent stated, “It would heighten my ability to extend what I know” (R02).

Table 4
Ratings of Motivational Factors for International Experience(s) Among Respondents

<table>
<thead>
<tr>
<th>Factor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhance my life experience</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>10</td>
<td>16</td>
<td>4.31</td>
<td>0.78</td>
</tr>
<tr>
<td>Increased employability</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>11</td>
<td>15</td>
<td>4.19</td>
<td>0.97</td>
</tr>
<tr>
<td>Looks good on a résumé</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>17</td>
<td>4.00</td>
<td>1.32</td>
</tr>
<tr>
<td>Opportunity to live in another country or culture</td>
<td>2</td>
<td>1</td>
<td>6</td>
<td>9</td>
<td>14</td>
<td>4.00</td>
<td>1.16</td>
</tr>
<tr>
<td>Important stage in my personal development</td>
<td>1</td>
<td>2</td>
<td>9</td>
<td>11</td>
<td>9</td>
<td>3.78</td>
<td>1.04</td>
</tr>
<tr>
<td>Enhance knowledge of my academic specialization</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>12</td>
<td>9</td>
<td>3.72</td>
<td>1.14</td>
</tr>
<tr>
<td>Get a graduate degree</td>
<td>1</td>
<td>8</td>
<td>6</td>
<td>11</td>
<td>6</td>
<td>3.41</td>
<td>1.16</td>
</tr>
<tr>
<td>Learn another language</td>
<td>4</td>
<td>4</td>
<td>7</td>
<td>10</td>
<td>7</td>
<td>3.38</td>
<td>1.31</td>
</tr>
<tr>
<td>Importance placed by academic advisor or department</td>
<td>2</td>
<td>8</td>
<td>7</td>
<td>11</td>
<td>4</td>
<td>3.22</td>
<td>1.16</td>
</tr>
<tr>
<td>Opportunity to work in another country after completing current degree</td>
<td>8</td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>5</td>
<td>2.91</td>
<td>1.44</td>
</tr>
</tbody>
</table>

Note. Factors organized by highest mean. DWN = definitely will not motivate. PWN = probably will not motivate. N = neutral. PW = probably will motivate. DW = definitely will motivate.

Aspects that Encourage or Discourage Participation in an International Experience
No listed factor on the survey was, by a large number, considered to be very unimportant or not important at all in regard to participation in an international experience; however, a small number (22%) noted weather conditions/climate as not important, and a majority selected having friends with them as neither important or unimportant (see Table 5). Aside from having friends with them on a study abroad, every other factor was considered important by majority. Cost and subject matter of the program were revealed as extremely important factors both within the quantitative data and the qualitative data. With the exception of the country, subject matter, costs, cultural attractions, and weather/climate, at least 10 respondents chose neither important
nor unimportant for all factors (7 out of 10). Qualitative findings support those displayed in Table 5. Interviewees indicated that the financial aspect directly impacts their participation. Safety was recognized as important, but as shared by one student “I trust the university” (R07). Only one interviewee indicated program type as non-influential; each of the others said this would impact their participation. Respondents indicated an interest in an experience as a group (R05, R07) with the focus on experience rather than academics (R05).

Table 5
**Important Factors for Respondents When Selecting an International Experience While in College**

<table>
<thead>
<tr>
<th>Factor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>0</td>
<td>2</td>
<td>6</td>
<td>9</td>
<td>15</td>
<td>4.16</td>
<td>0.95</td>
</tr>
<tr>
<td>The subject matter of the program</td>
<td>0</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>14</td>
<td>4.06</td>
<td>1.01</td>
</tr>
<tr>
<td>The country itself</td>
<td>0</td>
<td>3</td>
<td>7</td>
<td>11</td>
<td>11</td>
<td>3.94</td>
<td>0.98</td>
</tr>
<tr>
<td>Accessibility to and from the U.S.</td>
<td>0</td>
<td>2</td>
<td>10</td>
<td>11</td>
<td>9</td>
<td>3.84</td>
<td>0.92</td>
</tr>
<tr>
<td>The reputation of the foreign university</td>
<td>0</td>
<td>3</td>
<td>10</td>
<td>9</td>
<td>10</td>
<td>3.81</td>
<td>1.00</td>
</tr>
<tr>
<td>The reputation of non-TAMU university organizing the program</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>12</td>
<td>8</td>
<td>3.78</td>
<td>0.97</td>
</tr>
<tr>
<td>Cultural attractions in the area</td>
<td>1</td>
<td>4</td>
<td>6</td>
<td>13</td>
<td>8</td>
<td>3.72</td>
<td>1.08</td>
</tr>
<tr>
<td>The language spoken in the country</td>
<td>1</td>
<td>3</td>
<td>10</td>
<td>10</td>
<td>8</td>
<td>3.66</td>
<td>1.07</td>
</tr>
<tr>
<td>For TAMU programs, the reputation of the specific program</td>
<td>0</td>
<td>3</td>
<td>11</td>
<td>13</td>
<td>5</td>
<td>3.63</td>
<td>0.87</td>
</tr>
<tr>
<td>Weather conditions/climate</td>
<td>1</td>
<td>6</td>
<td>9</td>
<td>10</td>
<td>6</td>
<td>3.44</td>
<td>1.11</td>
</tr>
<tr>
<td>Having friends on the study abroad with me</td>
<td>2</td>
<td>4</td>
<td>14</td>
<td>4</td>
<td>8</td>
<td>3.38</td>
<td>1.18</td>
</tr>
</tbody>
</table>

*Note. Factors organized by highest mean. NI = not at all important. VU = very unimportant. N = neither important nor unimportant. VI = very important. EI = extremely important.*

Respondents interviewed varied in regard to the importance of connecting an international experience with course credit. Some (R03, R07) felt strongly that the experience should be connected with course credit, while others (R04, R05) felt strongly that the experience should not be connected with course credit. Students revealed in the survey a mixed opinion regarding the role that language spoken in the country would play in their decision to participate; this was also exhibited during the interviews. Five respondents interviewed (R01, R02, R03, R05, R07)
indicated that the language of the country could impact their decision to participate. However, of these one stated, “We could use cheat sheets of phrases” (R02) and another stated, “We could use translators” (R03). These statements reveal that the language spoken may not have same level of impact on their decision as one might think. Given that the majority (91%) of the students reported no second language, this concern is understandable. Surprisingly, the quality of accommodation during an international experience was shared as an important aspect to the respondents interviewed (R01, R02, R05, R06, R07). Respondents interviewed were split on the role that climate would play in their decision to participate with some (R01, R02) indicating that the nature of agriculture itself could impact the success of the trip based on climate. All interviewees indicated that program reputation would impact their participation decision.

In response to the question related to what one might lose through participation in an international experience, only one respondent reported nothing (R06). The remaining respondents interviewed expressed very specific items. Time with family being lost was expressed by multiple respondents interviewed (R01, R02, R04, R05). Additional factors related to domestic job opportunities and experiences lost (R05, R06, R07) and impact on academic progress (R01, R07). All respondents interviewed indicated an awareness of international experiences available at the university and within the department. Further, respondents interviewed revealed an understanding of the positive impact that participation in an international experience could have on their job opportunities. Expressing that an international experience would differentiate them from other students (R01, R06), make you appear more flexible (R03, R04) and in general increase your opportunities (R04, R05).

During the interviews, respondents were asked for their specific recommendations as to how the department could design a program that would meet their needs. Aspects including cost, timing, promotion, group travel, hands-on activities, academic scheduling considerations, and program focus were each mentioned by multiple individuals. A strong interest in an agricultural science focused experience was expressed (R04, R05, R07) which would contain hands-on activities (R02, R04, R07), and be conducted with pre-service teachers as a group (R06, R07). It was recommended that the experience be introduced at least a year in advance to allow planning (R05) in relation to both saving funds (R01) and adjusting their schedules (R04). They emphasized the impact that cost had on their participation and recommended strategies to be put in place that would allow them to set-aside funds in advance of their participation in an international experience as well as strategies that would enable group fund raising to defer costs for all students in the agricultural science area.

**Conclusions**

A review of both qualitative and quantitative data revealed that overall the students are aware and open to an international experience, but that there are specific aspects that would encourage or discourage their participation. It was concluded that while cost is a critical factor in the decision process, it is not the only factor. Program focus and general safety concerns, as perceived by the student, are also very important. Given that a majority of the countries recommended by students both via the survey and in the interviews are classified by the United Nations (2012) as having developed economies, it was concluded that students have a preference for experiences with the comforts of the western or developed world. However, interviews
revealed openness for experiences in undeveloped countries as long as those experiences were safe, educational, and affordable.

Students reported enhancing their knowledge of their academic specialization as a positive motivational factor and stressed the importance of hands-on activities as part of an experience; thus, it was concluded that in order to motivate pre-service agricultural science teachers to participate in international experiences these experiences would need to be experiential. This confirms the literature that “teacher education study abroad programs can be transformative for pre-service teachers, leading them on a path toward worldview…” (Marx & Moss, 2011). Given responses to motivational factors, the data suggests that most students found the most motivation in a benefit for their own “premier leadership, personal growth, and career success,” which are key components in the mission of the National FFA Organization (2013, p. 6) and agricultural education, which is their focus of study. While the quantitative data suggest that having a friend with them during an international experience was not a key factor in selecting an international experience, the qualitative data from the interview suggests otherwise. Several students made it known that having someone they knew with them during the experience was preferred. It was concluded that an international experience designed for agricultural science students as a group would be well received by these students.

Implications and Recommendations

Effective planning for an international experience requires an understanding of the target group for which the experience is being designed. It is not surprising that agricultural science teachers would prefer hands-on, applicable and immediately relevant experiences. The agricultural science classroom is by nature experiential and the importance of “learning by doing” (Dewey, 1938) is critical to these students; experiential learning must be an integral part of international experiences for this audience and the learning must be relevant (Keller, 1987).

Theory of planned behavior (Ajzen, 2006) explains that students’ behaviors will be based upon their beliefs and thus we must understand their beliefs. While we might “think” that an experience in an undeveloped country would be a “good” experience for them – if the students “believe” that they do not want to travel to an undeveloped country – it is quite possible that they will not sign up to participate in those programs. Thus, efforts should be made to design programs that match their beliefs in order to encourage global mindedness. It is possible that a trip to a developed country could lead to a trip to an undeveloped country in the future.

Motivation is critical in encouraging participation. Keller (1987) shared the important role that satisfaction can play in motivation. Respondents (via the online survey and interviews) revealed the importance of receiving credit for participation in international experiences, the importance of having friends and people they knew with them, and the concept of financial planning; each of these aspects impact student satisfaction. Based on conclusions, the implication exists for an international experience to be designed and planned a year in advance specifically for pre-service agricultural science teachers that involve the entire group of teachers as a cohort. This approach could motivate students to actually sign-up for an international experience.

As noted earlier, providing opportunities for international experiences and students selecting to participate in these opportunities are two very different aspects. The findings from this study
reveal specific characteristics related to programming planning that have the potential to impact agricultural science teacher participation in an international experience. Aspects including a cohort approach, hands-on activities, and advance planning were revealed. Findings provide suggestions for program planning and program preferences for students studying to be agricultural science teachers.

References


Exploring Recruitment Messages to Target Hispanic Students into Agricultural Degrees at Texas Tech University

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Abstract

There is a lower number of Hispanic students pursuing a degree in agriculture-related fields as compared to the distribution of the general population of students. These students often have negative perception and lack information about the agricultural industry and are usually uninterested in careers in agriculture. A qualitative case study was conducted to determine the motivations and influences impacting Hispanic and non-Hispanic students in choosing a major, college, and career, and determine if there was a difference between Hispanic and Non-Hispanic students. Data were collected through focus groups and participant observation. Sixty-seven high school students enrolled in agriculture classes in two communities surrounding Texas Tech University participated. It was determined that money, size/distance, and activities were influential factors for both Hispanic and non-Hispanic students picking a major, college, and career. When being recruited into the College of Agricultural Sciences and Natural Resources, Hispanic and Non-Hispanic students wanted to hear messages regarding earning potential, opportunities, and extra-curricular activities.

Introduction

Hispanics are the fastest growing ethnic minority group in the United States (Gandara, 2010) having grown seven times faster than the population of the nation. According to the United States Census, in 2010, there were 50.5 million Hispanics in the U.S.–one in six people in the country. In 2011, Hispanics made up 38.1% of [State], compared to 16.7% in the U.S. (U.S. Census, 2011). The Hispanic public school population nearly doubled between 1987 and 2007 from 11% to 21% of all U.S. students (National Center for Education Statistics, 2013).

Hispanics are a major share of the U.S. labor force (Gandara, 2010), thus they will increasingly be critical to the productivity of the economy (Rodriguez, Sáenz, Menjivar, Rodríguez, & Massey, 2008). According to the U.S. Census Bureau projections, Hispanics will account for almost one-half (45%) of the population growth between 2010 through 2020. A substantial fraction among Hispanics is pursuing the American dream and is advancing beyond the humble status (low-paying laborious jobs) of the parental generation (Alba, 2006).

However, Hispanics continue to be the least educated of all major ethnic groups (Gandara, 2010). In a survey by the Pew Hispanic Trends Project (2004), nearly nine-in-ten Hispanics said that a college education is important for success in life, yet only about one-half (48%) say they actually plan to get a degree.
Agriculture is the largest employer in the U.S., with opportunities in every phase from growing food and fiber to selling agricultural products at the retail level (Jones & Larke, 2003). It is estimated that the agricultural sector will generate 54,000 jobs annually. Of these jobs, 74% will be in business and science occupations. Fifteen percent of openings are expected to be in agriculture and forestry production, and 11% are expected in education, communications, and government services. From 2010-2015, five percent more college graduates with expertise in agriculture and food systems, renewable energy, and the environment will be needed when compared to 2005-2010 (Goecker, Smith, Smith, & Goetz, 2010). A shortfall of new graduates with preparation in priority business and science specialties is forecasted in the latter half of the period. Annually, an average of 29,300 graduates are expected from colleges of agriculture and life sciences, forestry, natural resources, and veterinary medicine, indicating a large shortage of qualified employees (Goecker et al., 2010).

At Texas Tech University total enrollment for Fall 2013 was 33,111 students. The College of Agricultural Sciences and Natural Resources’ (CASNR) total enrollment was 1,928 students. In the same year, nearly 19% of the University’s student enrollment was Hispanic, whereas CASNR’s undergraduate student enrollment was 10.5% Hispanic (CASNR Dean’s Office, 2013). Although the Hispanic population of CASNR is low, it has gradually increased over the last five years. CASNR at Texas Tech University places a high priority in creating a welcoming, inclusive, and friendly environment for all its students (personal communication, [CASNR associate dean], October 18, 2013) as this type of environment has been found to aid in recruitment and retention (Wildman & Torres, 2001). Students have noticed these efforts; with many saying the college feels like a family and provides a sense of belonging (Adams, 2012; Wimmer & Meyers, 2013).

Many have noted the importance for institutions of higher education to make recruiting and retaining Hispanic students a priority so the U.S. is able to remain competitive in the global economy (Jones & Larke, 2003). One of the biggest challenges facing agriculture and natural resource professionals and educators lies in recruiting and retaining traditionally underserved populations (Outley, 2008). Demographic trends indicate minority students must be recruited into agricultural careers in order to sustain the agricultural industry for the future and to help ensure the U.S. remains competitive in the global economy (Jones & Larke, 2003). To sustain leadership for a viable agricultural industry, the face of agriculture should mirror diversity from the national level to the local communities and schools (Roberts, Hall, Gill, Shinn, & Juarez, 2009). Yet there have been very few changes in the way minorities are recruited into higher education and agricultural careers (Outley, 2008).

It is vital that institutions of higher education make recruiting and retaining Hispanic students a priority (Miller & Garcia, 2004). Institutions are encouraged to develop and provide appropriate services and resources for Hispanic students because the development and success of all students should be a primary concern for institutions of higher education (Jones, Castellanos, & Cole, 2002).

However, a national study in 2005 found that 41% of Hispanic students surveyed had a misconception or negative image about agricultural science (Romero, 2010). Thirty-three percent of the same students surveyed lacked knowledge about employment opportunities and 22% lacked knowledge about the various fields of study within agriculture sciences and natural
resources (Scott & Lavergne, 2004; Romero, 2010). Hispanic students tend to have negative perceptions of agriculture because they associate agriculture with extensive hard labor, such as fieldwork, which is a common job for immigrants (Roberts, et al., 2009). Images of agriculture tend to project a profession that focuses excessively on vocational skills building, FFA, and a profession mostly for white males. Consequently, many minority students and families equate food and agricultural science careers with farming or ranching, rather than the science or business aspects of the agricultural sciences, and many see it as a profession for White males (Orethael, Sorenson, Lerman & Riesenberg, 1989; Wiley, Bowen & Heinsohn, 1997).

**Recruiting Hispanic High School Students**

Television and social media is the key for reaching Hispanic Millennials and teens (Fiel, 2012). This age group is the primary user of smartphones and tablets and they dominate Facebook and Twitter. Hispanics, more likely than other ethnic groups, have been avid technology users and embrace mobile and social media tools. They are a digitally connected generation (Fiel, 2012). According to Fiel (2012), Spanish-language campaigns are not the way to reach this demographic, as they may feel removed from their countries of origin and many no longer speak Spanish.

Although Hispanic Millennials are the head of the Hispanic baby boom, Hispanic tweens and kids will likely be even more acculturated. Plasencia (2012) noted that no matter the demographic, you must connect by embracing their culture, from the food they eat to the music they listen to, and the media they consume. Because of this CASNR at Texas Tech University plans to create videos to be used in high school recruitment visits, the college website, and related social media channels.

**Theoretical Framework**

This study was based on Chapman’s (1981) Model of Student College Choice in that many colleges and universities believe they can improve recruiting effectiveness and affect students’ college choice by modifying the schools description or strategically targeting recruits. Chapman’s model (1981) suggested that students’ college choice is influenced by a set of student internal characteristics: socioeconomic status, aptitude, level of educational aspirations, and high school performance. Internal characteristics are combined with external influences: significant people, fixed characteristics of the institution, and the institution’s own efforts to communicate with prospective students. Figure 2.1 shows a visual representation of the college choice model.

**Internal Characteristics**

Chapman (1981) stated that students from families of an average or below average socioeconomic status might begin college at a community college, while students from homes with a higher SES are more likely to attend a four-year college/university. Student’s realistic options can be limited by tuition and financial aid. SES can also influence other factors, such as educational aspirations and expectations. According to Chapman (1981), aptitude influences high school achievement and performance on the aptitude tests associated with college entrance examinations, which universities usually use as a screening process for selecting students. High school performance may also trigger a set of other responses that can help shape college choices (Chapman, 1981).

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External Influences
Chapman (1981) stated that when selecting a college, students are strongly persuaded by significant people, such as their parents or friends with parents being the greatest influence. According to Chapman (1981), a significant person in a student’s college decision-making process could also include friends, relatives, teachers, and/or counselors. A significant person may influence a student’s college choice by helping shape a student’s expectations, providing direct advice about the college. Nine out of 10 Hispanic parents expect their children to attend college (Roll & Irwin, 2008). In a study examining recruitment of first generation college students at Texas Tech University, Adams (2012) interviewed several Hispanic participants who felt their parents impacted their decisions to pursue a college education. Adams (2012) also found many students credited agri-science teachers as supporters of higher education. Jones and Larke (2003) concluded that minority students have been greatly impacted by the influence of significant others and having people of color, regardless of their profession, to encourage the students to consider careers in agriculture-related fields. Outley (2008) suggested the lack of minority professionals in agriculture who can serve as role models could be a significant barrier to encouraging minority youth to pursue agricultural careers.

