Poster Selection Process
Southern Region Agricultural Education Conference
February 4-7, 2012
Birmingham, Alabama

Eighty-six submissions were received with forty-seven in the innovative idea category and thirty-nine in the research category. The acceptance rate for innovative idea posters was 77% and research posters was 92%.

Poster Reviewers
The following people generously and professionally donated their time to review poster abstracts. Without their commitment, the poster session would not be possible.

Anderson, Ryan	Iowa State University
Baker, Marshall	Oklahoma State University
Barrick, Kirby	University of Florida
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Chumbley, Boot	Eastern New Mexico University
Clary, Cynda	New Mexico State University
Edwards, Stephen	Virginia Tech
Epler, Cory	Virginia Tech
Falk, Jeremy	University of Idaho
Foley, Caitlin	Pennsylvania State University
Foster, Daniel	Pennsylvania State University
Gill, Bart	Western Illinois University
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Jones, David	North Carolina State University
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Touchstone, Allison	University of Idaho
Tummons, John	University of Missouri
Warner, Wendy	North Carolina State University
Warnick, Brian	Utah State University
Weeks, William	Oklahoma State University

[State] Secondary Teachers Perceptions of a Visual Communications Program Involving Curriculum and an Experiential Learning Activity

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[State] Secondary Teachers Perceptions of a Visual Communications Program Involving Curriculum and an Experiential Learning Activity

Introduction / Need for the Research / Conceptual Framework

With the growing availability of technology and as the general public becomes further removed from the farm, communication becomes critical to the promotion of agriculture (Bailey-Evans, 1994). "Communications in agriculture is designed to introduce students to topics related to promoting agriculture through a variety of media sources" (Oklahoma Instructional Media Center, 2010, ¶5). In 1999 the National FFA Organization, a student organization associated with agricultural education in secondary and post-secondary schools, organized the first career development event (CDE) for agricultural communications. Since that time the FFA Organization has gathered resources for agricultural science teachers to utilize when teaching students about agricultural communications. The national organization's website contains links to numerous resources including *The Guidebook for Agricultural Communications in the Classroom*. However, since the incorporation of the agricultural communications CDE and the development of guidebook, [state] has not yet developed an educational framework in agricultural communications to teach students about technologies and careers associated with the field. Also, the most recent National Research Agenda notes priority areas important to agricultural communications curriculum and training in secondary education programs through the development of: meaningful, engaged learning in all environments (RPA #4) and efficient and effective agricultural education programs (RPA #5) (Doerfert, 2011).

In an effort to promote agricultural communications, especially visual communications, *The Visual Communication on the Road in [State]: Video and Photo Creative Projects to Promote Agriculture* (Visual Communications) program was developed. The Visual Communications program includes a two to four week curriculum unit, taught by the agricultural science teacher in any course, and a full day, hands-on, experiential activity (mobile classroom), facilitated by university faculty and students utilizing a mobile classroom. Teachers were provided electronic access to the curriculum, which included lesson plans, instructional PowerPoints, worksheets, activities, and handouts. Lessons in the curriculum unit covered basic photography, news and feature writing, and videography. The mobile classroom was equipped with computers, digital SLR cameras, and video cameras. Secondary students spent a full day collaboratively taking photos and capturing video that supported their agricultural storyboards (created during the curriculum unit of instruction). After the students captured photographs and video, they worked in the mobile classroom with Adobe Photoshop and Premiere Pro to edit and complete three to five minute promotional videos about agriculture.

[State] lacks visual communication based frameworks. Therefore, secondary agricultural education teachers need curriculum and training in agricultural communications, specifically visual communications to provide career relevant experiences for students.

Purpose and Methodology

The purpose of this study was to assess [state] agricultural science teachers' perceptions of the Visual Communications program to determine improvements needed and if project expansion would be accepted. Teachers who taught the Visual Communications curriculum were surveyed after project completion. Agricultural science teachers assessed the curriculum units and the hands-on, experiential activity (mobile classroom) through an electronic survey via

Survey Monkey. Upon completion of the program, project administrators sent an email to the teachers with the link to the instrument. The survey instrument, consisted of yes/no, varied Likert type scales, and open response questions. Questions regarding the curriculum and the program included the ease of access and student engagement and experience. Instrumentation development followed Dillman's Total Tailored Design method (2007) to increase participation and reduce instrumentation bias in question wording. The instrument was assessed for face and content validity by a panel of experts. Data were analyzed using descriptive statistics (means, standard deviations, and percentages).