Location, cost, campus environment, and the availability of desired programs are included in the model, as fixed college characteristics and are up to the institutions to modify over time (Chapman, 1981). Chapman stated that there is conflicting research about the influences of cost; however, cost must be considered in the larger model of college choice. Chapman (1981) also
suggested that prospective students in an area with many colleges are less likely to travel as far to college as prospective students in rural areas.

**Purpose and Objectives**

In order to investigate the low percentage of Hispanics students seeking agriculture-related degrees, their motives of educational and career choices were examined. The purpose of this study was to test recruitment messages targeting potential Hispanic students into CASNR at Texas Tech University. This study also sought to determine why these students ultimately choose, or do not choose, to pursue a college degree in agriculture and related pathways. This was accomplished through the following research questions:

1. What influences non-Hispanic students to select a major, college, and career?
2. What influences Hispanic students to choose a major, college, and career? Are Hispanic students different from the overall population of students?
3. What messages do high school students want to see in recruitment videos for CASNR and agricultural careers?

This study aligns with priority three of the National Research Agenda: Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century. In order to improve “agricultural productivity efficiency and effectiveness in meeting our global food, fiber, and energy needs, a sufficient supply of well-prepared agricultural scientists and professionals is needed to drive sustainable growth, scientific discovery, and innovation in public, private, and academic settings” (Doerfert, 2011, p. 9).

**Methodology**

To accomplish the purpose of this study, the researcher used a qualitative case study method. A case study explores a phenomenon through a variety of different scopes, allowing for multiple facets of the phenomenon to be revealed and understood (Baxter & Jack, 2008). The selection of methods is informed by the researcher and case intuition and makes use of naturally occurring sources of knowledge, such as people or observations of interactions that occur in the physical space (Stake, 1998). In this instance, the case selected for study was high school students enrolled in agriculture classes at schools with a high Hispanic population in the Texas Tech University area.

Focus groups were conducted to collect opinions, examine attitudes, and observe participants. A one-page intake form was distributed to each participating student to obtain demographic information including age, ethnicity (generational status if Hispanic, i.e. participant born outside the U.S., parents born outside the U.S.), parents’ place of employment, post-high school plans, and interest in agricultural careers. Participant observation was also conducted to examine body language, group dynamics, and other factors that may not have been spoken by the participants during the focus groups. A focus group was the most appropriate method of data collection for this study because the researcher wanted to observe a demographic in a group setting and learn about their attitudes and feelings toward agricultural careers.
Prior to data collection, two recruitment videos were created based on recommendations from current television advertising and Hispanic-specific advertising literature. According to Lantos and Craton (2012), television advertising messages and interacting elements should include factors such as music, setting, characters, voiceover, and storyline. Messages targeted at Hispanic teenagers need to be in English (Fiel, 2012). Based on this information, the lead researcher, a Hispanic graduate student proficient in video production, created two recruitment videos to be played during the focus groups. The research team felt it would be best to have the lead researcher create the videos as she was closer in age to the students and could relate better to them.

The first video was a typical recruitment video showing clips of the university and giving facts and information in a voice over. The second video was an animated recruitment video for the agriculture industry. The video used pictures, typography art, bright colors, and statistics about agriculture that exposed the different education and career pathways in the industry. The video made references to pop culture and was set to the beat of a top 40 pop song that was familiar to American teenagers.

The researcher received permission from the university’s Institutional Review Board (IRB). The IRB application included parent information and consent letters, in both English and Spanish. Student assent forms were also provided.

According to Krueger (2002), a population sample should include participants who are similar types of people. The population was selected by the research committee and included high school students enrolled in agriculture programs in communities surrounding the university. Because the researcher was interested in understanding Hispanic students’ attitudes and influences, schools with a high percentage of Hispanic students were targeted. The researcher contacted six high schools in the surrounding rural area to participate in the focus groups. The lead researcher first contacted the schools’ agri-science teachers, and two schools agreed to participate with permission from their administrators.

The researcher scheduled the focus groups on dates that worked best for the teacher’s schedule. The teachers distributed the parental consent and student assent forms to their students prior to the focus group session. Participating high school agriculture teachers coincidently mostly taught welding classes, thus participants in the study were students who were enrolled mostly in welding classes at the target schools.

Due to scheduling conflicts, participating teachers did not provide an alternative for separating non-Hispanic students from Hispanic students. In some instances, non-Hispanic students heavily outweighed their Hispanic peers, and in those cases, Hispanic students were not singled out from their non-Hispanic counterparts, to keep them from feeling uncomfortable, nor were they informed that their ethnic characteristics were being observed.

Of the 67 participants, 37 were Hispanic. Six of the Hispanic participants were first-generation Americans (born outside the U.S.), 12 were second generation (parents were born outside the U.S.), and 19 were third generation or later. Although there were 67 participants, only 16 actively engaged with the researcher and gave more detailed answers. Of the 16 active participants, seven were Hispanic, nine were Non-Hispanic.
The researcher visited eight classes total: six at one school, two at the other. The semi-structured focus groups were limited to the length of one class period. The focus groups were video recorded by a member of the thesis committee to ensure that data were collected accurately. A researcher took observational notes during each focus group.

The researcher began the focus groups by introducing herself and explaining the student assent forms. The students who had not received permission were kept in the same classroom and were allowed to watch the videos but not participate in the discussion and were not video recorded. Each participant had a number displayed on a small placard on the desk, and the researcher asked the student to record the number on the desk onto the intake form. The form allowed the researcher to later differentiate Hispanic students from non-Hispanic students when transcribing the focus group videos.

The researcher used a semi-structured focus group guide. A series of structured questions were asked; however, there was room for more in-depth conversation in order to obtain additional information. After showing each video, the researcher asked participating students a series of questions. She presented the questions as conversational, and sometimes rephrased or omitted questions to elicit more detailed responses. After the interviews, the researchers took the opportunity to present a brief information session about CASNR and agricultural careers. Post-interview reflection and notes were written between classes and at the end of each day.

The researcher transcribed each interview into separate word documents, organized person by person, labeling the document with the participant’s pseudonym. Upon the completion of the transcriptions, themes naturally began appearing. The researcher developed a list of common words and phrases that were repeated. The data were imported into the qualitative data analysis software, NVivo 10, and were formally analyzed using open and axial coding. Open coding is categorizing information and examining properties and dimensions of the data (Creswell, 1998). The researcher organized the information into different nodes, which represented the main points talked about in the focus groups. After open coding, nodes were created and main points were organized. The researcher went back into each node and coded that information into individual nodes, or subcategories.

The following factors limited this study: The area surrounding Texas Tech University has a smaller percentage of Hispanics compared to the rest of the state, making it difficult to get a true representation of the statewide demographic; parents with a negative view of agriculture may not have permitted their child(ren) to participate in the study; at one school, the teacher did not have alternative plans for students without a parental permission slip and allowed those students to stay in the room with the focus group participants, and potentially caused some participants to stay quiet; a few students were uncomfortable speaking English, and although the researcher spoke Spanish they did not actively participate; a large beef packing facility in one of the participating communities closed nine months prior to data collection and may have negatively impacted the participants’ attitudes toward careers in agriculture.

**Researcher Bias**
The lead researcher is a second generation Mexican American and grew up in a rural town in an agriculturally based region and had firsthand knowledge of the negative perception Hispanics have for agriculture. The researcher’s father’s family migrated from Mexico and worked as...
migrant field workers. Because of all of the years spent working laborious jobs, the researcher’s father did not support her decision to study agriculture, encouraging her to study something more “practical.” Eventually, he supported her endeavor to pursue a bachelor’s, and then a master’s degree in agricultural communications because he knew any type of education was the key to a better future.

**Trustworthiness**

Credibility was accomplished through triangulation of data sources. The different interviews, from different groups of students at the different high schools looked at the same issue and same questions. After reviewing the data, the outcomes in each focus group were essentially the same, thus leading to a true, accurate outcome. Transferability was accomplished through the researcher’s efforts to describe the findings in such a way that conclusions could be drawn and the findings could be related to previous studies conducted in similar contexts. An audit trail including recordings of focus groups, post-focus group reflections, interview transcriptions, NVivo coding files, and observational notes achieved dependability and confirmability.

**Findings**

Because non-Hispanic students and Hispanic students could not be separated during focus groups, both demographic students were asked questions and evaluated and attitudes, behaviors, and beliefs were compared to determine whether or not Hispanic students were really different from their counterparts.

**Research Question 1 – What Influences Non-Hispanic Students’ to Choose a Major, College, or Career?**

The researcher identified major themes related to influences on the students’ decisions to select a major, university, and career opportunities: money, activities, and size/distance. All students agreed that money was an important factor when deciding educational pathways – whether it was the coast of attending a university or salary that could be made in a particular career. Various students stated cost would determine whether or not they would attend a community college or a four-year university. In relation to money being a deciding factor for career choice, one student stated that money would sway his career choice if it meant he would not have to attend school for four years.

Non-Hispanic students listed proximity to home, the size of the university, and class size as influential factors when selecting a college. According to one student, not only does a college have to be in close proximity to home, it must also be comfortable and welcoming.

Non-Hispanic students mentioned activities as an influence when selecting a school, citing parties, clubs, and extra-curricular activities as “good ways to spend outside of class.” Students suggested that there was more to college than academia. According to Ethan, “I think it’s important to show that ‘ag’ kids can participate in sports and extra-curricular activities; just because we’re in agriculture doesn’t mean we’re limited to agriculture stuff.”
Research Question 2 – What Influences Hispanic Students to Pick a Major, College, and Career?

Through open coding, the researcher identified major themes related to influences on the Hispanic students’ decisions to select a major, university, and career opportunities: money, opportunities, quality, proximity to home, and activities.

Most Hispanic participants asked about tuition, available scholarships, and the financial aid process. According to the Hispanic participants, money was a major influencing factor in their decision on a career pathway. Marcos stated, “It’s all about the money. If I was interested in two different things and one made more money than the other, I would go for that one.” Of the 46 Hispanic participants, only two – Rick and Mary – did not cite money as an important deciding factor in choosing a career; however, they did note that it would “be nice” to make a lot of money. According to Rick, “Of course money is always going to be a big factor for me. But honestly, money isn’t everything. Everybody would love to have it but it’s just something that comes and goes.”

Almost all the Hispanic participants were unaware of the different career opportunities in agriculture. Prior to learning about the different non-traditional routes in agriculture, participants cited the “lack of jobs” as their reason, and several noted it was a profession for White males. After watching the videos and learning about the different routes, many, but not all, Hispanic participants stated the opportunity for different non-traditional jobs as an interest and the reason they would possibly consider agriculture. Ease of job placement was a major concern for Hispanic participants. Although they were told there are opportunities to take different, non-traditional routes in agriculture, they wanted to be ensured that they would get a job upon completion of a baccalaureate degree. As Marcos said, “I don’t want to take a chance on it, go to school for a long time, and then not be able to find a job.”

Quality of the institution and degree program was another important factor for Hispanic students, including the reputation of the school and the ease or difficulty of the academic program. When speaking about academic departments, Zeke said, “I want to know the reputation of the department. Is it good? Am I wasting my time and the money I don’t have?” A few students wanted to know the level of difficulty (or ease) of the program. According to Gabriel, “If it’s too hard, I probably wouldn’t do it. I don’t want to go to school for a long time and have trouble in classes and get discouraged. I want the easiest, fastest route.”

Hispanic students said attending a school close to home was a deciding factor. The size of the university campus and the size of the city/town in which the campus was located is also important. “I’m a momma’s boy and family is important. I want to go to a college that isn’t so far away that I can’t go home often and check-up on my parents, but not too far away that I can’t have my own freedom to do whatever I want,” Javier said. While Javier was speaking, the researchers observed many other Hispanic students smiling and nodding their heads to agree with Javier. Zeke agreed with Javier, stating, “I don’t want to get lost in the crowd.”

Although they were going to school to better their lives, Hispanic students said activities such as intramural sports, parties, and clubs played an important part in their decision process.
With the aforementioned themes influencing all the participants, both Hispanic and non, nearly all students stated there was a person, generally their parents, whose opinion they valued. Although they valued the opinion of their respected significant other, they would not change their academic or career pathway if their significant other did not approve. Javier said, “I know my parents are going to tell me what they think is best for me, but they didn’t go to college. What I want to do with my life is up to me.”

Research Question 3 – What Messages do High School Students Want to See in Recruitment Videos for CASNR and Agricultural Careers?
The researcher identified major themes the participants said they wanted to see in college recruitment videos: money, opportunities, and activities. All students stated that if they were making CASNR recruitment video for their peers, cost of tuition and scholarship opportunities would also be messages to emphasize. If participating students were going to make a video to recruit their peers into agricultural careers, most students agreed that talking openly about the money that can be made in agriculture is a motivating factor. Joey said, “Not a lot of people think you can make money in ag. I think it’s important to show that.”

Non-Hispanic students were more educated in the different career opportunities in agriculture, but after watching the recruitment videos and learning about agriculture, Hispanic students stated that there should be more of an emphasis on the different areas of career opportunities in agriculture. As Ethan stated, “Show kids that it’s more than cows, plows, and sows. You don’t have to be a farmer to be in agriculture.”

Both Hispanic and non-Hispanic students agreed that an emphasis should be placed on activities. Both groups of students stated that, “school is more than class, we need to have fun, too” and “there is so much more than the classroom that makes up the college experience.”

Conclusions

Although colleges of agriculture are working to specifically recruit Hispanic students, by and large, the Hispanic and Non-Hispanic students in this study had similar views on college, majors, and careers. Both groups of students were interested in money (cost of tuition and earning potential), which came up often in every focus group session. Size of school, distance from home, and activities were also important factors. This tied back to Chapman’s (1981) model that listed external influences (cost, financial aid, and location), as motivating variables in the college choice decision. For the most part, the participants stated that proximity to home was an important factor and spoke about their desire to attend Texas Tech University or [area community college] because of the proximity. This implies that Chapman’s (1981) suggestion that prospective students in an area with many colleges are unlikely to travel very far to college.

All the students were interested in extra-curricular activities, similar to the Jones et al. (2002) finding that students saw multiple roles in their college experience and found academics to only be part of it.

Socioeconomic status acts as a backdrop to college and degree choice, which influences a series of attitudes and behaviors, and SES is positively related to aspirations and expectations (Chapman, 1981). According to the participating agriculture teachers, the majority of the Hispanic students interviewed in this study were below average SES. Aside from potential
career earnings, the cost of tuition also impacted their decision. Students from homes with higher SES are more likely to attend a four-year institution than students from homes with average or below average status (Gandara, 2010). Unfortunately, recruiting these underprivileged students can be difficult because of financial obligations. Most of the participants said they were more likely to change their career choice if it meant they would make more money.

The Hispanic students lacked information and knowledge about agriculture. Prior to watching the recruitment videos, nearly all students said they think of farmers when they hear the word agriculture. In one focus group, a Hispanic participant pointed at a non-Hispanic boy and said, “He looks like a farmer.” When asked why, he responded, “Because he’s White.” This statement supported Wiley’s, et al., (1997) statement that images of agriculture tend to project a profession for white males. This example confirms that students and parents who are familiar with the agricultural industry have a more positive attitude toward agricultural as an educational pathway and careers than those who do not come from an agriculture background. In a similar study, Outley (2008) found that negative perceptions of careers in agriculture and natural resources are also a major barrier to recruitment and retention of minorities. Roberts, et al., (2009) and Romero (2010) found that Hispanic students tend to have more negative perceptions of agriculture because they associate it with what they know – hard labor. Because of this negative perception, some participants would not see the science or business aspect of the agricultural industry.

Although most of the non-Hispanic participants did not plan on pursuing an education in agriculture, they said it was not because they did not like agriculture, rather they were interested in different areas of study. As mentioned by Rick, “I have a respect for it. I know that without it, we wouldn’t have food or clothes, and I know it’s important. I think it’s a career, but not for me.” The respect these students have for agriculture confirms Scott and LaVergne's (2004) finding that although students did not choose to enroll in agriculture classes, they still had a respectable opinion of agriculture, however, their lack of information of the field made them less confident in being able to prepare for those educational pathways and careers.

Several of the non-Hispanic participants were familiar with CASNR at Texas Tech University and had been educated about the smaller class sizes and welcoming atmosphere CASNR offered. This affirms Wildman and Torres’ (2001) findings that the friendliness of the faculty and college can lead to the student selecting a major or career in agriculture. In a similar study, Wimmer and Meyers (2013) found that students experienced a sense of enjoyment and belonging in CASNR. Adams (2012) found students called CASNR home and liked knowing that most of the students and professors knew each other and made an effort to look out for each other. Most of Adams’ (2012) participants said CASNR at Texas Tech University was a large, welcoming family.

Literature showed that significant others play an important role in the decision process. Jones and Larke (2003) stated that significant people have been greatly influential for minority students. When asked if there were significant people in their lives, or whose advice they value, nearly all students, both Hispanic and non-Hispanic, stated that it was their parents. However, when the researcher asked if the students would be more willing to change their educational or career choice because their parent did not agree with their initial decision, nearly all participants, both Hispanic and non-Hispanic, said no. This was supported by Scott and LaVergne's (2004) findings that influential people were the least motivating factor for students to enroll in
agriculture majors. In the case of our participants, although they thought it was important to take their significant people’s advice, ultimately, their life decisions were based on what they wanted to do. Interestingly, almost all the participants, Hispanic and non, expressed a desire to find a college or university close to home and their parents.

**Recommendations**

In producing recruitment videos, students suggested highlighting earning potential for careers in agriculture. They also wanted to know about non-traditional career opportunities, for example, majoring in animal science and then attending medical school. Students also wanted to see life outside of the classroom, such as extra-curricular activities. The researchers observed very little, if any, differences in the messages that Hispanic and non-Hispanic students wanted to see in the recruitment videos.

Hispanic parents are significant, influential people in their students’ lives. It is important to study Hispanic parents and evaluate if they are, or are not, supportive of agricultural careers. The initial step of recruiting Hispanic students lies in earning the trust of the parents and convincing them that agriculture is a viable and sophisticated field.

Many participants in the study were sophomores in high school who had an idea of where they wanted to go to college but were not serious about beginning the college choice process. Most of the students had an idea of what they wanted to be and where they wanted to go to school, but were not serious about their options. It is recommended to study college freshmen, at both two-year and four-year colleges. College freshmen recently made their college and major decisions and can express what factors really influenced their decisions and what messages really sold them. Also, college freshmen are more experienced with the financial aid process and scholarships and are more aware of their financial situation. Their views toward money and finances may be different from high school students.