Results and Findings

All [State] agricultural science teachers participating in the project during the fall 2010 (pilot) and spring 2011 were assessed. A 77.8% response rate ($n = 7$) was achieved. Demographic findings discovered that teachers participating in the project had a range of teaching experience: 28.6% less than one year, 14.3% one to three years, 14.3% six to ten years, and 42.9% more than ten years teaching experience. Gender of the participating teachers was 71.4% male and 28.6% female. Grade level presently teaching was 71.4% ninth through twelfth grade and 28.6% seventh through twelfth grade.

Results from the teachers' assessment of the project rated several variables associated with the project curriculum, the mobile classroom day visit, overall experience and student participation. On average, teaching the curriculum took teachers 13.57 days and the curriculum was taught in a variety of secondary agricultural science classes (Agriculture Business, Agriculture Marketing, Biological Animal Science, Leadership and Communications, and Agriculture Science and Technology). Participating teachers spent between six and ten hours preparing to teach curriculum. Teachers were asked to assess the provided instructional material (lesson plans, PowerPoints, handouts, etc.) based on how the materials met their needs (1 to 5 point Likert type scale with 1 = "strongly disagree" to 5 "strongly agree"). The mean rating of the provided instructional material was agreeable to neutral ($M = 3.80$; $SD = 1.10$). Teachers noted their ability to identify [state] educational frameworks in curriculum to the course where curriculum was taught was medium ($M = 1.86$; $SD = 0.38$) based on a 1 to 4 Likert type scale (1= "not at all" to 4 "high"). Teachers further noted that the Visual Communications curriculum was most likely to be applicable to their students' future ($M = 3.00$; $SD = 0.82$) based on a 1 to 4 point Likert type scale with 1 = "not at all" to 4 "very likely".

Conclusions, Implications and Recommendations

Teachers' perceptions of the curriculum were "agreeable" indicating that teachers found the curriculum to be beneficial. Overall, teachers agreed that students gained knowledge about visual communications through the Visual Communications program. Additionally, teachers perceived that the participating students were engaged and interested in the topic. Instructional material and the overall experience through this program were the most highly rated by teachers. It can be concluded that the development and implementation of the program was highly valued by the instructors. Through discussion of topics and competencies covered in this program, agricultural communications curriculum could be added to the agricultural education frameworks in [state]. It is unknown at this time if an entire course will be added or if curriculum will be added to an already existing course. Additional research should be conducted regarding skill-sets and industry knowledge before writing additional curriculum for incorporation into state frameworks. Teachers should also have access to workshops and resources that will allow them

to expand their knowledge of agricultural communications careers and competencies.

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A Descriptive Approach of Students' Perspectives toward eLearning Courses

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A Descriptive Approach of Students' Perspectives toward eLearning Courses

Introduction

Data indicates that distance learning instruction is ubiquitous in various agricultural education departments (Roberts & Dyer, 2005). Agricultural faculty are facing an increasing demand to provide online courses and student satisfaction with these courses should be routinely examined (Murphy, 2000; Kelsey, Lindner, & Dooley, 2002; Murphrey & Dooley, 2000; Roberts, Irani, Lundy, & Telg, 2004). The purpose of this study was to address the National Research Agenda of AAAE where enhancing student satisfaction in online courses relates to research priority 2, focusing on new technologies, practices, and products; and promoting student learning in online courses relates to priority 4, focusing on meaningful and engaged learning in all environments (Doerfert, 2011).

Theoretical Framework

The theoretical framework used in this study was the social presence theory and motivation needs theory. McClelland's (1987) motivational needs theory asserts that life experiences provide the formative basis for needs, and that these generally are classified into three categories: achievement, power, and affiliation. Within this framework, these needs shape individual motives and behaviors. In context, an individual seeking achievement will adopt practices that will facilitate achievement; those striving for power will assume behaviors that aid in the acquisition of power; and individuals requiring affiliation will work towards satisfactory relationships with others.

Short, Williams, and Christie (1976) define social presence as the salience level of one person's communication with other individuals and the resulting interpersonal relationships. Tu and McIssac (2002) established three components of social presence in the eLearning environment, are interactivity, social context, and online communication.