**References**


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Attributes and experiences affecting student retention

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Abstract

Retention is important to the wellbeing of both the student and the institution. Research shows student involvement within the institution is key to student persistence (Pascarella & Terenzini, 1991). This study sought to identify and describe the College of Agricultural Sciences and Natural Resources (CASNR) at Texas Tech University students’ perceived pre-entry attributes and institutional experiences in relation to retention. Based on Tinto’s (1993) Longitudinal Model of Institutional Departure, there are four institutional experiences students have: academic performance, faculty and staff interaction, extracurricular activity, and peer group interaction. Two instruments were utilized in this study: Engage, given to incoming CASNR freshmen in 2010 and 2011, followed by the institutional experiences instrument given in 2014 to the same accessible population. Results indicated the Engage survey was a moderate predictor of academic performance, but not overall retention-aiding student experiences. The study found there was a substantial relationship between the four institutional experiences, and if a student found one favorable, they were more likely to find the others favorable as well. Participants who stayed within CASNR had an overall more favorable experience in the four categories than those who chose to leave the college.

Introduction/Theoretical Framework

Retention has been a topic of concern for those in higher education for some time. It can be seen as a failure upon the university when a student’s needs are not met, and progress and growth is not encouraged (Krumrei-Mancuso, Newton, Kim, & Wilcox, 2013). Success during college helps students meet long-term personal and career goals and provides a range of monetary, psychosocial and physical benefits (Baum & Ma, 2007). In today’s society, college leads to opportunities and experiences one might not otherwise have access to receive (Tinto, 1998). According to the National Center of Educational Statistics (NCES, 2013), the enrollment rate for universities in the United States has steadily increased and is projected to reach 20.3 million students (12 % rate of increase) by 2021. Conversely, the likelihood of an undergraduate student enrolled in a four-year university completing a degree program within six years still remains relatively low at 59% (NCES, 2013).

Retaining students is becoming increasingly important as state governments begin to look at changing university funding models to performance-based funding; incorporating retention and graduation rates into the equation. For many financially concerned institutions, recruitment programs are expanding and encouraged. Recruitment is a process used to encourage students to enroll in an institution, not keep them there. As more universities have begun to receive funding based on their performance rates, it becomes instrumental to the financial stability of the college.
to retain their students. Every student admitted into a program deserves a certain level of commitment from the university in academic, personal, and program support (Krumrei-Mancuso, et. al, 2013). Students who do not persist with the university until graduation not only miss out on benefits that come with a degree but have also wasted precious time and resources if they do not graduate. Universities also lose a source of future revenue in the form of tuition and fees, as well as the time and resources used on the departed student.

Tinto (1993) addressed several ways in which universities can assist students in their quest of persistence through their time in school. In order for a student to be retained, involvement is a primary factor, both academically and socially (Tinto, 1998). After two decades of research, Pascarella and Terenzini (1991) stated, “one of the most inescapable and unequivocal conclusions we can make is that the impact of college is largely determined by the individual’s quality of effort and level of involvement in both academic and non-academic activities” (p. 610). Often, a student’s involvement academically or socially will assist them in becoming more committed to the university in which they are associated. Stage (1989) found students are more likely to be retained if they are involved within the university they attend. Academic and social interactions have the largest affect during the student’s first interactions with the university, typically during their freshmen year (Tinto, 1998).

Le, Casillas, Robbins, and Langley (2005) and Peterson, Casillas, and Robbins (2006) found there is growing evidence that academic success behaviors should be modeled with additional relevant attributes, including psycho-social factors. The interrelation of social factors and individual thought and behavior can affect student’s academic performance and dropout rate, especially during the first year of college (American College Testing, 2013). Studies have revealed a number of these psychosocial factors have greatly contributed to predicting college retention when other factors such as socioeconomic status, standardized academic (ACT/SAT) scores, and high school GPA are controlled (Robbins, Lauver, Le, Davis, Langley & Carlstrom, 2004).

The theoretical framework of this study is Tinto’s (1993) Longitudinal Theory of Institutional Departure, which describes student departure over a longitudinal period and the decision process involved for those individuals (Figure 1). According to the model, there are six phases a student goes through that impact a student’s likelihood of being retained or departing from the university prematurely. This model begins before the student reaches college, continues throughout their time in college, and ultimately, if and when they depart with a college diploma. This study primarily focuses on the first three stages of Tinto’s model: (1) pre-entry attributes, (2) goals and commitments and (3) institutional experiences.
Figure 1: Longitudinal Model of Institutional Departure (Tinto, 1993)

Pre-entry attributes and goals and commitments are two stages incoming students experience prior to arriving at the university (Tinto, 1993). The experiences a student has in the first two stages can play a role in determining their success at an institution. As shown in Figure 1, student’s pre-entry attributes are the factors which initially lead to their commitment to the university and goal of a future degree and career. Prior educational experiences, personal background, and a student’s skills and abilities to be successful in college influence their academic success, as well as how well they interact with and get involved in the institutions academic and social systems (Coll & Stewart, 2008).

Although a student’s background, personality, and past experience have a significant impact on a student’s goals and commitments to the institution, the events and experiences that take place at the university lead to an even greater commitment, or none at all (Tinto, 1993). During the institutional experiences stage, the university as a whole has the opportunity to positively influence the path a student takes toward degree completion.

There are two systems in which students interact with the university: academic and social. Both of these systems independently influence persistence in different ways for different students, but they also interact in developing a higher or lower level of commitment to the institution (Tinto, 1998). Stage (1989) found students are more likely to be retained by the institution when they are involved either academically or socially within the institution, but even more committed when these systems interact. The Tinto’s (1993) model also suggests the role of formal and informal interactions within the institution. It may go without saying that formal interaction with the institution in the scope of academics is important to the retention status of a student. An individual who does not involve themselves within the academic setting is usually due to a mismatch between the student’s skill level and the university’s expectations that ultimately can lead to early departure. Interactions with faculty and staff also play a role in the academic system during a student’s experiences at the institution. Positive interactions with faculty and staff provide an opportunity for increased commitment to the institution, degree program and integration in academics (Pascarella & Terenzini, 1980). Extracurricular activities and having close relationships with fellow students can have a direct effect on an individual’s feelings of belonging and purpose. Going to college can be a difficult transition for some and students may
want to depend on someone in a time of stress or new situations, whether that is parents, faculty or peers (Adams, 2012). Events that happen in one stage of the model unavoidably influence reactions in other stages (Tinto, 1993) this is also true when looking at events that occur within the formal setting and the informal setting in a particular system.

**Purpose/Objectives**

The purpose of this study was to identify and describe CASNR students’ perceived pre-entry attributes and institutional experiences in relation to retention. Knowing what affects CASNR students at Texas Tech University may influence strategic retention efforts made by the college to retain students. The following research objectives guided this study:

1. Compare participants’ Engage indices and institutional experience variables by retention status.
2. Describe the relationship between participants’ Engage indices and institutional experiences.

**Methods/Procedures**

The target population for this study was students who attended CASNR orientation as first-time freshmen in 2010 or 2011 (N = 503). In order to be contacted in 2014, students must have signed a future contact consent form and provided contact information. The accessible population in 2014 was 347 (N = 347) students.

Two instruments were utilized for this study. The first was the Engage survey given to incoming CASNR freshmen at orientation in the summer of 2010 and 2011. Engage (formerly known as the Student Readiness Inventory or SRI) was developed by the American College Testing (ACT) organization to predict factors influencing performance and retention based on personal factors students develop prior to college, such as motivation and skills, social engagement and self-regulation (ACT, 2013). The 10 scales, which make up the Engage indices, coincide with students’ pre-entry attributes and their goals and commitments within Tinto’s Longitudinal Model of Institutional Departure. Ultimately the results of the instrument provide students with two indices. The academic success index is a predictive score measuring the probability the student will receive a 2.0 or above GPA, and the retention index measures the probability the student will return to the university for a second year. These two indices can help identify students who are at-risk of not being retained by the university. The scales of the Engage instrument have face and content validity ranging from α = 0.72 to 0.87, median α = 0.82. (Le et al., 2005).

The second instrument was an online survey developed by the researcher from investigating existing literature, primarily Tinto’s Longitudinal Model of Institutional Departure (1993). The instrument focuses on the four categories a student experiences while in college: academic performance, faculty and staff interactions, extracurricular activity, and peer group interaction. Additional questions were then adapted using a panel of experts in the field and from various studies that followed Tinto’s model. The following studies assisted in question development: Dunn, Hains & Epps, 2013; Dudley, 2011; Street, 2009.
To establish content and face validity the instrument was sent to six professors and staff at Texas Tech University who had a specific interest in the subject matter of retention. A pilot test was then conducted on November 25, 2013 to CASNR freshmen enrolled in an introductory college class. The sample (N = 21) used for the pilot test was appropriate because the students participated in the Engage survey during 2013 summer orientation, were first-time freshmen students, and were approaching the conclusion of their first semester in CASNR. The data collected during the pilot test was analyzed through the use of SPSS for Windows. The Cronbach’s alpha coefficients were computed to check the internal consistency and reliability of the instrument (range α = 0.80 to 0.95, median α = 0.90)

The purpose of this instrument was to assess the extent, if any, the four domains related to student retention. The instrument was made up of four sections pertaining to Tinto’s (1993) model. Students were also asked several demographic questions.

In the online instrument, each section had a six point Likert-type scale (1 = strongly disagree, 6 = strongly agree), to determine the level of agreement. The construct was made up of five elements and each element contained two statements; one statement was positively worded and the other was negatively worded. All negatively worded phrases were recoded prior to data analysis. Responses for the two statements were averaged together, resulting in an overall element score.

The first section (α = 0.90) focused on student’s experiences pertaining to their academic performance during their time in CASNR. Students were asked 15 questions related to academic records and past performance; these questions were self-reported by the student. The section also contained a six point Likert-type scale (1 = strongly disagree; 6 = strongly agree), to determine how favorable or unfavorable were a student’s self-perceived academic experiences. These statements focused on student’s perceived ability, satisfaction with education received from CASNR, and personal effort exhibited in the classroom.

The second section (α = 0.93) dealt with student’s interactions with faculty and staff within the college. Statements within the construct asked about student’s interactions outside of the classroom with CASNR faculty and staff, professional relationship with advisor, and if they felt comfortable going to a CASNR faculty/staff member for advice or emotional support.

The third section (α = 0.91) focused on student’s extracurricular activities on both the college and the university level. Students responded how favorably or unfavorably they identified with statements concerning their sense of belonging, effort to attend CASNR events, participation, and level of enjoyment. In this section students were also asked to identify CASNR and Texas Tech University events and activities they had participated in during their time at the institution. Respondents were able to check all that applied. Students were also asked to identify how many clubs or organizations they were a member of as well as any leadership positions they held.

The fourth section (α = 0.94) concentrated on peer group interactions. This section contained statements on a six point Likert-type scale to determine the level of favorability a student found their interactions with peers in CASNR. Statements focused on relationships with peers, outside of the classroom community with other CASNR students, and inside the classroom interactions.
Data collection began on January 7, 2014 by sending a recruiting email to the population (N = 347). The recruiting email reminded the juniors and seniors contacted of their involvement in the Engage survey at orientation and outlined the purpose of the study. The survey was distributed using Qualtrics, an online survey distribution site and was signed by the [College of Agriculture] Associate Dean for Academic and Student Programs. The email indicated the opportunity to share experiences had as a student in order to help the college better understand the needs of its students. The email also expressed the opportunity to be included in a drawing for a $50 Barnes and Noble gift card for participating in the study.

Nonresponse error can be a threat to external validity and in order to protect the findings, the researcher must follow necessary procedures in handling nonresponse bias (Lindner, Murphy & Briers, 2001). Successive waves are an extrapolation method used to eliminate nonresponse bias (Armstrong & Overton, 1977). An extrapolation method is based upon the assumption that “subjects who respond less readily are more like nonrespondents” (Armstrong & Overton, 1997). Nine reminder emails were sent from Jan. 9 – 25, signed by the Associate Dean for Academic and Student Programs and the researcher. A response rate of 60.8 percent was obtained (N = 211). Students who responded to the last three waves (N = 28) were then compared to the early respondents. Descriptive statistics were performed on the four institutional experience variables to determine if there was a difference between early and late respondents. Table 1 indicates there was no significant difference between the two groups.

Table 1

<table>
<thead>
<tr>
<th>Instrument Scale</th>
<th>Respondents</th>
<th>Late respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Performance</td>
<td>3.9</td>
<td>4.0</td>
</tr>
<tr>
<td>Faculty and Staff Interactions</td>
<td>4.8</td>
<td>4.7</td>
</tr>
<tr>
<td>Extracurricular Activities</td>
<td>4.9</td>
<td>4.7</td>
</tr>
<tr>
<td>Peer Group Interactions</td>
<td>5.3</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Note: Scale: 1 = strongly disagree; 6 = strongly agree

Before analysis was performed, surveys that did not have sufficient information to draw from were purged from the data. There were a total of 25 individuals who only provided demographic information and could not be used. Several individuals provided information for one or more of the instrument sections but not all four.

Inferential statistics were utilized in this study. To answer research objective one, t-test for independent means were employed to compare the mean scores and determine if there was a significant difference between the variables based on retention status. To answer research objective two, a Pearson product-moment coefficient was run to determine the relationship between participant’s pre-entry attributes and institutional experiences. The population of this study is specific to CASNR at Texas Tech University resulting in a generalizability limitation. Over the past decade CASNR had higher retention rates than the university average, ensuing difficulty in pinpointing a difference between those retained and not retained.
Results/Findings

Participants who completed the survey fell within one of two retention categories. The data analysis revealed 85% (n = 168) of the respondents were retained by CASNR while 13.5% (n = 25) were not retained. There were three respondents whose retention status was unknown and two individuals whose Engage indices were unknown; all five were excluded from the analysis.

The first objective for this study was to compare CASNR students’ Engage indices and institutional experience variables – academic performance, faculty and staff interactions, extracurricular activity, peer group interaction – by retention status. The two Engage indices were compared by retention status: Academic Success Index and Retention Index.

An independent sample t-test was conducted to evaluate the research objective, comparing each variable by retention status. The null hypothesis states there is no relationship. Leven’s test for equality of variances was not significant, so equal variances could be assumed for the analysis. The test was not statistically significant $t(184) = 0.12, p = 0.90$. The null hypothesis was accepted based on the significance of the alpha level set at 0.05 a priori.

Table 2
*CASNR Student’s Engage Academic Success Index by Retention Status (N = 184)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$M$</th>
<th>$SD$</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASNR Retained</td>
<td>79.68</td>
<td>20.92</td>
<td>0.12</td>
<td>0.90</td>
</tr>
<tr>
<td>CASNR Not Retained</td>
<td>80.24</td>
<td>22.18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: * = $p < 0.05$; Scale = 1 to 99

The same method of an independent sample t-test was utilized to compare participants’ retention index by current retention status. Table 3 illustrates the results of this test. There was not a difference between those students who were retained by CASNR ($M = 78.12, SD = 22.17$) and those who were not retained by the college ($M = 80.92, SD = 17.64$). The alpha level was set a priori ($p < 0.05$) thus there is not a statistically significant relationship between CASNR student’s retention index and retention status.

Table 3
*CASNR Student’s Engage Retention Index by Retention Status (N = 184)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>$M$</th>
<th>$SD$</th>
<th>$t$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASNR Retained</td>
<td>78.12</td>
<td>22.17</td>
<td>0.60</td>
<td>0.55</td>
</tr>
<tr>
<td>CASNR Not Retained</td>
<td>80.92</td>
<td>17.64</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: * = $p < 0.05$; Scale = 1 to 99

An independent sample t-test was conducted to evaluate the hypothesis that those students who were retained by CASNR would rate experiences had concerning academic performance within the college would be higher than those who left the college. There was not a significant relationship between the two variables ($p = 0.08$) at an alpha level set a priori ($p < 0.05$). On average, those who had more favorable views of academic performance were more likely to be retained ($M = 40.59; SD = 10.28$) than those who were not retained ($M = 36.58; SD = 11.39$).
Table 4  
**CASNR Student's Academic Performance by Retention Status**

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASNR Retained (N = 155)</td>
<td>40.59</td>
<td>10.28</td>
<td>1.75</td>
<td>0.08</td>
</tr>
<tr>
<td>CASNR Not Retained (N = 24)</td>
<td>36.58</td>
<td>11.39</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: * = p < 0.05; Scale = 1 to 60

In order to identify if there was a relationship between respondent’s favorability of their faculty and staff interactions and whether or not they were retained by the college, an independent sample t-test was performed (Table 5). The results show there was a significant relationship, \( t(176) = 4.67, p < 0.0001 \). Students who were currently enrolled in CASNR and those who had already graduated from CASNR at the time of data collection were likely to have a more favorable experience in terms of their interactions with CASNR faculty and staff. On average, students who departed from CASNR (\( M = 37.74; SD = 9.25 \)) ranked their experience significantly lower than those who persisted in the college (\( M = 48.36; SD = 10.31 \)).

Table 5  
**CASNR Student’s Faculty and Staff Interactions by Retention Status**

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASNR Retained (N = 155)</td>
<td>48.36</td>
<td>10.31</td>
<td>4.67</td>
<td>0.00*</td>
</tr>
<tr>
<td>CASNR Not Retained (N = 23)</td>
<td>37.74</td>
<td>9.25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: * = p < 0.05; Scale = 1 to 60

The null hypothesis stated there was no significant difference between student’s retention status and their experiences with extracurricular activities. Based on the findings of an independent sample t-test (Table 6), the null hypothesis was rejected in favor of the research hypothesis. It was found that students who were retained by CASNR (\( M = 48.05; SD = 8.97 \)) experienced a more favorable outcome from their investment in extracurricular activities (\( p < 0.0001 \)), than those who left the college (\( M = 38.75; SD = 9.68 \)). An alpha level of 0.05 was used in this analysis and set a priori.

Table 6  
**CASNR Student’s Extracurricular Activities by Retention Status**

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASNR Retained (N = 154)</td>
<td>48.05</td>
<td>8.97</td>
<td>4.68</td>
<td>0.00*</td>
</tr>
<tr>
<td>CASNR Not Retained (N = 24)</td>
<td>38.75</td>
<td>9.68</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: * = p < 0.05; Scale = 1 to 60

An independent sample t-test was calculated to discover if there was a significant difference between student’s retention status and their peer group interactions within the college. Students who had departed CASNR (\( M = 40.84; SD = 10.80 \)) at the point of data collection indicated they had a less favorable experience within their peer group interactions than those students who were still retained by the college (\( M = 51.49; SD = 9.44 \)). The results revealed a significant difference between the two groups of participants, \( t(175) = 4.12, p < 0.0001 \). The alpha level was set a priori (\( p < 0.05 \)).
Table 7

*CASNR Student’s Peer Group Interactions by Retention Status*

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASNR Retained (N = 152)</td>
<td>51.49</td>
<td>9.44</td>
<td>5.12</td>
<td>0.00*</td>
</tr>
<tr>
<td>CASNR Not Retained (N = 25)</td>
<td>40.84</td>
<td>10.80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note:* * = *p* < 0.05; Scale = 1 to 60

The second objective was to identify the relationship between participants Engage indices and their institutional experiences. Table 8 demonstrates the correlation between six variables associated with the study: academic success index, retention index, academic performance, faculty and staff interaction, extracurricular activity and peer group interaction. A strong correlation was found between the two Engage indices, which was to be expected. The four institutional experiences had a substantially significant relationship with one another.

The results reveal one statistically significant relationship between the two variable groups. Participants experience in terms of their academic performance is moderately correlated with the two Engage scales, academic success index (*r* = 0.30) and retention index (*r* = 0.33). There was not a significant relationship between the Engage scales and faculty and staff interaction (*r* = 0.12; *r* = 0.14) or extracurricular activity (*r* = 0.12; *r* = 0.12). Although the informal social category in Tinto’s (1993) model, peer group interaction, is substantially related with faculty and staff interaction and extracurricular activity, student’s interactions with their peers had a low, negative relationship with the Engage indices (*r* = -0.02, *r* = -0.02).

Table 8

*Relationship Between Engage Indices and Institutional Experiences*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Academic Success Index (N = 180)</th>
<th>Retention Index (N = 180)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Performance (N = 182)</td>
<td>0.30*</td>
<td>0.33*</td>
</tr>
<tr>
<td>Faculty and Staff Interaction (N = 177)</td>
<td>0.12</td>
<td>0.14</td>
</tr>
<tr>
<td>Extracurricular Activity (N = 177)</td>
<td>0.12</td>
<td>0.12</td>
</tr>
<tr>
<td>Peer Group Interaction (N = 176)</td>
<td>-0.02</td>
<td>-0.02</td>
</tr>
</tbody>
</table>

*Note:* * = *p* < 0.05

**Conclusions/Recommendations/Implications**

Of the participants, 85% (*n* = 168) were considered retained by CASNR 13.5% (*n* = 25) were not retained. Engage sought to forecast the likelihood students would receive above a 2.0 after their first semester and return after their second year by measuring student’s pre-entry attributes and goals and commitments at orientation. CASNR students who took the Engage survey in 2010 or 2011 ranked considerably higher than the national average on their academic success index and retention index; yet, there was not a significant difference between CASNR students who left and those who stayed within the college. The results of this study revealed the Engage instrument did not accurately predict the likelihood a student would persist within the college. There are two factors that could attribute to these findings. First is the concern that the Engage instrument is measuring retention based on overall desire to obtain a degree and not specifically graduate from
CASNR. Two of the 10 scales apply to a student’s perseverance: commitment to college and general determination. The instrument could be measuring a student’s commitment to CASNR, commitment to Texas Tech University or their commitment to obtaining a college degree in general. The second factor could be there is more to persistence than simply academics. Tinto (1993) explained in his research often times a student who was more involved within the college community – academically or socially – they tended to have a more positive experience within the academic realm of the college. There may have been other factors besides academics that either encouraged or discouraged students to leave CASNR.

Conversely, participants who were retained by the college indicated significant differences in their institutional experiences when compared to students who were not retained. Students who stayed within CASNR had a 4.01 higher average in their perceived academic performance within the college. There was not a statistically significant relationship ($p = 0.08$), but there was a difference between the groups in this sample.

Faculty and staff interactions are a part of the academic system of the college, yet oftentimes in an informal manner. Experiences and professional relationships outside the classroom have proven to be extremely beneficial in terms of students’ experience and involvement (Tinto, 1993; Pascarella & Terenzini, 1991). This study found there was a significant difference in the experiences CASNR students had with faculty and staff and the relations had by students that depart. Participants who were retained averaged 10.62 higher in their experiences with faculty and staff than those who left the college. The faculty, more than any other group, have the power to influence the way a student sees and relates to their own college and degree program (Tinto, 1993).

There was also a significant relationship between the two groups and their experience within extracurricular activities, ranging a total of 9.3 point difference on average. Participants were asked to identify involvement on both the university level as well as the college because students who are involved, whether, college, university, or community, end up having a sense of belonging, which in turn can help root an individual to their current situation (Tinto, 1993). The findings coincide with Tinto’s findings because those who left CASNR scored lower in overall involvement than those who stayed. When students are involved in some manner, their sense of isolation drops (Tinto, 1993).

The final experience had by students at the institution fell under the setting of peer group interactions. This is part of the social aspect of the university and is informal in nature. Again, there was found to be a significant difference between the interactions had by leavers and stayers. Finding a place in the social system allows a student to mentally connect and find their place within the college (Tinto, 1993). Students who were retained by CASNR established relationships with other students in CASNR, unlike those who were not retained.

The second research objective described the relationship between two groups of variables, CASNR student’s Engage indices and the four categories of institutional experience. Data from the Engage survey given in 2010 and 2011, as well as the Institutional Experiences instrument given in 2014 to the accessible sample, were analyzed in reporting these conclusions. Both groups of variables were found to have strong statistical relationships and have a direct influence
on one another. ACT (2013) emphasizes the relationship GPA and academic standing have on a student’s ability to persist or desire to withdraw from the institution. Tinto (1993) concurs that students must meet academic requirements set out by the university in order to be able to stay. The findings coincide, revealing one statistically significant relationship found between the Engage indices and a student’s self-perceived academic performance.

Texas Tech University reported test scores of admitted students by college until 2008. Each year, CASNR had a lower or equal to admitted student test scores (ACT/SAT) when compared to the university average (TTU Factbook, 2013). But overall retention rates have been higher than the Texas Tech University average for the past decade. Consistent with Tinto’s model, the findings of this study emphasize the importance of a student’s institutional experiences and involvement within the college to retention.

Participants in this study did not differ in academic success index or retention index. Research has shown there are other factors, such as psychosocial variables, that affect a student’s college career other than GPA (Tinto, 1993; Pascarella & Terenzini, 1991; Krumrie-Mancuso, et. al, 2013). There are many outside sources that influence students from multiple angles. The institution has a small sphere in which to sway students to continue toward degree completion. This study found three of the categories had a substantially significant relationship with one another: faculty and staff interactions, extracurricular activities, and peer group interactions. Although each of these categories is extremely different in what they mean and entail, within CASNR, they are linked to one another. CASNR faculty members are often advisors for the clubs and organizations in the college. CASNR is one of the smaller colleges on campus, resulting in an atmosphere cohesive to peer group interactions and fostering relationships. CASNR is the only college on campus to still participate in faculty advising which gives students another means to create professional, outside the classroom relationships with faculty and staff, as well as encouragement to get involved. The two systems – academic and social – interact and help to generate more involvement overall (Tinto, 1993; Stage, 1989).

The forth experience, academic performance, had a moderate relationship between faculty and staff interactions and extracurricular activities. The results coincide with Tinto’s (1993) findings concerning the mutually interdependent and reciprocal relationship of the two institutional systems. CASNR is committed to advancing knowledge by providing the highest standards of excellence in education, research, creative activity, outreach, and engagement for current and emerging agricultural and natural resource issues (2011-2015 CASNR Strategic Plan).

Pre-entry attributes influence students but they are already set before individuals get to the university. Engage did not predict participants overall experiences but CASNR students had higher rated experiences than those who left, even though there was not a difference between their academic performance index or retention index. The findings of this study reveal a student’s institutional experiences once they are within the college more so affect their retention status than individual pre-entry attributes.

Future research should dive deeper into reasons why CASNR students depart prematurely from the college. Similar studies performed in other colleges at Texas Tech University and at other agricultural colleges across the nation would give a broader scope of issues affecting student’s
retention status. This particular study should also be replicated on other groups of students within CASNR.

Based on the findings of this study, CASNR administration and staff should increase awareness of the importance of well-rounded, involved students are to their own personal development and academic success in the college. If a student has a positive relationship with faculty members in the college and is involved in at least one club or organization, the greater the likelihood they will also have a positive experience in their academic performance.

CASNR administration has the responsibility to continue developing programs and events that encourage involvement, both formally and informally, to increase integration within the college. First-time freshmen students are at risk of departing before obtaining a degree (ACT, 2013; Tinto, 1993). Freshmen orientation is an opportunity to encourage participation and high academic integrity, emphasizing the long-term benefits to a student’s future. An incoming student brings a unique background and past experience but based on the findings of this study, the experiences had while they are in the college, have a greater impact on their retention status. CASNR administration, faculty and staff can utilize the influence they have with their students.

The participants who were retained by CASNR were overall more well-rounded than those who left the college. Stayers had stronger connections to faculty and staff, were involved in at least one club or organization and had positive relationships with their peers. In turn, these students performed academically with an average GPA of 3.19. It is important to remember the goal is not only to encourage students to be strong academically, but recognize the value of a well-rounded individual who is going to excel in the real world, both mentally and relationally.

References


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A Descriptive Analysis of the Barriers to Incorporate STEM Concepts for 4-H Leaders and FFA Advisors into Livestock Projects

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John Rayfield, Texas A&M University
Kate Wooten, Texas A&M University

Introduction/Need for Research

Pressure has been placed on all levels of education to implement the science, technology, engineering, and mathematics (STEM) integration initiative. STEM is intended to help students enhance their knowledge and understanding of STEM subjects through interconnected-subject, contextual education. Agricultural education programs offer students the opportunity to increase STEM knowledge through participation in a livestock SAE project (Rusk, Summerlot-Early, Machtmes, Talbert, & Balschweid, 2003). Grounded in science and mathematical principles, raising livestock provides students with firsthand experience in animal anatomy and physiology, genetics, nutrition, health, marketing, accounting, and record keeping, all of which are related to STEM concepts (Gamon, Laird, & Roe, 1992; Melodia & Small, 2002). The purpose of this study was to identify potential barriers that prevent STEM concepts from being incorporated into 4-H and FFA livestock programs.

Conceptual Framework

Integrating STEM concepts into career and technical education programs, such as agricultural education, provides “career preparation, skill development, and lifelong learning” (Brand, 2003, p. 3). As the expectations of agricultural education programs shift from preparation for students to return to the farm to preparing students for college, agricultural education teachers also have a responsibility to increase the scientific and technological nature of agricultural education (Budke, 1991). Sawyer (1987) stated that developing animal science knowledge and gaining life skills are important for students to learn through participation in beef, sheep, and swine projects. Sawyer (1987) found that 75% of students utilized the knowledge and skills gained through participation in a livestock project to care and maintain another livestock animal. Similarly, Rusk et al. (2003), found that 4-H members who exhibited livestock “have higher skill levels in the areas of animal health care, animal grooming and animal selection” (p. 9). Rusk’s study is one of the few attempts to take deeper look into the link between STEM concepts and junior livestock projects.

Methodology

This was one part of a broader three round descriptive study that utilized survey research design using the Delphi technique to identify STEM concepts in junior livestock projects. The Delphi method allows an expert panel to identify, react to, and assess differing viewpoints on the same subject (Turoff, 1970). A panel was created including college professors, agricultural educators, extension personnel, livestock evaluation experts, and livestock producers from across the country to represent a population which encompassed the wide variety of regions and livestock species. The panel was comprised of a purposive sample of 26 livestock project experts. The open ended question used to solicit responses for the study was: “What barriers, if any, do you believe prevent the incorporation of STEM concepts into 4-H and FFA programming and
instruction?” Round one yielded a 96% response rate. Round two asked panelists to rate the level of agreement on barriers.

**Results/Findings**

23 livestock project experts responded to the open-ended question on barriers to STEM incorporation resulting in an 88% response rate. Table 1 shows mean scores for specific barriers identified by the panel of experts.

<table>
<thead>
<tr>
<th>Barriers preventing incorporation of STEM</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>No standardized curriculum</td>
<td>4.87</td>
</tr>
<tr>
<td>Lack of understanding of leader/advisor</td>
<td>4.87</td>
</tr>
<tr>
<td>Lack of time</td>
<td>4.52</td>
</tr>
<tr>
<td>Leaders/advisors not willing to change</td>
<td>4.48</td>
</tr>
<tr>
<td>Lack of facilities</td>
<td>4.13</td>
</tr>
<tr>
<td>Higher cost</td>
<td>4.00</td>
</tr>
<tr>
<td>Lack of student engagement</td>
<td>3.83</td>
</tr>
</tbody>
</table>


**Conclusions, Implications, Recommendations**

Panelists did not perceive cost, facilities, lack of student engagement, lack of understanding of leader/advisor, lack of standardized curriculum, leaders/advisors not willing to change, or lack of time as barriers which prevent the incorporation of STEM concepts into 4-H and FFA programming and instruction. Is there disconnect between STEM integration and curriculum development for 4-H and FFA programming? According to the panel of experts, no barriers exist. Further inquiry is needed to validate this phenomenon.

Additionally, experts agree that lack of facilities does not create a barrier for agriculture instructors and 4-H programmers to implement STEM concepts. Does this mean 4-H and FFA programs as a whole have adequate facilities? Are students with livestock projects already equipped with facilities to address this need? Additional research is needed to determine the need/quality of facilities available for STEM instruction. Perhaps the greater challenge from this study is how to market STEM integration to youth program leaders and instructors. One solution possibly lies in identifying programs that effectively incorporate STEM into their programming and showcase them as models of innovation for the development of STEM education and research. Professional development efforts for Extension agents as well as agricultural education teachers could focus on STEM integration as it relates to junior livestock supervision. This could enhance the learning outcomes of junior livestock projects and provide a platform for sharing best practices related to STEM instruction.
References


A Summary of Faculty Perceptions Regarding High Impact Learning Experiences in University Agricultural Education Departments

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Theresa Pesl Murphrey, Texas A&M University
Summer F. Odom, Texas A&M University

Introduction and Need for Research

Faculty and administrators across university agricultural education settings continuously seek new ways to enhance student learning. High Impact Learning (HIL) practices is a term that is being used to describe methods of learning that connect material learned in class with informal experiences through a high level of student engagement (Kuh, 1995; Kuh, 2008). HIL practices are not always understood or defined the same, but share a common theme of having substantial educational benefits for students (Kuh, 2008). For the purpose of this study, a high impact learning practice or experience was defined as an activity that purposefully and systematically encourages students to create new knowledge, make connections across curriculum, explore opinions/views/perspectives beyond their own, and engage in critical thinking (Kuh, 1995; Kuh, 2008). These experiences support the development of “students’ intellectual and practical competencies” (Kuh, 2008). It is recognized that high impact educational practices “take many different forms, depending on learner characteristics and on institutional priorities and contexts” (Kuh, 2008). Examples of HIL include study abroad, internships, research, and class projects. HIL experiences provide benefits for students who are actively engaged (Cruce, Wolniak, Seifert, & Pascarella, 2006; Kuh, Kinzie, Cruce, Shoup, & Gonyea, 2006). College graduates’ ability to think critically has declined over time and research has shown a decline in faculty not teaching to higher standards to challenge their students (Harder, Roberts, Stedman, Thoron, & Myers, 2009). The decline in faculty has limited the opportunities for students to sharpen their thinking abilities (Burbach, Matkin, Quinn, & Searle, 2012; Whittington, 1995). Thus, there have been recommendations that students in higher education complete multiple HIL experiences through their time at college, especially one during their first year (Kuh, 2008).

Understanding perceptions and attitude is fundamental in encouraging the use of HIL learning strategies. While there is substantial research that has been conducted on specific types of HIL (i.e., study abroad), there is little empirical data regarding HIL activities implemented broadly or the attitudes and perceptions of faculty related to HIL. This study sought to determine faculty perceptions of HIL across university departments of agricultural education in an effort to collect baseline data related to faculty perceptions and implementation of HIL.

Conceptual Framework

Examination of faculty perceptions and implementation of high impact learning was divided into three distinct areas including individual characteristics, external elements, and perceptions. These concepts provided the conceptual model to guide this research (Figure 1). A review of literature revealed the importance of the role that individual characteristics and external elements serve in influencing individual views, perceptions regarding comfort, knowledge and ease of
implementation, perceptions of value related to HIL and perceptions of detractors from HIL. We believe that each of these areas impact an individual’s ability and willingness to conduct HIL.

![Conceptual Model](image)

**Figure 1. Conceptual Model to Study High Impact Learning in Departments of Agricultural Education.**

**Methodology**

The study utilized a researcher-developed instrument that included open-ended, Likert-type, and multiple choice questions and followed steps outlined by Dillman (2009). Content and face validity were verified by a panel of experts and a pilot test ($N=45$) was conducted with faculty and graduate teaching assistants prior to study implementation. Eighty-five faculty from ten agricultural education departments nationwide responded to the survey. Likert-type questions included two sets of statements. Cronbach Alpha was used to measure reliability and revealed a reliability of .885 for the set of questions focused on the value of HIL and a reliability of .735 for the set of questions focused on detractors from HIL.

**Results and Conclusions**

The responding sample can be described as predominately male (69.4%) and under 55 years of age (71.8%). A high percentage of respondents (65.9%) had received a teaching award and were in a tenure-track position (81.2%). Likert-type statements with the highest mean scores were, “Undergraduates benefit from HIL experiences,” ($M= 4.86, SD=.56$), and “HIL activities are an important concept to provide for students’ experiences” ($M= 4.79, SD=.599$). The two lowest mean scores were, “HIL distracts from the subject matter content” ($M= 1.56, SD=.981$), and “HIL activities require too much time” ($M= 2.14, SD= 1.09$). The instrument used a five point scale for each statement. Many respondents reported past participation in study abroad experiences, research projects, internships, and on-site learning activities. In regard to their perspectives of comfort level, knowledge level, and ease of implementation for HIL experiences, findings revealed a critical need for support and training related to the implementation of study abroad activities.

**Implications and Recommendations**

Study results reveal a wide variety of HIL activities being implemented while at the same time revealed the need for faculty support and incentives. Individual characteristics and external elements should be considered as departments strive to encourage HIL experiences. This study
was designed to target priority four of the national research agenda, “Meaningful, Engaged Learning in All Environments” (Doerfert, 2011).

References


Agriculture Teachers’ Perceptions of Safety and Supervision Protocol Associated with Supervised Agricultural Experience (SAE) Programming

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Introduction/Need for Research

The importance of individualized supervised agricultural education (SAE) programs as part of the agricultural education experience is acknowledged as part of the complete agricultural education program (Retallick, 2010; Retallick & Martin, 2008). There are many benefits for students who participate in SAE. They develop skills, explore career options, and earn money. Yet, students may be exposed to dangerous or hazardous working conditions associated with production type SAEs. While on farm injuries have declined 57% from 1998 – 2009 (NCCRAHS, 2012; DOL, 2007) the agriculture industry continues to have the second highest rate of young worker fatal injuries (Estes, Jackson, & Castillo, 2010). The development of relevant safety instruction and supervision strategies should serve as a proactive approach to student safety and prevention of agricultural injuries among students engaged in SAE. Therefore, an increased awareness of current SAE supervision practices and safety guidelines will be essential in the development of relevant safety instruction and supervision strategies as a proactive approach to safety and prevention of agricultural injuries among students engaged in SAE.

Theoretical Framework

The theoretical framework which guided this study was the theory of reasoned action and planned behavior (Ajzen, 2005; Ajzen & Fishbein, 1980) which has been used to explain the significant association between health attitudes and risky behaviors. Examining SAE supervision and planning through this theoretical lens, it is hypothesized SAE mentors’ beliefs and behavior may influence students’ beliefs as well as their safety behavior. As part of the theory of reasoned action and planning, agricultural education teachers may feel little control from feeling unprepared to develop or provide technical safety training for reducing injury risks. This would make identifying SAE supervision and safety professional development needs essential to addressing agricultural education teachers’ SAE safety protocols.