Methodology

eLearning is used to describe distance and online courses for the purpose of this study. The study's objectives were analyzed through the use of descriptive statistics. The population in this study was composed of graduate students enrolled in agricultural education eLearning courses at [university]. This study was conducted as a census, as the entire population ($N = 164$) was surveyed. Fraenkel, Wallen, and Hyun (2012) indicated a census enables the researchers to generalize the findings to the target population.

The combined instrument's reliability was calculated ex post facto to be $\alpha = .88$, resulting in a high degree of internal consistency (Cronbach, 1951). Qualtrics was used to administer a web-based questionnaire. The researchers utilized the Tailored Design Method for creating and disseminating an electronic survey (Dillman, Smyth, & Christian, 2009). One hundred sixty-four participants received the questionnaire, and 118 participants responded resulting in a 71.9% response rate ($N = 118$) in the study.

Findings

The objective of the study was to describe graduate student's learning environment, social presence, and satisfaction in eLearning courses. Instructor support (M = 4.28, SD = .63), student interaction and collaboration (M = 4.16, SD = .97), and student autonomy (M = 4.01, SD = .79) received the highest scores for learning environment. Active learning (M = 2.92, SD = .53) earned the lowest score from participants.

Describing student's social presence in eLearning courses was another part of the study's objective. The items that received the highest scores were "instructor facilitated discussion in the course" (M = 4.44, SD = .75), "I felt comfortable interacting with other participants in the online course" (M = 4.37, SD = .82), "I felt comfortable participating in the course discussions" (M = 4.23, SD = .79), "I felt comfortable conversing through this text-based medium" (M = 4.19, SD = .92), "computer-mediated communication is an excellent medium for social interaction" (M = 4.14, SD = .95), and "the instructor created a feeling of an online community" (M = 4.04, SD = .76) earned the highest score of the items in the Social Presence Scale. The item that received the lowest score was "messages in the online course were impersonal" (M = 2.51, SD = .91).

The items that earned the highest scores in students' satisfaction were "I am satisfied with this program" (M = 4.54, SD = .58), "distance education is worth my time" (M = 4.23, SD = .62), and "I enjoy studying by distance" (M = 4.09, SD = .66). The item that earned the lowest score was "I prefer distance education" (M = 3.18, SD = .79).

Conclusions

The findings lend support the two theories presented by the researchers, McClelland's Motivational Needs Theory and Social Presence Theory. The resulting scores for several areas lined up with the three needs, achievement, affiliation, and power. The students' scores also supported Short's social presence theory and the three dimensions of social presence theory in distance learning environments are interactivity, social context, and online communication (Tu & McIssac, 2002).

Implications/Recommendations/Impact on Profession

The increasing use of eLearning environments in agricultural education means that instructors will need to be aware of the effects, if any, of social presence on student satisfaction. Further research in this area should address the relationships between the variables discussed in this study. This research should be designed to determine if an increase social presence in eLearning environments leads to an increase in student satisfaction. The relationships determined by further study will help shape appropriate practice in terms of increasing student satisfaction.

Instructor involvement in the eLearning environment received high scores from students in terms of student satisfaction. Instructors should seek to make sure they are available for student support and interaction. Students also derived satisfaction from working with other students. Instructors in eLearning courses should seek to ensure and increase student collaboration and interaction. An eLearning course with an emphasis on these aspects should have strong student satisfaction. The increasing use of eLearning in agricultural education programs means that instructors will have to be aware of the

effects of social presence on student satisfaction. Results from this study inform agricultural education eLearning instructors' approaches to incorporate meaningful and engaged learning, and practices to promoting student learning (Doerfert, 2011).

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Research Poster

Addressing the Divide: A Comparison of the Needs and Preferences of Small Farmers

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Addressing the Divide: A Comparison of the Needs and Preferences of Small Farmers

The United States extension system began in 1914 as a way to distribute and extend land- grant knowledge and resources to rural communities (National Institute of Food and Agriculture [NIFA], 2011). A longtime recipient of these extension services is the small farmer (Hazell, 2011; Stephenson, 2003). The United States Department of Agriculture (USDA) defines a small farm as a farm with gross sales less than $250,000 per year (Economic Research Service [ERS], 2011). Approximately 97% of United States farms are small (ERS, 2011), while it is estimated that 93% of [state] farms are small farms (Gaul, Hochmuth, Israel, & Treadwell, 2009).

Small farmers have been and continue to be an important clientele group of the extension service in [state]. However, as suggested by previous research, small farmers are diverse in their needs, necessitating an extension service that is well acquainted with the local clientele in order to effectively meet these needs (Dougherty & Green, 2011; Gaul et al., 2009). The current research is focused on identifying the relationship small farmers have with extension services within different geographic regions of the state. Understanding the geographic differences contributes to Priority Area One of the National Research Agenda (Doerfert, 2011) by providing an increased awareness of preferred delivery methods and perceived effectiveness of extension services in various regions of [state], as well as individual attitudes, perceptions, and forms of engagement with the local extension service.

Theoretical Framework

The theories of digital divide and media richness provide the theoretical framework for this study. Digital divide theory suggests a "dichotomous divide between those citizens who are 'connected' and those citizens who remain 'disconnected' from technology, information and, it follows, modern or postmodern society" (Selwyn, 2004, p. 344). It is suggested that the digital divide is affected by demographics including socioeconomic status, income, gender, race, age, household dynamics, and area of residence (Rainie et al., 2003; Selwyn, 2004). Caucasians tend to be more connected than African Americans and Hispanics, while urban and suburban residents are more connected than rural residents (Rainie et al., 2003).

Media richness theory suggests that individuals are more successful at processing information when media characteristics match individual needs (Daft & Lengel, 1986). The theory indicates that the richness of the media for an individual is affected by "the ability of the material to transmit multiples cues (e.g., vocal inflection, gestures), immediacy of feedback, language variety, and the personal focus of the medium" (Dennis & Kinney, 1998, p. 257-258). Daft & Lengel (1986) purport richer media (e.g. face-to-face communication) are used for complex information dissemination, and media lacking richness (e.g. print based documents) are reserved for simpler information.

Methods

Focus groups methodology was used to investigate the needs of small farmers across geographical locations in [state]. Focus groups are commonly used to identify gaps between experts and their target audience (Morgan, 1998). Six focus groups were conducted in three different geographic locations of [state], with two focus groups per region. Fifty-nine participants, recruited by an external marketing firm, took part in the

focus groups. The use of environmental triangulation for location was used to address concern of diversity among the geographically different focus groups (Guion, Diehl, & McDonald, 2009). A consistent questioning route, used throughout each of the focus groups, was guided by a protocol developed according to the procedures outlined by Krueger (1998) and Greenbaum (2000). Audio-recordings were made and transcribed for each focus group. Focus groups were moderated by the same experienced, trained moderator, who completed analysis of the focus groups using Glaser's (1965) constant comparative method.

Results and Findings

Individuals participating in this study were from communities in either the northwest, north central or southwest regions of [state]. Results indicate that the participants who reside in the north-west differ from those in the other two locations. Participants in the northwest were primarily African American, while the other two locations were made up predominantly of Caucasian participants. Additionally, many northwest participants reported more than ten years of farming experience and identified themselves as third generation farmers. Participants in the other two locations primarily reported less than 10 years of farming experience and identified themselves as first-generation farmers.

Participants from the northwest repeatedly referred to seeking help and extension services from nearby states, rather than services within [state]. Use of other states' extension services was not observed in the other two locations. Northwest participants frequently referred to wanting information presented in person or in hard-copy publications. Participants in the other two locations expressed greater preferences for receiving information through the Internet and electronic documents. Finally, northwest participants exhibited preference toward extension agents making farm visits. One participant reminisced on the historical extension process:

> My mother is right at 80 years old and she said the extension agent would come around…And then you had the extension agent that would go out in the field and talk to the farmers and show them the new research, this, that and the other. And that doesn't happen. Nobody has time for you anymore.

Participants in the other two locations did not express these same concerns to extent that the northwest participants did. Many indicated using alternative solutions such as e-mailing their extension agent pictures to address a problem on their farm.