Purpose and Objective

The purpose of this study was to gather evidence of NAAE Region I agricultural education teachers’ beliefs towards supervision and planning practices for student safety during SAE activities. Objectives for the study were:

1. Describe Agriculture teachers’ perceptions of mentors’ involvement in SAEs.
2. Identify Agriculture teachers’ perceptions of professional development needs for SAEs.
3. Describe Agriculture teachers’ perceptions of hazardous work tasks for SAEs.
4. Describe Agriculture teachers’ beliefs towards safety guidelines utilized for SAEs.
5. Describe selected demographic characteristics of SAEs.
Methodology

As an organization-level descriptive survey research project, we sought descriptive information from agricultural educators across the United States concerning supervision and safety training provided through supervised agricultural experiences (SAE). This research was reviewed and approved under Utah State University IRB protocol #4704. In the fall of 2013, secondary agriculture education teachers, registered as advisors with the National FFA organization, were surveyed using Qualtrics (online survey software). Agriculture teachers rated 60 items on level of agreement (5 = “Strongly Agree”, 1 = “Strongly Disagree”). A panel of five university agricultural education teacher educators with expertise in supervised agricultural experiences reviewed and determined the survey was content and face valid. Cronbach’s coefficient alpha reliability estimates were used to determine the instrument reliability. A total of 263 surveys were returned with 232 surveys complete and useable for a response rate of 19.2%. Multiple contacts were made to encourage non-respondents to participate in the survey. Telephone follow-ups were conducted with a random sample of 300 non-respondents. All statistical tests were set at an alpha level of .05 a priori. There were no statistically significant differences between early and individuals responding to telephone follow-ups. IBM SPSS Statistics version 20 was used for data analysis. Research questions were analyzed descriptively with frequencies, percentages, means, and standard deviations. For items where the standard deviation exceeded the mean, the median (Mdn) and interquartile range (IQR) were reported.

Results/Findings

The average age of FFA advisor completing the survey was 41 years old (SD = 11.1). The majority of respondents (62.9%, n = 144) self-identified their gender as male. Over half of the respondents (56.5%, n = 130) indicated having completed a master’s degree program at the time of the survey. The majority of Agriculture teachers (65.2%, n = 150) indicated being a single teacher program. For the number of students enrolled in respondents’ programs the median was 100 (IQR = 98). For the number of students enrolled with an active approved SAE in respondents’ programs the median was 50 (IQR = 70). A total of 122 respondents (54.2%) indicated the most commonly completed SAE type was placement followed by 101 respondents (45.5%) who indicated entrepreneurship was the most commonly completed SAE type in their program. The construct “SAE Safety Procedures Perception” had the highest level of agreement (M = 4.12, SD = 0.50) among Agriculture teachers. “Professional Development Need” ranked second (M = 3.93, SD = 0.59) followed by “Mentor Involvement” ranking third (M = 3.72, SD = 0.63) and “Hazardous Work Perception (solitary student SAE tasks) ranking fourth (M = 3.37, SD = 0.78) in the level of agreement among respondents.

Limitations/Conclusions /Implications /Recommendations

A low response rate is recognized as a limitation of this study. Multiple efforts to increase the response rate were taken. Survey responses were provided by participants within the four regions of the National FFA Organization. The reader is cautioned from generalizing the results of this study to populations outside this study. Participants agreed (M = 3.50 – 4.49) mentors are highly involved in planning and supervising student SAE work programs. Participants’ responses suggest that most of planning and supervision of students’ SAE projects falls on the
responsibility of the teacher. Participants were in agreement ($M = 3.50 – 4.49$) that secondary agricultural education teachers need professional development regarding the planning and supervising of SAE work to ensure student safety. Individuals participating in this study agreed that secondary agricultural education teachers should require students to follow SAE safety procedures during work. We conclude this as a positive step in the direction of improving youth safety in agriculture. It is startling that participants’ responses in this study indicated a neutral position on allowing students to complete the hazardous work tasks alone as defined in the Federal Labor Standards Act (DOL, 2007). As students of agricultural education programs progress through their SAE they may improve their perceptions about how to farm safely through the observational learning and modeling of the apprenticeship process (Sanderson, Dukeshire, Rangel & Garbes, 2010). Agricultural education teachers are in a prime position with SAEs to influence the safety culture in agriculture to protect their students. More research should be conducted to determine teachers’ justification for implementing certain safety procedures. This should lead to the development of SAE supervision and safety “best practices” to assist agricultural education professionals in protecting and shaping our future leaders in agriculture.

References


An Analysis of Teacher’s Perceived Competence and Situated Motivation at the Oregon Delta Conference

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Misty D. Lambert, Oregon State University

Introduction/Need for Research

Since its inception by the National FFA Organization in 2006 as a reform model of PD for agricultural educators, the Delta Conference has since been adopted in three separate states—Texas, California, and Oregon. Due to a reprioritization of resources, the National FFA discontinued their own version of the annual conference after two years, leading these states to facilitate their own conferences. Tarleton State University in Texas hosted three annual conferences from 2007-2009; the California Department of Education’s agricultural education unit hosted two conferences, one in 2007 and one in 2009 (K. W. McGregor, personal communication, November 7, 2012), and Oregon agricultural education leaders hosted a conference in the summers of 2012 and 2013 (S. Derner, personal communication, September 9, 2013). Despite its reputation of having a profound impact on teachers’ thinking and performance in the field (McGregor, Bellah, & Coonrod, 2008), in all of the aforementioned Delta Conferences, low attendance was an issue.

Theoretical Framework

Self-determination theory (Deci & Ryan, 1985), hereafter referred to as SDT, provides useful insight into teachers’ motivation to engage in endeavors such as professional development. Conceptualized in 1985, the SDT framework explains human behavior with regard to motivation and personality. Deci and Ryan posit the “quality of experience and performance can be very different when one is behaving for intrinsic versus extrinsic reasons” (Ryan & Deci, 2000, p. 55). This explanation can be particularly beneficial for understanding why teachers may be motivated to partake in a given professional development activity. Our profession’s National Research Agenda calls for us to examine the role motivation plays with regard to learning across the various agricultural education contexts (Doerfert, 2011), and as such, we seek to explore this concept with teachers at the Delta Conference.

Methodology

The purpose of this study was to explore the motivation and perceived competence of teachers before and after engaging in the Oregon Delta Conference. We collected perceived competence data using a 4-item scale (α > .80) first utilized by Williams and Deci (1996). These four items were situated in the conference and included the statements “I feel confident in my ability to learn this material”, “I am capable of learning the material at this conference”, “I am able to achieve my goals at this conference”, and “I feel able to meet the challenges of performing well at this conference”. We collected situational motivation data using the Situational Intrinsic and Extrinsic Motivation Scale developed by Guay, Vallerand, and Blanchard (2000). This Likert-type instrument uses four sub-scales, each with values ranging from 1—“corresponds not at all”, to 7—“corresponds exactly”. The subscales included intrinsic motivation, identified regulation, external regulation and amotivation. Guay et al. report acceptable Cronbach alpha values on each
of the subscales (intrinsic motivation = .93; identified regulation = .81; external regulation = .75; amotivation = .78).

**Results**

Participants included 8 females and 4 males with experience ranging from newly hired to one year from retirement. The data in Table 1 show teachers’ perceived competence at the Delta Conference did not increase significantly. Specifically, intrinsic motivation, or one’s internal desire to do a task for its own sake (Deci, 1971), scores increased slightly from a mean of 5.85 pre-conference to 6.15 post-conference. It appears the experiences at the Delta Conference tended to help teachers internalize their motivation for being there. We did not observe significant changes in teachers’ identified regulation or their perception being at Delta was their own decision. Moreover, we did not observe significant changes in external regulation, which frames teachers’ perceived choice to engage in Delta in order to avoid the negative consequences of not doing so. Teachers at the Delta Conference began the conference with relatively low mean scores for amotivation, which indicates they began the conference expecting a positive outcome.

**Table 1**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre-conference</th>
<th>Post-conference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perceived Competence</strong></td>
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<tr>
<td>Amotivation</td>
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<td>1.35</td>
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</tbody>
</table>

**Conclusions, Implications, and Recommendations**

We can conclude teachers’ motivation for attending the conference was relatively stable despite the conference experience. We believe this gives us some insight on what might motivate teachers to attend the Delta Conference, and perhaps what types of teachers it attracts. Intrinsic motivation increased slightly leading us to posit teachers were already intrinsically motivated before the conference. This appears to differ from other professional development experiences teachers engage in. Additionally, the identified regulation scores help define teachers’ reasons for attending Delta. Though we did not observe significant change pre- to post-conference, we find the high initial score interesting. Teachers at Delta appear to have a high degree of autonomy with regard to their choice to attend. We did not observe significant changes in the perceived competency scale, which may point to several factors. The techniques and strategies used at Delta appear to be new to most participants, and as such, it is possible that the initial competency scores are artificially inflated – teachers do not know what they do not know, a concept often referred to as unconsciously incompetent. This is reflected in the increased post-conference perceived competence range, 3.75-7.00 versus the pre-conference range, 5.00-7.00.
The Oregon Delta Conference seems to attract teachers with high intrinsic motivation. This information is a vital piece in the puzzle of understanding the Delta phenomenon. This data should be compared to the motivation of teachers in other professional development activities – is it the conference or is it the people who chose to attend? To continue this line of research, we recommend examining the following factors: 1) Correlate teachers’ motivation scores to conference evaluation scores to determine if motivation impacts the overall conference experience, and 2) compare teachers’ motivation to their rate of implementation of conference strategies. Additionally, as it is possible the concepts learned at Delta will require time to increase teachers’ perceived competence, requiring a post-post type assessment may help us better examine the conference’s efficacy.

References


Cultivating New Methods for Teaching Middle School Agriscience

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Dawn VanLeeuwen, New Mexico State University

Introduction

It is often suggested that improving science comprehension is critical to improving student achievement. However in analyzing science comprehension, specific program delivery methods are often overlooked. In an innovative approach to teaching and learning, New Mexico State University and the Las Vegas City Schools in New Mexico have developed an educational partnership focused on agriculture, food, and natural resources. The Memorial Middle School Agricultural Extension and Education Center (MMSAEEC) is a youth science center emphasizing inquiry-based learning and experiential education. The mission of the center is to develop a model of teaching and learning excellence that complements in-class instruction by providing context to content. Context is linked to content and enhanced through agriscience and STEM (science, technology, engineering and mathematics) based curricula, activities, and experiments. This research tests whether agriscience programs delivered through a youth agricultural science center contribute to improved science learning for a predominantly Hispanic and economically disadvantaged middle school student population.

Conceptual Framework

Making science education more effective and relevant for a diverse population of young learners is critical to preparing them for future careers (United States Department of Education, 2009 & Weiman, 2008). To ensure this learning is effective, transformative approaches to teaching science are needed (National Research Council, 2007 and 2012). Additionally, reforming science education includes enhancing the experience of youth by engaging them in high quality programs (Skelton and Dormody, 2009). New models should provide students with opportunities to conduct experiments and research using scientific practices (Clarke, 2010). Several secondary education studies found that integrating agriculture with science had beneficial effects on overall test scores for students (Chiasson & Burnett, 2001 and Roegge & Russell, 1990).

A conceptual model by Skelton, Seevers, Dormody & Hodnett (2012) describes how the integration of agriscience into a core curriculum can develop understanding through experiential education and inquiry-based learning enhances science achievement. It depicts a process in which youth transform information into knowledge, develop skills to conduct experiments and research, and acquire the reasoning abilities to explain what they have done, how they did it, and what they can conclude from the experiment. The model emphasizes the importance of the scientific method through the development of experience, asking questions and forming hypotheses, searching for evidence, analyzing and interpreting data, communicating results, and drawing conclusions.
Methodology

Study populations were drawn from two different agriscience programs: a sixth grade plant/soil pH relationship program (N = 116) and an eighth grade plant/water chemistry relationship program (N = 55). The study employed pre and post test program evaluations to measure changes to science knowledge, skill development, reasoning abilities and science comprehension as a result of the program treatment. The researchers developed valid and reliable instruments that reflect content delivered through MMSAECC programs based on New Mexico agriculture, food, and natural resource content and performance standards (Castillo, 2003). Instruments were reviewed by a panel of experts to establish face and content validity. Reliability of the pre and post test program evaluations was established with a test-retest method where instruments were administered at the onset of a program and immediately after program completion. Demographic data and grade level performance data was obtained from the school district. The data were analyzed using a using descriptive statistics and a two factor ANOVA with the factors grade level performance and test score differences. All data were analyzed using SAS version 9.3 software.

Results/Findings

For the plant/soil pH relationship program, 90% of students were Hispanic, 52% male, and 61% performing below-grade level in science. For the plant/water chemistry relationship program, 85% of students were Hispanic, 58% male, and 36% performing below-grade level in science. Significant post test score differences were found for students at grade level in the pH program (p = <0.01), for students below grade level in the pH program (p = <0.01), for students at grade level in the water chemistry program (p = <0.01), and for students below grade level in the water chemistry program (p = <0.01). There were no significant differences found for student grade level performance in either the pH program or the water chemistry program and improvement scores were slightly lower for students performing below grade level in both programs.

Conclusions

Results from this study indicate that, despite grade level performance, student achievement improved in science based on the conceptual model. The researchers had hoped that the model would function in a manner that would provide a learning environment where students below grade level could catch up to students performing at grade level, but this was not the case. However, this does not diminish the significant gains to knowledge, skills, and reasoning abilities that were observed for all groups. Furthermore, the results are consistent with both the need for enhanced learning opportunities and improving minority student achievement scores through non-traditional programs that facilitate career pathways.

Implications/Recommendations/Impact on Profession

This study has important implications for strengthening agriscience programs delivered through agricultural education programs, improving ethnic diversity of students entering post-secondary STEM programs, and improving student achievement for a competitive and knowledgeable workforce. Additional testing of the model is warranted to confirm findings and reanalyzing the data to examine gender differences would add additional richness to the study. Further research
should include a comparison of traditional instruction to the model. Delivering programs that allow students to inquire into subject matter, where content is enhanced through context, facilitates a transformative learning environment. This approach allows students to acquire knowledge, develop a variety of skills, and think critically making programs more effective and education more relevant.

References


Factors that Influence Western Region Collegiate FFA Members’ Decisions to Join

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Rebecca G. Lawver, Utah State University

Introduction

In 2009, the National FFA Organization reported that its membership had reached over half a million members. However, less than 1% of the total national memberships were members from Collegiate FFA (Tatman, 2012). Collegiate FFA programs are offered across the country to students, yet many former members are not taking advantage of the benefits of membership at the post secondary level. There are a number of benefits of membership in the Collegiate FFA program including scholarship opportunities, programs such as the International Collegiate Agricultural Leadership (iCAL) program and the National Collegiate Agricultural Ambassadors program as well as many others through the affiliation with the National FFA Organization (National FFA Organization, 2009). Yet, many of these opportunities are either not well known or sought after (Tatman, 2012). Further, Collegiate FFA at the local level provides and opportunity for students to provide service to others, further enhancing their college experience. Tarpley (2001) asserted that collegiate FFA programs move “from an emphasis of ‘what can the FFA do for me,’ to an emphasis of ‘what can I do for the FFA member’” (p. 22). Collegiate FFA can be a meaningful and positive program for the individual member as well as the National FFA Organization (Tarpley, 2001). In addition, the Collegiate FFA has a strong influence in the recruitment of future students to colleges of agriculture. “Many students responsible for recruiting new undergraduate students to the university were FFA members” (Park & Dyer, 2005, p. 85). The Collegiate FFA provides a leadership development organization for students in agriculture while continuing to support the National and local FFA organization. According to the Kellogg Commission on the Future of Land Grant Universities (1997), student organizations are essential programs that provide invaluable lessons for the students and contribute to the overall collegiate experience. Extracurricular experiences that college students partake in greatly contribute to leadership development and workplace necessary skills (Kuh, 1995). Studies have indicated that participation in FFA enhances leadership abilities (Park & Dyer, 2005) therefore participation in the Collegiate FFA would broaden and enhance those skills. There must be a leadership development program in agricultural colleges (Schumacher & Swan, 1993) and the Collegiate FFA fits the criteria for such a program (Park & Dyer, 2005). Those who do not participate in the Collegiate FFA are passing on a chance to gain potential life and leadership skills.

Purpose and Objectives

The purpose of this research was to describe the factors that influence former high school FFA members’ decision to join Collegiate FFA. The following objectives for the study were:

1. Describe students’ prior involvement with the FFA Organization.
2. Describe students’ knowledge about the Collegiate FFA organization on their campus.
3. Determine the factors that influence students’ choice to join Collegiate FFA.
Theoretical Framework

Astin's (1984) theory of involvement suggests students who are involved in both the social and academic aspect of the collegiate experience learn more. Students who are involved dedicate energy to academics, spend time on campus, participate actively in student organizations and activities, and interact often with faculty (Austin, 1984). While, uninvolved students neglect their studies, spend little time on campus, abstain from extracurricular activities, and rarely initiate contact with faculty or other students (Astin, 1984).

Methodology

The target population for this study consisted of current Collegiate FFA members ($N = 205$) that were attending seven Intermountain West Land Grant Institutions. With a response rate of $44\%$ ($n = 90$). The researcher-designed questionnaire served as the data collection instrument for the study and was administered through an online survey response system (survey.monkey.com). A panel of experts was utilized to review the instrument for face, construct and content validity. A pilot test was conducted with similar students ($n = 31$) and a Cronbachs’ alpha of .84 for perceptions of high school FFA and .94 perceptions of Collegiate FFA was reported to provide an estimate of internal consistency to establish reliability. Data were collected.

Findings

Objective one was to describe students’ prior FFA involvement. Out of the 90 respondents, 14 (16.7%) respondents were involved in middle school FFA and 88 (96.7%) reported they were involved with high school FFA. The majority of participants ($n = 83$, 92%) indicated they had been involved in FFA for more than four years. Objective two sought to describe students’ knowledge of the Collegiate FFA. Respondents who heard about Collegiate FFA before first semester of college were $64.4\%$ ($n = 57$); second semester included $31.3\%$ ($n = 28$), with the remainder hearing of Collegiate FFA after third semester of initial enrollment. The majority of students’ reported hearing about Collegiate FFA through a friend or acquaintance ($n = 53$, 58.9%). Objective three sought to determine the factors that influenced students’ choice to join Collegiate FFA. Students reported prior FFA involvement was the greatest influence (77%), as well as development of life skills (30%), followed by networking (23%).

Conclusion/Recommendations

This study identified that current Collegiate FFA members in the Intermountain West typically come from very strong FFA backgrounds. They were involved in high school; many had obtained their State FFA Degree, attended conventions, were elected to offices, and participated in events. Collegiate FFA chapters across the Intermountain West should capitalize on the population of high school members in their states to recruit as future Collegiate FFA members on their campus. National FFA as well as local Collegiate FFA Chapters should continue to develop promotional materials, and networking opportunities to assist students in finding Collegiate FFA Chapters as many were aware of the opportunity prior to coming to campus. The opportunity to be involved in campus leadership and develop life skills and networking were the factors identified as most influential for these students. Collegiate FFA Chapters in the Intermountain West should focus on these areas as they make plans for their year. This may help with
recruitment of new members as well as retain current members interest. As a means for continued professional growth of college students, agriculture teacher educators, National, State and local FFA should create opportunities to assist in the recruitment process by offering workshops about Collegiate FFA and promote the opportunities that students can continue to have as they proceed to higher education.

References


Impact of Influential People and Timing of the College Decision-Making Process

Steven J. Rocca, California State University, Fresno
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Introduction

Nationwide colleges of agriculture have struggled to meet the need for qualified graduates to fill jobs in the food, renewable energy, and environmental industry sectors. Many institutions are still uncertain about which outreach and recruitment processes are effective (DesJardins, Dunbar, and Hendel, 1999). In some cases, administrators have begun to question the value of outreach activities that have traditionally been sponsored and coordinated by colleges of agriculture. Typically the decision to conduct such activities is based on tradition rather than empirical evidence. Acknowledging that a student’s college-choice strongly influences his or her professional career (Hossler and Stage, 1992), colleges of agriculture should evaluate strategies to effectively attract students in an effort to continue producing the future professionals needed by the industries they serve.