Conclusions and Recommendations

Results of this study indicate that preferences and needs small farmers vary in different geographic locations of [state]. Northwest participants seeking information from other states' extension services may be due to the type of crops being grown in the area. These crops are more similar to crops grown in the other states than those grown in the rest of [state]. It is also suspected that information provided to northwest farmers from those states may align more closely with their favored media richness (Daft & Lengel, 1986). This focus on hard-copy documents and face-to-face communication is evidence of the digital divide. These participants rarely discussed being connected to the internet, were from a more rural part of the state, had a lower socioeconomic status, and were primarily African American (Rainie et al., 2003). Finally, the focus on historical extension process by the northwest participants may be due to their extended experience with farming and their families' history of farming.

Based on these findings, it is suggested that a one-size-fits-all approach to extension is not appropriate when working with the small farm population. Small farmers in the northwest have demonstrated different geographical, cultural, and agricultural needs than those in the other two locations. It is recommended that the extension service conduct follow-up surveys in each county in order to adequately address the needs in each location. The information provided in this study has helped identify the delivery method preferences and the effectiveness of extension among small farmers in [state].

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Agricultural Education Program School Schedules in Relation to Classroom Instruction, FFA, and SAE

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Introduction/Need for Research

Researchers, policy makers, and educational leaders have focused on school scheduling as a means for educational reform. According to Andrews (2003), approximately 50% of schools in the U.S. once operated on some form of block scheduling. The rise in popularity for a chance in scheduling has been attributed to multiple benefits such as more time to focus individually on student needs, less class preparations, increased number of electives, and lower school budgets (Traverso, 1996; Zepeda & Mayers, 2006). A variety of options in secondary school schedules has increased because there is a lack of research to support block scheduling actually improves student academic achievement (Stanley, Spradlin, & Plucker, 2007). Even with the diversity of schedules there is no concise answer as to what is the best schedule for high schools (Baker, Joireman, Clay, & Abott, 2006).

Within agriculture education research, Moore, Kirby, and Becton (1997) concluded that block scheduling allowed for increased enrollment in courses but FFA membership did not increase. In addition, teachers perceived that block scheduling had a negative impact on the overall program. A study with various secondary animal science courses found students on a 4x4 block schedule were significantly outperformed by students on a modified A/B block schedule (Edwards & Briers, 2000). Currently, a lack of research exists comparing multiple schedules within agriculture education.

The purpose of this research is to explore the types of secondary school schedules which exist in (STATE) and to describe school schedules in relation to Agricultural Education classroom instruction, FFA, and SAE.

Methodology

This study used a descriptive survey research design. A researcher-designed instrument was developed to explore which type of school schedule works best for agricultural education programs. The instrument consisted of open-ended and short answer options. The instrument was evaluated by a panel of experts (n = 6) for face and content validity consisting of faculty, administrators, and graduate students at the University of (STATE).

The population of the study consisted of secondary agricultural educators across the state of (STATE). During regional break-out meetings, at the annual summer teacher's conference, the questionnaire was distributed to each teacher in attendance. It should be noted as a limitation of this study, this sample may not be representative of all secondary agricultural education programs in (STATE). This convenient population produced 136 usable responses from agricultural programs in (STATE).

Results/Findings

A wide variety of schedules were reported. Of the school schedules, 30.1% of agricultural educators reported being on seven period day schedule, 18.4% on a trimester, 14.7 % on traditional six period days, 8.1 % on block schedule and 5.9% on A/B block schedule. Twenty-two percent of agricultural programs reported being on a differing type of schedule referred to as "other". These schedules ranged from five period days to six period days with a fourth period block for lunch.

Planning and discipline greatly affect classroom instruction. All teachers reported spending more than 8 hours per week in planning and preparation for class no matter the type of schedule. Discipline referrals differed greatly among the various schedules. The

largest average number of discipline referrals occurred in A/B block with 30.1 referrals each year, while the lowest average was reported in a 4x4 block with an average of only 4.9 referrals.

The difference in school schedules regarding FFA participation was determined by the average number of members, Career Development Events (CDEs), and community service projects. Agricultural education programs on an A/B block reported the highest number of FFA Members with an average of 136.3 members. Agricultural education programs on a seven period day reported the lowest average with 110.2 members. Agricultural educators with programs in schools on an A/B block schedule reported the lowest number of community service projects with an average of 3.6 per year. However, the educators with schedules considered "other" had the highest amount of community service projects with an average of 7.5 a year. Agricultural educators with programs in schools on the schedules considered "other" reported the greatest involvement in regional and state CDEs with an average of 19.1. The trimester schedule reflected the lowest amount of regional and state CDE participation with an average of 8.4 events out of a possible 45 each year.

The difference in school schedules regarding SAE participation was determined by the average number of students having an SAE project and the number of visits made by the agricultural educator. Agricultural educators on a trimester schedule reported the greatest average number of students with an SAE project at 116 and the highest average number of SAE visits per year with 43.7.

Conclusions

While a variety of known and widely used school schedules are in use in (STATE), many schools have determined other schedules which are effective for their needs. These schools may or may not take the agricultural education program into account when determining the schedule. Agricultural educators, on the average, spent more hours preparing for a seven period day. It should be noted that agricultural educators averaged more than 8 hours spent weekly in preparation no matter what schedule was followed. There was a large difference in the number of discipline referrals reported between school schedules. While having only 8% of the population of (STATE) on an A/B Block schedule, agricultural educators reported an average of 30.1 discipline referrals throughout the year. This was almost triple the highest average amount reported by teachers on all other schedules with an average of 11.5 referrals per year. The lowest average number of referrals was 4x4 Block schedule with only an average of 4.9 discipline referrals. Agricultural education programs with the largest amount of students each year, like trimesters, will of course have the largest number of members with an SAE Project and teachers should make the most SAE visits. However, it should be noted that school schedules with the lowest number of actual student interaction each year, such as block scheduling, had the highest averages of FFA membership participation in community service projects.

Implications/Recommendations

School administrators, site based decision councils, and educators should consider the various types of school schedules when planning. The time allowed by each schedule can have differences in time allowed for key components of an agricultural education program such as classroom instruction, FFA participation, and SAE.

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An Assessment of a Visual Communications Program in [State] Secondary Agricultural Science Courses

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An Assessment of a Visual Communications Program in [State] Secondary Agricultural Science Courses

Introduction/Need for the Research

Today, agricultural education provides training for all students, including those who will not be farming or entering the agricultural industry (Talbert et al., 2005). In 1999, the National FFA Organization organized the first career development event (CDE) for agricultural communications. Since the incorporation of the agricultural communications CDE and the development of *The Guidebook for Agricultural Communications in the Classroom*, [State] has yet to develop an educational framework in agricultural communications. Yet, the most recent National Research Agenda notes priority areas important to visual communications curriculum and training in secondary education programs (Doerfert, 2011). A need exists for secondary agricultural education students to gain practical skills and exposure to visual communications in order to obtain career relevant experiences due to this gap in the frameworks.

The *Visual Communication on the Road in [state]: Video and Creative Projects to Promote Agriculture* (Visual Communications) program was launched in 2010 creating curriculum for secondary agriculture programs. Curriculum covering photography, writing basics, and videography were designed by [University] staff. This curriculum included lesson plans, PowerPoint presentations, worksheets, activities, and assessments. Upon completion of the program, teachers, with state education staff, will be able to decide if the curriculum will be implemented into the frameworks for agricultural education. Congruently, Rogers (2003) outlined the five stage model of the innovation decision process: (a) Knowledge, (b) Persuasion, (c) Decision, (d) Implementation, and (e) Confirmation as the steps to finalizing an innovation. Therefore, the purpose of this study was to assess student perceptions of the Visual Communications program (curriculum and the experiential learning activity) to assist in developing future goals for the project.

Methodology

The population of the study consisted of a snowball sample of students enrolled in agricultural sciences courses in [state]. Upon completion of the curriculum by secondary teachers and students, faculty and staff from the [university] visited schools with the mobile classroom and helped student groups capture photos and video footage, and then compile a three to five minute video promoting an agricultural topic or story. Each participating school created two to five videos which were rendered and posted to YouTube. The pilot group was strategically targeted based on school location throughout [state] (n = 27 students) in the fall of 2010, while spring 2011 participating schools were self-selected based on teacher willingness to incorporate the curriculum into one of their agricultural science courses (n = 45 students). No significant difference was found between student data from the different semesters. Therefore, all data were compressed and reported together (n = 72 students).