Chapman’s (1981) model of student college-choice served as the theoretical basis for this study. Chapman’s model suggests that significant persons such as parents, friends, role models, and school personnel influence students' perceptions of a college. Adapted to this study, Chapman’s model would suggest that gaining a better understanding of the role of influential people along with the timing of students’ college decisions would enable colleges of agriculture to more efficiently use their recruiting resources by targeting those influential people and by conducting outreach activities during the most critical times in the decision making process.

The purpose of this study was to examine the college decision making process of students entering a college of agriculture in hopes of identifying the most influential people and the time that those decisions are typically made. The following research objectives guided this study:

1) Determine the most influential people on undergraduate agriculture students’ college decision-making process.
2) Determine when undergraduate agriculture students’ begin and finalize their college choice.

Methodology

The target population for this descriptive study included all incoming undergraduate students entering the Jordan College of Agricultural Sciences and Technology at California State University, Fresno during the fall 2013 (N = 460). A modified version of the Washburn, Garton, and Vaughn (2002) questionnaire was used to assess the influence of various people and to examine when students began and finalized their college decisions. The instrument was reviewed by a panel of experts to establish face and content validity. A pilot test (n = 34) was conducted to determine the internal consistency of the instrument (Washburn et al., 2002). A Spearman-Brown Split-half reliability analysis was performed resulting in a reliability of .70.
An online questionnaire consisting of 74 items was administered through email requests sent to students in the population. The initial email request directing students to the questionnaire was followed by two additional reminders sent at two-week intervals. A comparison of non-respondents to respondents was conducted on student information obtained a priori to control for non-response error (Linder, Murphy, & Briers, 2001; Miller & Smith, 1983). The comparison of grade point average, race, and selected major yielded no notable differences.

Results

Completed instruments were received from 170 of the 460 students in the population for a response rate of 36.9%. Respondents were 67% female and 57% entered the university as freshman, while the remaining 43% were community college transfers.

In regards to the most influential people on students’ college decision-making process, the results show that parent or guardian had the greatest influence \((M = 3.53)\) on a 1 to 5 Likert-type scale. Parents were followed by high school agriculture teacher \((M = 3.15)\), relative who attend the university \((M = 3.10)\), friend who attends the college \((M = 3.09)\), and college of agriculture faculty/staff \((M = 2.91)\). The people who had the least influence on students’ college choice were their high school science teachers \((M = 2.04)\), community college counselors \((M = 2.38)\), other high school teachers \((M = 2.49)\), friends from high school \((M = 2.53)\), and graduates of the college of agriculture \((M = 2.55)\).

This study also sought answers to the question of when do students begin and finalize their college decision-making process. Results show that 21% of the respondents began this process before 9th grade, 19% during 9th grade, 16% during 10th grade, 25% during 11th grade, 9.5% during their senior year, and 9.5% after high school. When asked about the finalization of their decision, none of the respondents made their decision before the 9th grade, 1.6% decided during 9th grade, 1.6% during 10th grade, 6.3% during 11th grade, 49.2% during 12th grade, and 41.3% made their final decision during community college.

Conclusions

The strong influence of parents and guardians in the college choice process is well documented in the literature (Broeckemier & Seshadri, 1999; Rosato, 1993; Hossler & Stage, 1992). This study was no different, with parent or guardian being the highest rank. It is also interesting to note that high school agriculture teacher was the second most influential. This is especially notable when you consider that the high school science teacher and other high school teachers were near the bottom of the list. These findings support the need to target parents and high agriculture teachers when recruiting students. The university should make every effort to not only interact with students, but also these influential people as they have an important role in the decision-making process. This also lends support for continued relationship building with agricultural education alums as their perceptions of the university will surely be communicated to their high school students whether it is positive or negative.

When examining the timing of the college decision-making process it appears that the freshman year is a crucial time for outreach efforts as 40% of the respondents began their decision process by their freshman year in high school. Even more important, targeting students during their
senior year, as nearly half (49.2%) of the respondents made their decision to attend the university during that year. These findings should help guide outreach staff as they schedule their activities and school visits. Attention should be paid to providing freshman with the information needed to begin making an informed decision, while seniors should be provided with relevant information and support that will assist them in making their decision final.

References


Information Sources and Institutional Characteristics Impacting Minority Student Recruitment into a College of Agriculture

Steven J. Rocca, California State University, Fresno
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Introduction

Even with the current trend of increasing enrollment, colleges of agriculture are estimated to provide only 54% of the workforce needed to fill the expected job openings between 2010 and 2015 (Goeker, Smith, Smith, and Goetz, 2010). To help meet the need for more qualified graduates, colleges of agriculture commit a great deal of time, energy, and financial resources to their outreach and recruitment programs (Washburn, Garton, and Vaughn, 2002). This has created a situation in which university administrators are looking to increase and improve recruitment efforts. An area that holds potential for increased enrollment is in the recruitment of minority students, especially at Hispanic Serving Institutions (HSI). Historically, recruiting minority students into agricultural programs has been a challenge due to the negative stigma associated with agriculture and the misconception that it only offers jobs as farm laborers (Nichols & Nelson, 1993).

The purpose of this study was to examine recruitment efforts as they affect the decision-making processes of minority and non-minority students entering California State University, Fresno. The following research objectives guided this study:

1. Determine if a difference existed between minority and non-minority students in terms of their use of information sources and their perceived usefulness of those sources

2. Determine if a difference existed between minority and non-minority students in terms of the influence of institutional characteristics.

Methodology

The target population for this descriptive census study consisted of all the new undergraduate matriculants entering the Jordan College of Agricultural Sciences and Technology at California State University, Fresno for the fall semester 2013 (N = 460). The population was divided for comparison based on those students who reported their ethnicity as Caucasian (n = 103) and those students that reported being a minority [(n = 67) Hispanic = 51, Asian = 9, African-American = 5 and other = 1].

A modified version of Washburn, Garton, and Vaughn’s (2002) questionnaire was used to assess the use and usefulness of recruitment information sources and to examine the influence of various institutional characteristics. The instrument was previously reviewed by an expert panel to ensure face and content validity and a pilot test (n = 34) was conducted to determine the internal consistency of the instrument (Washburn et al., 2002). A Spearman-Brown Split-half reliability analysis was performed resulting in a reliability of .70 (coefficient alpha).
For this study, the questionnaire consisting of 74 items was administered online and participation was requested via email to all students in the population. After the initial email request directing students to the questionnaire URL, two additional follow-up email messages were sent at two-week intervals. Non-response error was controlled by comparing non-respondents to respondents on student information obtained a priori (Linder, Murphy, & Briers, 2001; Miller & Smith, 1983). No notable differences were found from a comparison of grade point average, race, and selected major.

**Results**

A total of 170 usable instruments were received, resulting in a response rate of 36.9%. Of the 170 respondents, 103 reported their ethnicity as Caucasian, while 67 reported being a minority (Hispanic = 51, Asian = 9, African-American = 5, and other = 1). The gender of respondents was 70% minority females compared to 67% Caucasian females.

The first research objective sought to examine differences in the use of information and the perceived usefulness of those information sources. Results indicated that 98% of the Caucasian students and 96% of the minority students felt that they received enough information to make an informed decision to attend the university. Caucasian students reported that university information on the web, visits to campus, degree program information on the web, printed university publications, and college of agriculture information on the web were the most frequently used information sources. Minority students indicated that visits to campus, university information on the web, degree program information on the web, personal conservations with faculty and printed university publications to be their most used sources. When asked about the most useful sources, both groups felt visits to campus were their top choice followed by participation in recruitment events and other student events on campus, such as FFA field days. Minority students did indicate that a personal conservation with a professor was their third most useful information source as compared to Caucasian students who ranked it sixth.

For objective two, examining the influence of institutional characteristics found that both groups were most interested in the job opportunities afforded to them after graduation. Minority students followed that with consideration of the distance of the university from home, quality and reputation of faculty, variety of majors offered, and the university’s academic reputation. Caucasian students differed, as they were concerned with the variety of majors offered, cost of tuition/rent, preparation for employment and quality of the academic facilities.

**Conclusions**

This study sought to determine if differences existed between Caucasian and minority students. Results did show a few differences, however the notable conclusions to be drawn here are the similarities of the two groups. Both groups indicated a strong preference for gathering information during a visit to the university campus through events like open house or FFA Field Days. These findings lend support to the college-choice literature, which consistently states the important role of campus visits (Cunningham and Fickes, 2000; Walters, 1997). Both groups also found the university and the college’s website to be important sources of information. Based on these findings, the university and college should continue to support and expand upon its
opportunities to get students to visit campus for outreach events. Simultaneously, they should continue efforts to provide timely, accurate, and user friendly websites as they provide both groups of students with essential information. During these events and on the web, attention should be paid to promoting the institutional characteristics on the mind of most potential students. Both student groups want to hear about the opportunities for them after graduation, so marketing messages should be developed accordingly. Profiles of students with interesting internships, stories about successful graduates, as well as graduate follow-up and placement data should all be considered for recruitment publications and clearly posted on websites.

References


Is Leadership the Missing Link? Exploring Agriculture Teachers’ Self-Efficacy in Leadership

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Josh Stewart, Oregon State University

Introduction

When an individual assumes the role of a teacher, they also assume the role of a leader (Bowen, 2004; Gunter, McGregor, & Gunter, 2001; Lieberman & Miller, 2005). In agricultural education, this teacher as leader role is even more pronounced, as agricultural educators teach, model, and practice leadership skills (Morgan, Fuhrman, King, Flanders, & Rudd, 2013). However, a dearth of research exists exploring the relationship between agriculture teachers’ leadership and other important teaching characteristics. Although research in agricultural education has no explored this relationship, research conducted outside of agricultural education offers insight into the importance of leadership within schools. Ross and Gray (2006) found the level of leadership within a school was related to higher collective teacher efficacy, greater teacher commitment to school mission, school community, school-community partnership, and student achievement.

The purpose of this research was to explore the relationship between leadership and other teaching characteristics among early career agricultural educators. More specifically, the objective of this study was to examine the relationship between agriculture teachers’ self-efficacy in leadership and their self-efficacy in classroom management and instructional strategies. Exploring these relationships may provide valuable information into teachers’ leadership characteristics and how they relate to the construction of a supportive learning environment for students (Doerfert, 2011).

Conceptual Framework

The conceptual framework used in this study paired the theory of self-efficacy (Bandura, 1986) and the relationship between leadership skills and teaching agricultural education (Morgan et al., 2013). The term self-efficacy refers to an individual’s confidence in their abilities to accomplish a given task. Furthermore, the theory of self-efficacy identifies that increased levels of self-efficacy are related to success within a given task. Pairing the concepts of self-efficacy with the notion of agriculture teachers as leaders (Morgan et al., 2013), we posit that an agriculture teacher’s self-efficacy in leadership will be related to their ability to teach in and manage an agricultural education classroom.

Methodology

This population for this study included all first through fifth year agricultural education teachers in California, Idaho, Oregon, Utah, and Washington (N = 295) during the 2012-2013 school year. This research is part of a larger study addressing first through fifth year agriculture teachers. A census of all teachers in the population was attempted. A total of 150 usable questionnaires were returned, yielding a useable response rate of 51%. We treated the responding teachers as a non-
random sample of teachers (n = 150) within the population frame. A non-response check, comparing on-time to late respondents using an independent samples t-test, was run (Lindner, Murphy, & Briers, 2001; Miller & Smith, 1983). On-time and late respondents were statistically similar in their leadership self-efficacy, classroom management self-efficacy, and instructional strategies self-efficacy.

Existing instruments were used to measure respondents’ self-efficacy in leadership (Individual Leadership Factors Inventory; Velez et al., 2012), classroom management, and instructional strategies (Teacher’s Sense of Self-Efficacy Scale; Tschanne-Moran & Woolfolk Hoy, 2001). Items on these constructs were measured on six-point scales ranging from 1 “Strong Disagree” to 6 “Strongly Agree.” The three constructs were pilot tested with first through fifth year agricultural education teachers in a Midwestern state, and found to be reliable at the 0.70 level (Cronbach’s Alphas = leadership self-efficacy 0.95; classroom management self-efficacy 0.93; and instructional strategies efficacy 0.83). We used Pearson’s product moment correlations (r) to measure the relationships between agriculture teachers’ self-efficacy in leadership, classroom management and instructional strategies. Because we treated responding teachers as a sample of the population, inferential statistics were used. The significance level used in this study was set a priori at α < .05. Furthermore, effect sizes were used in this study, and set at small effect, r = .10; medium effect r = .30; and large effect, r = .50.

Results/Findings

Respondents perceived similar levels of self-efficacy in leadership (x̅ = 4.80), classroom management (x̅ = 5.02), and instructional strategies (x̅ = 4.90). A large, positive relationship was found between responding agriculture teachers’ leadership self-efficacy and classroom management self-efficacy (see Table 1). Likewise, a large, positive relationship was found between teachers’ leadership self-efficacy and instructional strategies self-efficacy.

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</table>

Conclusions/ Implications/ Recommendations

This exploratory study sought to provide the agricultural education discipline with information regarding the relationship between teachers’ leadership self-efficacy and self-efficacy in classroom management and instructional strategies. This study found a significant, positive relationship between the variables of interest. These findings support our conceptual framework linking agricultural education teachers’ perceived leadership abilities with their perceived abilities in classroom management and instructional strategies. Additionally, this research provides evidence warranting further exploration of agriculture teachers’ leadership abilities. Specifically, we recommend research exploring the relationship between agriculture teachers’
leadership self-efficacy and their ability to engage students in the agricultural education classroom.

References


Pinteresting Teamwork:

A Content Analysis of an Agricultural Communications Group Pinterest Board

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Erica Irlbeck, Texas Tech University

Introduction/Need for Research

Priority Area 2 of the National Research Agenda states that social science research goals should address “the use of new technologies and social networking tools for communication to selected target audiences” (Doerfert, 2011, p. 17). Since its launch in 2010, Pinterest has quickly gained popularity becoming one of the fastest growing social networks to date and is currently the fastest growing online content-sharing platform (Delo, 2012; Griswold, 2013; Merrett, 2013; Romeri, 2013). Duggan and Brenner (2013) found that 15% of American Internet users are now on Pinterest. The increasing popularity of Pinterest makes it important that agricultural communicators find ways to utilize Pinterest in a variety of ways. Additionally, with many companies and organizations now utilizing social media and employing social media directors, Kupetz (2010) suggested that instructors need to incorporate social media in the classroom in order to prepare students for life in the real-world. Group boards allow multiple pinners with a shared interest to pin content to a common board. An agricultural communications group Pinterest board was developed at [University] as a means of sharing relevant resources with faculty and students; however, no evaluation of this board and its content had been conducted. To better understand and improve upon the use of this Pinterest board, an analysis was conducted of content pinned to the group board.

Conceptual Framework

Rhoades, Friedel and Irani (2008) surveyed students to identify their feelings about new technology in the classroom. They found students’ top three preferences of technologies were the Internet, email, and Facebook. In addition, they found faculty who used new technology were more likely to focus on real-world tasks and examples. Baird & Fisher (2005) believed that to be successful in using social media in the classroom students must be able to make connections between the learning objectives and the Web-based media content. Additionally, they concluded that “students expect interactive, engaging content and course material that motivates them to learn through challenging pedagogy, conceptual review, and learning style adaptation” (Baird & Fisher, 2005, p. 24).

Methodology

Researchers utilized a qualitative content analysis design to determine what content was being pinned to the group Pinterest board at [University]. All pins from this board, 170 in total, were included in the sample of this study conducted in late October 2013. During the analysis, pins were categorized and coded based on the content they contained. Data were recorded on a Microsoft Office Excel spreadsheet where researchers recorded each category represented as well as the number of pins within each category. Categories were refined and reduced using open
and axial coding methods until a final set of pin categories were developed. Totals were figured for each category and percentages were calculated based upon those figures. The data were collected by only one researcher to ensure consistent coding was conducted for all pins.

**Results**

The researchers found that seven pinners contributed pins to the group board, all of which were focused in agricultural communications and consisted of three Ph.D. students, two master’s students, one undergraduate student, and one assistant professor. The group board contained 170 pins which were categorized by researchers into 12 distinct categories. The largest group of pins, 28% \((n = 49)\), were found to contain content related to social media. These pins ranged from tips on social media use to resources for social media content to guides for developing a social media plan. Other major categories included classroom resources and ideas \((n = 17, 10\%)\), design inspiration and tips \((n = 17, 10\%)\), job application advice and job skills \((n = 15, 8.8\%)\), technology \((n = 13, 7.6\%)\), and agricultural facts and information \((n = 12, 7.1\%)\). Table 1 shows a summary of all content found on the group board. At the time of this analysis, the board had 350 followers, most of which were agricultural communications students at [University].

### Table 1

**Content Analysis of [University] Agricultural Communications Group Pinterest Board**

<table>
<thead>
<tr>
<th>Categories of Pin Content</th>
<th>Number of Pins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Media Resources and Tips</td>
<td>49</td>
</tr>
<tr>
<td>Classroom Resources and Ideas</td>
<td>17</td>
</tr>
<tr>
<td>Design Inspiration and Tips</td>
<td>17</td>
</tr>
<tr>
<td>Job Application and/or Skills</td>
<td>15</td>
</tr>
<tr>
<td>Technology</td>
<td>13</td>
</tr>
<tr>
<td>Agricultural Facts and Information</td>
<td>12</td>
</tr>
<tr>
<td>Color</td>
<td>10</td>
</tr>
<tr>
<td>Adobe Creative Suite Tutorials and Shortcuts</td>
<td>8</td>
</tr>
<tr>
<td>Fonts</td>
<td>8</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>8</td>
</tr>
<tr>
<td>Writing Tips and Resources</td>
<td>7</td>
</tr>
<tr>
<td>Marketing</td>
<td>6</td>
</tr>
</tbody>
</table>

*Note. The group board analyzed contained 170 pins from s different pinners as of October 2013.*

**Conclusions**

This study sought to determine what content was being pinned to a group agricultural communications Pinterest board at [University]. The results of this study allowed the researchers to better understand how the Pinterest board was being utilized by faculty and students within the department so improvements could be made in providing relevant and useful information to followers of the group board. As suggested by Baird and Fisher (2005), the use of social media tools can result in more effective and engaging content being delivered to today’s students. Pinterest offers a unique way to disseminate relevant content to a large number of agricultural communications students and faculty.
Recommendations

Based on the results of this study, the researchers suggest an expanded agricultural communications Pinterest account be created rather than one single board. Having an account with multiple boards will allow the multiple categories of information found in the study to be organized into related boards, allowing for a more organized and more user-friendly interface. The researchers also suggest that other agricultural communications programs across the country utilize a group Pinterest account as a means of disseminating relevant content to their students and faculty. The visual nature of Pinterest makes it an easy to use and easy to view forum for providing additional information to students and faculty alike.