Prior to curriculum being taught, students completed a questionnaire regarding previous knowledge and activity in agricultural communications. Upon completion of each specific curriculum unit, students completed additional instruments. Each

curriculum questionnaire referenced the topic and assessed the participants' knowledge of the specific visual communications area, how/if they enjoyed learning about it, its value to their education, and if they found it to be practical. Students also completed an instrument regarding the mobile classroom (video creation) experience. The research followed Dillman's Total Tailored Design
method (2007) to reduce instrumentation bias in question wording.

One pilot school was removed due to incomplete data sets being gathered (n = 13) and this group of students was not reported in the population numbers of this study. Twenty-six female students and 46 male students (N = 72) participating in the Visual Communications program had useable/completed responses for the perceptions instrument. Data were analyzed using descriptive (means, standard deviations, and percentages) and non-parametric (*Fisher's* exact test) and parametric (one-way analysis of variance and bivariate correlation) inferential statistics. The level of significance for all inferential statistical tests was established at .05 *a priori*.

Results and Findings

Student perceptions were assessed via a series of twenty questions based on a 1 to 7 Likert-type scale (1 = "strongly disagree" to 7 = "strongly agree") regarding their enjoyment, interest, and the practicality of the lessons taught. For the curriculum unit, students were agreeable in each category but not highly agreeable in any specific area. The enjoyment category overall indicated a mean of 5.56 (SD = 0.80), while practicality held a mean of 5.52 (SD = 1.03), and interest had a mean of 5.51 (SD = 0.93). Overall students were agreeable with statements regarding the mobile classroom, experiential learning experience. On a seven point scale (7 being "strongly agree"), students rated their enjoyment of the video production project with a mean equaling 5.69 (SD = 0.85), and their interest in the projects at 5.83 (SD = 0.96). Students agreed that the projects were practical rating practicality with a mean of 5.70 (SD = 1.02).

Conclusions and Recommendations

Students consistently agreed with their overall level of enjoyment, interest in the curriculum, and identified the practicality of incorporating agricultural communications curriculum into their coursework. Enjoyment of the curriculum as describe by participants resulted in a mean score of 5.56 (SD = .80). Participants held similar beliefs towards practicality (M = 5.52; SD = 1.03) and interest (M = 5.51; SD = .95). Therefore, respondents perceive the curriculum to have value towards use in this program and their learning. Because of the reflected perceptions through analysis, the researchers believe that respondents perceived the value of the curriculum and it is meeting their needs for the outlined program. Therefore, students' collaboration may have led them to have more positive perceptions; resulting in further understanding which agrees with Edgar (2007) and constructivist approaches to learning. It can be further postulated that the positive perceptions may have resulted in the basis for curriculum development which is aligned with PBL where it can be helpful for students to apply new concepts and ideas (USC-CET, 2006). Combined with the curriculum presented, this experiential activity may have elevated student perceptions through experiential learning (Kolb, 1984) and PBL (USC-CET, 2006). The authors agree that concrete experiences and active experimentation represented in the mobile classroom visit allowed students to take

reflective observations and abstract conceptualizations occurring during the presentation of curriculum and positively impact perceptions of the participants.

The Visual Communications program student perceptions assessments will continue via a longitudinal study. Through discussion of topics and competencies covered in this program, agricultural communications curriculum could be added to the agricultural education frameworks in [state].

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An Assessment of Pre-service Agricultural Educators' Aptitude in Solving Contextualized Mathematics Problems

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An Assessment of Pre-service Agricultural Educators' Aptitude in Solving Contextualized Mathematics Problems

Introduction, Conceptual Framework, & Need for Research

Evidence exists that supports the posit that American adolescents are not proficient in mathematics (National Center for Education Statistics, 2010). Many of these secondary students are not adequately prepared to utilize mathematics skills and concepts in their chosen occupations (Stone III, Alfeld, Pearson, Lewis, & Jensen, 2006). What perhaps may be more troubling, however, is the fact that as a considerable quantity of these students mature into adulthood and enter the workforce they still often lack basic understanding of traditional mathematics concepts and their applications in everyday life (Stone III et al., 2006). Significant ramifications of this revelation are not lost on the field of agricultural education teacher preparation, as indicated by prior research (Miller & Gliem, 1996).