References


Teacher Skills and Knowledge Professional Development Needs of Beginning Teachers in Idaho

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Introduction/Need for Research

A continuing shortage of agricultural education instructors has been evident across the nation, and specifically within the state of Idaho. In the past 2 years, there has been a 36% change in secondary agricultural education instructor positions within the state ("2014 Initiative for Secondary Agricultural Education Improvement," 2014). All of these new instructors face challenges related to teacher skills and knowledge. As a result, beginning teachers are in need of professional development coursework to prepare and retain their teaching positions (Ruhland & Bremer, 2002). Nationally, research has been conducted regarding beginning teacher challenges for over three decades (Joerger, 2002; Joerger & Boettcher, 2000; Miller & Scheid, 1984; Mundt & Connors, 1999; Nesbitt & Mundt, 1993; Rayfield, McKim, Lawrence, & Stair, 2014; Stair, Warner, & Moore, 2012) and the need for professional development to address those transitional, induction, and mentorship needs. Identifying the professional development needs of beginning teachers as perceived by beginning teachers, veteran teachers and building administrators will give a direction to professional development activities offered at the district and state level and aligns directly with the AAAE National Research Agenda (Doerfert, 2011) priority area 4 – Meaningful, Engaged Learning in All Environments and priority area 5 – Efficient and Effective Agricultural Education Programs. Assessment of the needs of beginning teachers should be conducted on a regular basis (Joerger, 2002) and that information should be used to design professional development programs within the state was conducted in the late 1990s (Mundt & Connors, 1999) and so the need for new information is critical for effective teacher preparation and retention programs. This study sought to specifically identify the teacher knowledge and skills challenges faced by Idaho beginning agricultural education instructors to provide the professional development and mentoring support needed to retain teachers in the secondary classroom.

Theoretical Framework

The theoretical framework for this study is couched in the Herzberg’s Motivational-Hygiene Theory (McClelland, 2014). Herzberg’s hygiene factors address the work and organizational environment and include the organization and its policies, supervision, work conditions, interpersonal relationships, salary, status, and job security. First year teachers experience high levels of stress in the first 7 to 8 weeks of classroom instruction (Joerger & Boettcher, 2000), primarily as they adjust to hygiene factors in their positions. If beginning teachers are not well equipped to deal with hygiene factors, these challenges could facilitate a negative experience in the classroom and thereby encourage attrition from the profession.

Methodology

The Delphi technique is designed as a group communication process which “aims to achieve convergence of opinion on a specific real-world issue” (Hsu & Sandford, 2007) and can be used
to seek out information which may “generate a consensus on the part of the respondent group” (Delbecq, Van de Ven, & Gustafson, 1975). The Delphi process was used in the study and modeled after the process described by Hsu & Sandford (2007) to gain consensus on the challenges facing beginning agricultural education instructors. The three groups surveyed were:

1. Beginning agricultural education instructors (0-5 years of experience),
2. Veteran agricultural education instructors (6+ years of experience), and
3. Building administrators.

In the initial round of the survey, 124 secondary agricultural education instructors and 57 secondary principals with viable email addresses were invited to participate in the study, including all secondary agricultural education instructors in the state as well as building level administrators from schools which offered agricultural education programs ("Mailing List and Educational Directory,” 2014). Reliability of a Delphi study was greater than .80 when the group size was larger than 13 (Dalkey, 1969; Dalkey & Rourke, 1972). In Round 2, respondents were asked to rate item related to teacher skills and knowledge to establish preliminary priorities (Hsu & Sandford, 2007) on a 5 point Likert-type scale (1=Strongly Disagree; 2=Disagree; 3=Uncertain; 4=Agree; 5=Strongly Agree). A 2/3 agreement rate with the statements was identified a priori for items to advance to the final round (Myers et al., 2005) when consensus is generally reached (Hsu & Sandford, 2007).

Results/Findings

Because a census population was used, the findings may be limited to the population of this study. The overall response rate for both Rounds 1 and 2 was 60% and Round 3 was 88%. Round 1 asked the respondents to identify challenges facing beginning teachers and identified 16 items related to Teacher Skills and Knowledge. In Round 2, the respondents rated each of the items from Round 1 on a Likert-type scale (1=Strongly Disagree) to 5 (Strongly Agree). The items of highest concern was the amount of classroom experience (86%) held by new teachers followed closely by the classroom management skills of beginning teachers (83%) and the volume of work expected from beginning teachers (79%). In Round 3, participants were asked to indicate if they agreed or disagreed with each of the final 7 statements. Again, a 2/3 (66.6%) agreement rate was set a priori to establish consensus (Myers et al., 2005). All 7 of the final items exceeded the consensus level. Volume of Work was the item of highest concern (n=82, 90.11%) supporting Mundt & Connors (1999) followed closely by Classroom Management Skills (n=81, 89.01%) supporting Cannon, Kitchel & Duncan (2012), Garton & Chung (1996), Joerger (2002), and Nesbitt & Mundt (1993) and Classroom Teaching Experience (n=81, 89.01%).

Conclusions

By establishing consensus upon challenges facing beginning agricultural education instructors, Team Ag Ed can work toward developing appropriate professional development and mentoring activities to assist in preparing new teachers for successful transition into the classroom. Attaining successful transition can also contribute to secondary teacher retention.
References


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An Analysis of Successful eLearning:
Elements Impacting the Delivery of Online Courses for Continuing Education

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Introduction and Theoretical Framework

eLearning, also referred to as online learning, has continued to evolve and become a part of many educational and training endeavors across academia. Roberts and Dyer (2005) reported that academic use of distance education technology has become commonplace across agricultural education. Campbell, Koszewski, and Behrends (2013) found that behaviors related to nutrition could be improved using training delivered via distance education and businesses related to the wood industry indicated willingness to participate in online education (Quesada-Pineda, Conn, & Sanchez, 2011). Furthermore, many agricultural organizations have been reported as utilizing technology-based training in some form (Bedgood, Murphrey, & Dooley, 2008). While studies have been conducted related to student perceptions of the use of technology for teaching (Kelsey, Lindner, & Dooley, 2002) and the use of elearning with professionals (Thomas, Davis, & Moss, 2008), only limited research has been conducted regarding best practices within the setting of continuing education.

It is recognized that the success of eLearning varies depending on how one defines success. Thus, the theoretical framework for this study utilized the information systems model: DeLone and McLean Information System Success Model (2003). This model includes six areas: information quality, system quality, service quality, intention to use, user satisfaction, and net benefits (DeLone & McLean, 2003).

Purpose and Methodology

The purpose of this study was to identify common elements across successful eLearning courses administered via Extension. A case study methodology was employed. eLearning courses that were deemed to be successful based on criteria identified through the literature and confirmed with a panel of experts were analyzed based on type, purpose, audience, and materials. Four courses were analyzed with each case being selected because it represented a variety of delivery modes and content. Courses were selected based on an analysis report involving the number of hits/views and the number of enrolled users. From that report we gathered a list of the top four courses based the following reasoning: Course A - Highest number of users above any other course on the site with an enrollment of 4,950; Course B - High number of views and 380 enrolled users; Course C- High number of views (39 enrolled during analysis) and has now been sectioned off into corresponding courses due to popularity; and Course D- 479 enrolled users and high number of views.

Results and Conclusions

A detailed review of each course revealed specific common elements that were present in all cases: a specific audience was identified, the need for the course was clearly articulated,
multiple modalities of delivery were provided, and a high level of learner engagement existed. An element that was also found to have an impact was audience motivation. In our research we found for each of the courses that were deemed to be successful the course dealt with compliance training or personal growth. The presence of an intrinsic or extrinsic motivation in the audience proved to promote course success. An examination of the courses revealed that two of the courses were self-directed and two were facilitated by an instructor. This proved that although facilitation is beneficial it does not determine success as defined by this study. Elements that were not found to be present in all cases included the design or look of the course or whether or not there was a participation fee associated with the course.

Detailed analysis of each course provides insight regarding elements that impact the success of utilizing eLearning for continuing education. While differences do exist between compliance training and personal growth courses, it is important to note that participants of continuing education courses often have a choice of what training they complete for compliance and for personal growth. Clear identification of the audience and aspects to meet audience need were present in all four courses. Further, course content included interactive videos, discussion, and pictures along with a sense of instructor presence.

**Conclusions**

As we continue to seek new and innovative ways to serve students and professionals, recognition of the elements that can determine success is critical in order to avoid wasted effort. As noted by DeLone and McLean (2003), user satisfaction and the intention to use a system are directly impacted by information quality, system quality, and service quality. When creating online learning it is crucial that developers and instructors create a course with the intention to gain an audience and not lose an audience. The purpose of this research was to identify components in online learning that will assist course developers and instructors to successfully gain an online audience. It is critical that we ensure the best delivery of that online learning experience for each participant in a course. It is our hope that from the research and findings we can provide a guide to successful online course delivery. Having an existing audience, well developed content and materials, high level of learner engagement and either an intrinsic or extrinsic motivation factor present in the course is critical for online course success.

**Implications and Recommendations**

Tremendous opportunities exist for academic programs to expand reach through involvement in providing continuing education opportunities. This reach could provide an avenue for student recruitment, community engagement, and financial gain. As academic units within agricultural education seek to provide continuing education it is critical to create courses and programs with the most potential for success. Findings from this study provide useful guidance to ensure that time and funds spent developing and delivering eLearning result in a higher chance of success. It is recommended that further research be conducted regarding this topic by conducting interviews with individuals directly involved in the creation and delivery of the courses studied in order to gain a deeper understanding of practices that lead to successful delivery of eLearning.
References


Agricultural Education Instructor Trading Cards

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Allison Touchstone, University of Idaho

Introduction/Need for Innovation

The Teach Ag workshop was created for an opportunity to get the attention of students who are interested in entering agricultural education at the post-secondary level. There is a teacher shortage when it comes to agricultural education. Jobs are available without universities producing enough teachers to fill the positions. Idaho has experienced a 36% turnover rate in agricultural educators in the past 2 years ("2014 Initiative for Secondary Agricultural Education Improvement," 2014). A variety of volunteers speak about their experiences during the workshop to give students an insight on teaching. The workshop is held each year at the State Leadership Conference for the FFA. The activity added to the workshop by allowing students to introduce themselves to more agricultural education instructors.

There has been changes in positions, graduation rates, and vacancies. An activity was used for recruitment and retention to keep things in balance. Agricultural Education Instructor Trading Cards is an activity that took place at the Idaho FFA Leadership Conference in April, 2014. The purpose of the activity was to target FFA members interested in agricultural education. Having them introduce themselves to a variety of 19 pre-chosen agricultural educators throughout the state, will show high school FFA members that agricultural educators in Idaho are not the same in how they teach. The curiosity came from being interested in finding new ways to recruit new potential agricultural educators, keep those interested engaged and begin establishing a network of contacts in the profession. The trading card project directly aligned with Priority Area 3 – Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century from the National Research Agenda of the American Association for Agricultural Education (Doerfert, 2011).

How It Works

For the activity, 19 different agricultural educators were selected from the 120 teaching in the state, with representation from each of the 9 FFA districts. The “Teach Ag Stars” for the trading cards were chosen from chapter advisors and teacher educators at the state land grant institution. This activity was completed through a class entitled Communicating in Agriculture by an undergraduate student who showed interest in how to recruit more agricultural educators.

Teachers were given their pack of trading cards inside the registration packet for their Idaho FFA chapter. The cards included a picture of the selected educators on the front with their name in a banner. On the back, the Teach AG logo was used in the top left corner including their name in the center with the district they are from. Biography information was used to make the game more interesting and more personal for the students. The information contained was highest college degree received, where they graduated from college, how many years they have been teaching, where they teach agricultural education, where they are originally from, an interesting
fact about themselves, and an inspirational quote from FFA, inside the classroom, or in general. Few interesting facts were, “I rocked a mullet in high school”, “I have jumped out of a plane”, and “I have ridden a bike over 5,000 miles”. An entertaining quote that was provided was, “A sasquatch won’t attack you if you become an FFA member”. These pieces of information were included to help students remember different educators more easily when collecting cards

The game was introduced at the Teach Ag workshop on Thursday afternoon during the FFA State Leadership Conference. FFA members who are interested in agricultural education attend the workshop. Experienced high school agricultural education instructors, new high school agricultural education instructors, and university professors come prepared to talk to the FFA members. They share their experiences and some advice they have learned to excite the potential agricultural educators. The students were given small plastic boxes to hold the cards they collected making it more convenient for students to hold cards inside their official dress. The boxes included the rules and three trading cards as a starter pack because the teachers are notoriously difficult to find during the FFA State Leadership Conference.

Fifty copies of each card were printed on cardstock along with fifty copies of the rules for students and advisors that would be participating. The prizes for the participating students included buttons that could be displayed on their FFA jackets. The buttons were all different, and included quotes to catch the attention of the participants: “Only blue will do”, “Rock your ag swag”, “You miss 100% of the shots you don’t take”, and “Tuck in you tallywacker”. There were five different buttons made with a total of 150 buttons made for students. The 19 teachers who participated in the game were given a red button saying, “[Student Name] thinks I’m awesome” to get the attention of other teachers for more participation next year.

**Results to Date**

During the conference, having the 19 agricultural educators wear the buttons got the attention of other students sparking interest. This being the first year hosting the game, teachers became involved and students more outgoing. However, more students wanted to be involved that did not attend the Teach Ag workshop. Only 5 students collected their buttons from playing the game. However, more students who did not participate indicated they are interested to play next year.

**Future Plans**

Including more students and agricultural educators next year may improve the game. Educators were excited and interested in continuing their participation in future years. The goal is to eventually get all agricultural educators to play and increase to probability of students to continue into agricultural education and provide them with professional connections in the profession. The prizes worked as a great encouragement to have students play the game, and future years would require a greater number of prizes.

**Costs/Resources Needed**

The cost of printing the trading cards from the university printing center was approximately $200.00. The boxes for the students were ordered from Amazon costing $94.40. The button maker and supplies were replenished costing $50.00. The publication with the Idaho FFA
Leadership Conference consisted of participating in the Teach Ag workshop by presenting the activity to students. Having 19 agricultural education instructors with approximately 30 students participate were also resources needed to make the activity more affective.

**References**


Identification Set Management Program

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Introduction

Identification of tools and materials has always been an integral part of agricultural instruction. Examples can be found in state curriculums in a variety of subjects such as agricultural mechanics and horticulture (California Department of Education, 2014). Identification sections are commonly found in career development events (CDE) at the state and/or national levels (California Agricultural Teachers' Association, 2014) (FFA, 2014). Events as diverse as floriculture, veterinary science, agricultural mechanics, and meats all have identification components. Two innovations in technology have made developing identification sets much easier: Digital cameras have provided a quick and easy means of collecting images and high quality digital images are commonly available on the Internet. Instructors have used these images to build a variety of teaching aids such as PowerPoint presentations, handouts, and tests. The common use by students of smart phones and tablet computers provide opportunities for students to drill on identification sets if they are prepared in suitable formats. The MS-Access program/database described here helps manage identification sets and produce teaching aids in a wide variety of formats. Subsets of the identification set are easily generated.

While identification is primarily a memorization skill there are two important aspects that are addressed: 1) Identification of the common elements in an area such as tools or trees is an important part of the “language” and our ability to communicate about the subject. 2) Identification should go beyond the name and incorporate the use and function. For example how is the tool used, where would you plant the tree, what are the attributes of the breed? Flashcard drills have been computerized but simple sets have been shown to be effective when the sets are commonly altered to include known and unknown items thus building on existing knowledge (Browder & Roberts, 1993). The approach of using a database for identification is not new however most such efforts are proprietary and not adaptable to a wide number of applications. Such an example is the horticultural database at Alabama A&M (Sabota, Beyl, & Ghale, 1995).

How It Works

There are a number of online flashcard applications that were considered for this project (Quizlet, 2014) (Study Stack LLC, 2014). Some of these sites provide an “app” for use on cell phones, but they do not provide a rich collection of output formats. Most sites offer a free version and a paid version with more features thus may not be free for a specific need. These sites are all driven by advertising revenue so the user must put up with some distraction. A number of desktop programs exist for flashcard type drill. For example Mnemosyne (The Mnemosyne Project, 2014). Many of these products are aimed at computer aided instruction drill and practice. These products lack a robust suite of output formats such as booklets, PowerPoint, quizzes, and HTML that can be used for different teaching methods. After weighing the pros and cons of the online and desktop offerings a Microsoft Access desktop solution was chosen.
The Access program requires a Windows computer with Access loaded (or at least the free runtime). The program is set up with a title; the identification set will be organized into at least one group and category. Typically multiple groups and categories will be used to organize items into logical subsets. For example plants might have groups such as trees, shrubs, and ground covers. Categories might be classification by size or color. Images are collected of medium quality and organized in one or more folders. Images are imported into the database. For each image data for the name, a description, and optionally multiple choice answers are entered. Data can be output as a booklet, list, worksheet, PowerPoint slides, flash cards, HTML, and multiple choice tests. Pedagogically an instructor might use a PowerPoint slide show to introduce a set, give the students PDF flashcards to practice, and then produce a test for assessment.

Each item is categorized to organize the data. Items are linked to image files in a directory structure defined in the database. To save time images can be saved to a directory and the entrie path imported into the database. The user controls the display order so items can be organized for display and printing. In order to create sets of items that build on prior knowledge as suggested by Browder and Roberts (1993) the teacher can simply load a previous set and add some new items. Once selected, the new set is output in a format such as PowerPoint or PDF Flashcards.

Results to Date and Implications

An agricultural mechanics CDE tool and materials ID set was created to replace a previously published manual. In addition to the manual PowerPoint presentations were generated and posted on the web site for coaches’ reference. Updating these references is now as easy as changing the tools and republishing the materials. Coaches have been very complimentary of these resources and use them for coaching as well as in their courses. The database and images were “zipped” into a folder and posted on a web site (Spiess, 2014) for downloading by teachers. Subsets of this database were used to create flashcards and tests for a college level Introduction to Agricultural Mechanics course. Students found the flashcards helpful for studying tools and materials identification throughout the course. By providing targeted flashcards in the learning management system (LMS) and using PowerPoints for quick drills in class student performance on quizzes improved. By providing many targeted study sets online, students can study on their own thus freeing up class time for other activities. Sets were quickly generated into PDF or
HTML format for posting on the campus LMS saving many hours of preparation time. All functions of the program are accessed from a simple menu. The major implication of this system is the time savings to create sets of items based on pedagogical need. The ability to output items in multiple formats also can be used to support different learning styles. Users familiar with Access also may create their own output formats.

**Future Plans/Advice to Others**

Currently a set is being developed for livestock and the veterinary science CDE. Additional datasets are under consideration for the small engines CDE and agronomy CDE by secondary teachers interested in these areas. The potential exists to use this system as a term/definition drill tool using just the name (as term) and description (as definition) fields. Minor changes in the output options would support this as no images are needed.

**Costs and Resources Needed**

The database program is available for free download. The major expense is the time to create the identification set. Typically it takes 3-5 minutes per entry. Once built, time is saved since items are easily manipulated into various formats.

**References**


Mentoring the Next Generation of Scholars: A Collaborative Field Research Methods Course Combining Graduate and Undergraduate Researchers

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Introduction/Need for Innovation

Research can be a daunting task. Studies have shown conducting research to be a source of apprehension for new students entering graduate school (Austin, 2002; Lopatto, 2004). Prior research experience can be helpful; conducting undergraduate research has been shown to be a positive factor in undergraduates choosing to pursue a graduate degree (Russell, Hancock & McCullough, 2007). Conducting quality research is an important career skill for students to acquire through both undergraduate and graduate school, and should be addressed at all levels of the educational process (Austin, 2002). This innovation directly addresses priority four of the AAAE research agenda to develop “meaningful, engaged learning in all environments” (Doerfert, 2011). To fully engage the next generation of researchers, agricultural education should work to develop methods of instruction in research methodology that are challenging to students, while allowing them to become comfortable with the research process.

To formulate an innovative, student-centered course in applied field research, several factors were taken into consideration. Undergraduates have been shown to comprehend research at a higher level when learning through experience (Brew, 2010). Drawing on experiential learning concepts (Kolb, 1984) led faculty to develop a course outline firmly rooted in active experimentation and concrete experience, combined with the opportunity for abstract conceptualism and an emphasis on reflective observation. A focus on experimental learning has been shown to increase the effectiveness of instruction and retention of research concepts (Benson & Blackman, 2003). Another factor considered in course design was the conscious choice to teach the course using a constructivist approach. Constructivism has been shown to promote deeper understanding of abstract concepts, like research methodology, as it allows the learner the opportunity to define their own path to learning (Splan, Porr & Broyles, 2011). Another decision considered by faculty developing this course was the pairing of undergraduate and graduate students in the same section of the course. Researchers have concluded that pairing undergraduate and graduate students in collegial relationships dealing with research may be complicated, but these relationships often have a beneficial outcome for both groups of students and the faculty advisor (Dolan & Johnson, 2010).

This innovative class sought to fill the need for a challenging course to effectuate learning in both undergraduate and graduate level students in field research methods. Prior to this course, the need for a course and factors of interest were established, although questions still existed for examination. The results of the innovation were examined in comparison to the following guiding questions:
1. Does the pairing of graduate and undergraduate students within a section of field research methods course increase student understanding and comfort of field research methods?
2. Is experiential learning an effective tool to use in a field research methods course?
3. Does the nature of a field research course lend itself to a constructivist course design?
4. How important is the practical application of the concepts through industry partnership to the overall success of the class?

How it Works

This undergraduate/graduate level course was designed to include lecture components on research methodology, including components of qualitative research such as conducting interviews, coding data, and establishing trustworthiness, along with components of quantitative research including analyzing data and designing valid and reliable instruments. Extensive class time was also dedicated to provide students with venues for active experimentation and concrete experiences. By facilitating the course working with an industry partner, research concepts could be applied in real-world settings.

Students enrolled in the course were paired in groups including both undergraduate and graduate students and given group deliverables based on the desires of the industry partner. Group members were instructed to work as colleagues in all aspects of creating deliverables for the course, in order to foster a relationship between graduate and undergraduate students with the absence of hierarchy. The absence of concrete assignments allowed the course to function from a constructivist approach. Student groups developed their own unique final research analysis for presentation to the industry partner.

Results to Date/Implications

Twenty-nine students were enrolled in the course over the course of the semester. Students conducted quantitative data analysis related to an online survey instrument, along with conducting five organized focus groups, and more than 300 qualitative interviews. Combined graduate and undergraduate teams worked to code and analyze data and presented the industry partner with high-quality summaries of the research study conducted.

Students enrolled in the course reported that the nature of the course design improved their overall confidence in the research process. Many undergraduate students emphasized that the opportunity to work with classmates that were already familiar with research methods made them feel more comfortable in making mistakes and asking questions. Others mentioned that they now feel prepared to take on an undergraduate research program. Graduate students felt the chance to guide their undergraduate counterparts through the data collection, analysis and presentation of a finished product, significantly enhanced their ability to perform future research. Many students also stated that the collaboration with an industry partner helped connect abstract research concepts to real life scenarios.
Future Plans

The success of this course has prompted faculty members to re-examine the nature of the current research sequence, in order to continue a cross level applied research methods course. Additional examination will include refining the course design and objectives to further facilitate the learning of research methods in an applied constructivist setting.

Costs/Resources Needed

Support from the department in teaching a cross level course was paramount to the success of this project, as was the cost of funding for faculty to instruct the course. In addition, the acquisition of an industry partner for application of research concepts was an incredible asset to the success of this course. Data collection required travel and on-site visits that were funded by the industry partner.

References


Statewide Agricultural Education Initiative

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Introduction/Need for the Idea

Federal, state, and local funding has been a consistent concern for career and technical education programs, and specifically agricultural education programs, since their inception. Idaho has provided added cost funding to all career and technical education programs at levels appropriate for the program in question. However, due to recent economic downturns, the level of added cost funding has not increased since 1998 (State Division of Professional-Technical Education, 2014). During summer conference 2013, the state agriculture teachers’ association voted to explore the possibility of developing and supporting a legislative initiative to increase the level of state funding provided to operate secondary agricultural education programs.

How It Works/Methodology/Program Phases and Steps

The Idaho Vocational Agriculture Teachers’ Association brought the concept of the legislative initiative to Idaho Team Ag Ed for input and implementation. A committee was formed that included secondary teachers, state staff, and teacher educators to establish priority areas for the initiative prior to contacting key legislators to sponsor the writing and proposal of the bill. Working with legislators supports Priority Area 1: Public and Policy Maker Understanding About Agriculture and Natural Resources and the goals of the initiative support Priority Area 5: Programs of Demonstrable Efficiency and Effectiveness of the National Research Agenda (Doerfert, 2011).

The Initiative Steering Committee established five goals/priority areas for the initiative (Idaho Ag Ed Initiative, 2014):

1. Adjust and fully fund added cost allocations
2. Restore full time Idaho FFA Association Executive Director Position
3. Expand statewide professional development and mentoring program
4. Implement Idaho Quality Program Standards and incentive grants
5. Create a pilot for agriculture and natural resource education program start up grants

A grant was received from the J. R. Simplot Company to hire an advocate for the initiative who would see the project through proposal to the legislature, the legislative session, and final implementation of the components of the initiative. The selected individual was a former Idaho FFA President who has been a lobbyist and staffer in Congress and currently owns her own consulting form. Her understanding of agricultural education and the legislative process served as a major asset to the initiative. Once the goals and lobbyist were in place, Senators and Representatives who have been long term supporters of agricultural education were contacted about the potential of sponsoring the proposal in 2015. The targeted legislators encouraged Team Ag Ed to propose the legislation in 2014. As a result, Team Ag Ed with the primary support of the Idaho Alumni Association established 5 round table meetings throughout the state to gather stakeholder input on the contents of the initiative and secure stakeholder support of the initiative. Over 300 stakeholders from the agricultural industry attended the round table
meetings and over 90 agricultural businesses added their names and logos in support of the initiative (Idaho Ag Ed Initiative, 2014). One bill was sent through the legislature which addressed incentive grants which would be awarded based on secondary instructor scores on the Idaho Quality Program Standards and program implementation grants. Additionally, added cost funds were addressed in the Idaho Division of Professional Technical Education budget for agricultural education programs and all other CTE program areas. The Idaho FFA Association Executive Director Position was added to the University of Idaho College of Agricultural and Life Sciences budget. The mentoring and professional development priority was not addressed by the legislature as agricultural education has access to the Idaho Department of Education mentoring program funds.

Results to Date/Implications

Senate Bill 1275 funding the Agricultural Education Incentive Grants and Program Implementation Grants passed the House and Senate nearly unanimously and was signed into law by the Governor on April 1, 2014. Teachers who meet the minimum qualifications and ratings on the Idaho Quality Program Standards will qualify for $10,000 incentive grants which are renewable annually. It is anticipated that up to 40% of Idaho teachers will qualify in the first year. School districts starting new agricultural education programs can qualify for up to $25,000 in implementation grant moneys. State added cost fund allocation for agricultural education programs were increased from $10,260 per FTE to $15,000 per FTE, a 46% increase for FY15 which was placed in the state PTE budget along with a 5% increase for all other program areas. The Idaho FFA Association Executive Director position was added to the College of Agricultural and Life Sciences budget and included $85,000 for salary, benefits, travel, equipment and supplies for the FY15 budget.

Future Plans/Advice to Others

The next two years will be key to determining the continuation of the Idaho Agricultural Education Initiative. The Idaho Quality Program Standards and quality indicators are currently being developed by a committee including a secondary teacher, state staff, and teacher educator. Input is being gathered from all stakeholders and the final draft will go to the Idaho Board of Education in July. The rules for distribution of grants are being developed by the state department of education and will go the State Board for approval this fall. Increased added cost funds will be distributed to programs in October as part of FY 15 and the State FFA Executive Director position is currently advertised and will by filled by July 1, 2014. Other states attempting a similar initiative should be sure to have all stakeholders in support of the concept and then select key legislators to support and sponsor the bill(s). Secondary teachers, FFA members, and industry supporters were also key in testifying to the legislature and gaining their support. Industry support, both in the form of the grant for the lobbyist and publicity for the initiative were also key in its success.

Costs and Resources

The key resources for the initiative were people willing to spend their time supporting the initiative. The $12,500 grant from J. R. Simplot Company was used to cover the cost of the
lobbyist and roundtable events throughout the state. Cost to the state to fund the project totaled approximately $250,000.00.

References


A first-year university student was leaving the Agricultural Education major. Her advisor asked, “Why are you leaving? I think you’d make a great teacher.” The student responded that she just didn’t see herself as an agriculture teacher. Is it possible that we are not providing students enough opportunities to ‘see’ agriculture teachers and to understand that they don’t have to look like the agriculture teachers that they knew growing up?

Many argue the reality of a shortage of school-based agriculture teachers in the U.S. (Kantrovich, 2010). Regardless of the argument, the reality is that 22 agriculture programs across the nation closed during the 2012-2013 academic year because they couldn’t find a teacher, and 146 programs operated during that same time frame with a teacher not licensed to teach agriculture (National Association of Agricultural Educators, 2012). Further, a high percentage of teachers who were prepared through traditional teacher education programs will not move to another state to take a teaching position (The Council for Agricultural Education, 2013).

Wenger (1998), a social learning theorist, introduced the concept of communities of practice. He stated, “communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly” (Wenger, 2012, p. 1). Developing a community of agricultural education pre-professionals that goes beyond state and institutional boundaries, while exploring a variety of agricultural education programs throughout a region, may be a possibility for encouraging students to look for teaching positions outside of their home state and to allow students to “see” themselves as agriculture teachers.

How It Works/Methodology

Twenty students and three faculty members from two land-grant institutions participated in a trip to visit six secondary agriculture programs in two days. The goals for the trip were to (a) provide students an opportunity to see “what an agriculture teacher looks like”; (b) build an understanding of varied agriculture across the region; (c) allow for students to interact with agriculture programs that differ in terms of size of school, size of agriculture program, experience of the teacher, and training of the teacher; and to (d) expand student networks.

Phase 1 Planning: University of Idaho (UI) and Utah State University (USU) faculty members agreed to visit agriculture programs in southeastern Idaho. Programs were selected that would illustrate the many characteristics of agriculture teachers, including first year teachers and a 40-year veteran teacher; single teacher programs, and a five-teacher program; male teachers and female teachers; and alternatively certified teachers and teachers with traditional degrees in agricultural education. Teachers were contacted and scheduled for a 1-hour visit at each program, including a tour and discussion with the teacher-candidates.
**Phase 2 Implementation:** Students were expected to ask questions during the tour, including questions about students, curriculum, personal life, and future plans for the teacher and the program. During travel between programs, students were shuffled between vehicles and the faculty members to guide thinking about the program that was visited, as well as to make connections between the programs. Four programs were visited on the first day, concluding with a hosted supper by the USU students on their campus. All students and faculty enjoyed an informal meal and conversation. On the second day, the group from UI continued to visit two more programs while traveling.

**Results to Date/Implications**

A total of 23 students and faculty participated in this network-building trip. Camaraderie within each school has increased due to the time that students spent together in the vehicles. Students have also expanded their teaching networks, now knowing future teachers from another institution as well as current teachers from their state or region. Students were able to see what teachers look like, and identified a variety of strengths and differences. One student said, “The facilities don't make the program. The integrity, and push from the teacher to be involved in FFA is the only way students are going to be motivated to join.” Farming practices generally vary greatly within a single state. Questions that were asked by students were, “How did you learn about the farming practices in your community?” and, “How do you decide what curriculum to teach?” Students saw value in the trip. One student stated, “It was getting to see the differences in programs, facilities and teaching styles and teachers so that some day when I am a teacher I will be able to pull ideas from the programs that I really liked and stay away from ideas that I didn’t really like so that I can be the best teacher I can be.” Students began to understand the scope of agricultural education. One student probed the faculty members about their connections to each other, and how their relationship started. Professional organizations were attributed to helping us develop our networks, and students were encouraged to attend conferences and seek opportunities for professional development. A student remarked, “When we're out in the profession, we could teach in the same area. The more connections that we have as teachers the easier it will be to teach agriculture because we will always have someone to help us.”

**Future Plans/Advice for Others**

This trip can have broad appeal, it is easy to replicate, and is adaptable across the country. Several ideas have been generated for future events when co-mingling students from different institutions. The ideas are presented in a numbered list:

1. Structure some ‘down time’ early in the evening, and then conduct a later-in-the-evening event to review the day.
2. Develop projects for the students to present a lesson to high school students; to learn a new technical skill; or to judge and evaluate students for a class project.
3. Consider the selection process for which students from each institution that attends.
4. A combined meal, followed with a social activity, seemed to be appreciated by the students because they could get to know each other better.
Costs/Resources Needed

Costs included transportation, food, and lodging:

- Transportation: 1 Suburban ($150/day, including fuel), 1 mini-bus ($320, including fuel)
- Food: Students purchased their own breakfast ($10), lunch ($10), and snacks. Supper cost ($12 per person, including ice cream during the campus tour)
- Lodging: Hotel rooms, with four students per room ($75/room)

Total expenses per student were approximately $140 for UI students because they had to travel a significant distance and had two nights of lodging associated with the trip. The expenses per student for USU students were approximately $40 per student as no lodging was required and less travel was involved. These costs will vary depending on the location of the programs visited.

References


Urban Leadership through Food Systems

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Introduction/Need for Innovation or Idea

Over 43% of the residents in the Linden neighborhood of Columbus, Ohio live below the poverty level with 18.6% considered living in extreme poverty. More than 37% of households in the neighborhood received supplemental nutritional assistance (SNAP) in the past 12 months (City-data.com, 2014). The public neighborhood high school, considered a “STEM” school, reported a graduation rate just under 68% with only 11% of students meeting the state’s annual measurable objectives during the 2012-2013 school year. Over 92% of students were considered economically disadvantaged (Ohio Department of Education, 2014). Based on the United States Department of Agriculture’s (USDA, 2014) definition, the Linden area is considered a food desert because healthful, affordable food is difficult to obtain, with the only available food purchasing options within a reasonable walking distance providing primarily calorie-dense food with little or no nutritional value.

Extension programming, while traditionally rural based, has increased its focus on urban areas over the past few decades (Borich, 2001). Urban focused Extension programs have included the Expanded Food and Nutrition Program (EFNEP), 4-H youth development and mentoring, and urban Master Gardeners, to name a few. These and other urban based programs have experienced a variety of success. In a national study of urban Extension faculty, Fehlis (1992) reported that Extension professionals were concerned about their effectiveness in programming and lack of direction and expectations from administrators. Can Extension programs be successful in developing urban leadership in neighborhoods such as this neighborhood?

Citizen leadership (Couto, Hippensteel Hall, & Goetz, 2009), an investment in people as members of a community, may be a means of increasing the success of urban Extension programming. Citizen leadership requires mutual trust, cooperation, and association with those impacted by the programs. Social goods and services provided must increase the “reasonable degree of well-being” of the individuals involved (p. 131). Genuine empowerment, focusing on the power within the individuals rather than power to or power over, is required for bringing about change (p. 133). “Citizen leadership facilitates organized action among people traditionally underrepresented in official decision making processes. It takes as its premise the dignity and worth of each individual, regardless of race, age, gender, income, or any other demographic factor” (p. 135).

How It Works/Methodology

Ohio State University (OSU) leaders have worked in the neighborhood, physically and programmatically engaging with the community in different projects and activities. Faculty members, with the help of an enthusiastic citizen paraprofessional, established the first 4-H club in Linden since the 1940s, when the community was a fringe neighborhood of Columbus. In addition, an urban garden was created in a vacant lot near the center of the neighborhood. The
garden consists of raised beds as well as other intensive production methods. The 4-H members were involved with all aspects of production, including preparing soil, selecting crop varieties, planting, weeding, irrigating, harvesting, and distributing produce. More than 20 student volunteers from OSU have served in the Linden 4-H and urban gardening project. Five faculty members from OSU’s Department of Agricultural Communication, Education, and Leadership have participated in Linden community meetings and events at various times during 2013. The primary factor has been involvement and buy-in by a few key citizens in the neighborhood. A secondary factor has been the focus of 4-H programming on improving the well-being of the youth and adults in the neighborhood.

Results to Date/Implications

The 4-H club includes a small number of youth from the neighborhood. While the numbers are few at this point, these members regularly participate in after-school programming multiple times each week. Minority youth represent the leadership of the 4-H club and have worked well to adapt the traditional 4-H model of using adult volunteers, targeting projects to showcase at a county or state fair, and, with a broader vision, have looked for ways their 4-H club can build the community. As an example of this citizen leadership, the youth decided that one-third of the produce from the urban garden project would be given to those in the neighborhood who were in greatest need, one-third would be sold locally, and one-third would be used in food prepared and served at a local café, which also served as the meeting location for the 4-H club. The proprietor of the café is one of the primary citizens providing leadership to the 4-H club. The program has since expanded to another after-school minority youth program with hands-on, science experiences in food systems, nutrition, and the environment.

Other measurable, but lesser value outcomes of the 4-H club include: the design, writing, and distribution of a youth community newsletter; service by 4-H club members at a local day care center where they taught about foods, healthy eating, and built vegetable planting beds; distributing food from the garden project at the Community Health Fair on a very hot Saturday in June; and planning and participation of neighborhood youth in the National Night Out in August. The club members also went on field trips in the Columbus food system network and to the university and even developed a blog site (http://4h4real4life4linden.wordpress.com/).

Future Plans/Advice to Others

Future plans include improving, expanding, and replicating this model and impacts to other Columbus communities. Additional plans include securing an OSU Extension location in the community to establish a long term presence in the neighborhood, not just itinerant workers and volunteers.

For those wanting to embark on a similar project, the best advice is to get out of your comfort zone. As agricultural education leaders, we need to change where we are willing to work. We are able to work in inner-city neighborhoods, but since it is not within our comfort area and familiar turf, we make excuses as we choose to ignore this high need population. The greatest need in agricultural education (in terms of populations and possible impacts) is inner-city youth and what we can deliver – urban leadership through food systems.
Costs/Resources Needed

Most of the expenses for this project, including salary for the paraprofessional, were part of the regular Extension budgeting for this county. Some small internal grants provided by the OSU College of Food, Agricultural, and Environmental Sciences were used to develop the urban garden and to purchase some supplies for the after-school activities. These grants totaled about $5,000. A larger grant proposal has been submitted for the upcoming year.

In the near future, a facility in the neighborhood needs to be secured if these efforts are to be sustained. A “safe-house” or “sanctuary” is required, and it can't be at the local public school. The school really doesn't want the after-school responsibility, is not available on the weekends and during the summer, and the youth are not interested in staying at the school one minute longer than the school day requires.

References