Previous research (Parr, 2004; Conroy & Walker, 2000) has indicated that agriculture teachers are in a prime position in which to provide instruction in real-world applications of mathematics concepts that students often experience in everyday life. Agricultural educators can provide a meaningful context that often has the ability to challenge students to think about common occurrences and problems in new ways, i.e., contextualized learning and teaching (Parr, Edwards, & Leising, 2009). Furthermore, research (Parr, 2004; Conroy & Walker, 2000; Young, 2006) has documented that students and teachers have experienced positive outcomes as a result of contextualized mathematics teaching efforts within agricultural education.

While results have indicated that contextualized learning does indeed result in increased understanding of academic material without sacrificing technical competence (Parr, Edwards, & Leising, 2006), questions still linger concerning the preparedness of agriculture teachers to implement contextualized mathematics learning strategies (Miller & Gliem, 1996). These questions have often concerned themselves with the academic prowess of agriculture teachers (Miller & Gliem, 1996; Swan, Moore, & Echevarria, 2008). What is more, as demands for increased utilization of academic content within agriculture curricula have increased, agricultural educators have become more relied upon to successfully demonstrate academic theory alongside practical application (Conroy & Walker, 2000). To this end, the question that arose for study through this project was this: Do selected pre-service agricultural educators at [University] University possess basic mathematical problem-solving abilities in order to contextually teach mathematics through the secondary agricultural curriculum?

Objectives

The objectives of this research project were to:

1) Determine the mathematics competency of selected pre-service agricultural educators at [University] University.
2) Describe demographical characteristics of this population of pre-service agriculture teachers.
3) Determine selected pre-service teachers' self-efficacy concerning mathematics education within an agricultural context.
4) Determine if selected pre-service teachers intend to pursue teaching as a career.

Methodology

To accomplish these objectives, the researchers assembled a time-restricted seventeen-item contextualized mathematics assessment that tested the mathematical problem-solving abilities of selected pre-service agricultural educators (N=15) enrolled in upper-level agricultural education courses at [University] University. This assessment was compiled from selected problems previously presented to secondary agricultural education students that participated in the 2011 [State] District Agricultural Mechanics Career Development Event (CDE). To ensure face validity for the pre-service agriculture teacher population, this assessment was reviewed by a panel of experts with backgrounds in contextualized mathematics education and agricultural education. The experts agreed that this test was appropriate to give to this population. Furthermore, the pre-service teachers were also completed a short demographical questionnaire.

Results

Within this population, fourteen (N=14) pre-service agricultural educators at [University] University completed both the questionnaires and assessments. One student (N=1) completed only the questionnaire. The assessment had seventeen questions and tested the practical mathematics problem-solving abilities of the selected pre-service agriculture teachers. Overall, the average percentage score of this population on this particular assessment was 64.7% correct. However, scores ranged from a low of 47% correct to a high of 88% correct, indicating a significant degree of variance in the mathematical problem-solving abilities of these selected students. As reported in their questionnaire responses, all of the students in this population (N=15) completed at least one course in pre-calculus algebra or higher. Greater detail about the questionnaire results are given in the table below.

Table 1. *Demographical responses of selected pre-service agricultural educators.*

What is your class standing?	Sophomore: N=1; Junior: N=4; Senior; N=8; Graduate: N=2
What is your gender?	Male: N=13; Female: N=2
What is the range of your ACT sub-score in mathematics?	The ACT sub-scores are reported as follows: Did not take: N=1; 16-18: N=3; 19-22: N=3; 22-24: N=3; 25-28: N=4; 30-32: N=1.
Do you intend to pursue teaching as a career?	Yes: N=13; No: N=2
Can the secondary agriculture curriculum serve as an effective context for math education?	Yes: N=14; No: N=1
An agriculture teacher's math competency is important in order to teach mathematics problem-solving skills in agriculture classes.	Strongly agree: N=4; Agree: N=11; Disagree: N=0; Strongly Disagree: N=0
My own math competency is strong enough to complete agriculturally-based math problems.	Strongly agree: N=6; Agree: N=9; Disagree: N=0; Strongly Disagree: N=0
I am knowledgeable in a variety of agricultural applications that require the use of math.	Strongly agree: N=7; Agree: N=8; Disagree: N=0; Strongly Disagree: N=0

Pre-service teachers should be knowledgeable in both academic and technical agriculture concepts before obtaining a teaching position.	Strongly agree: N=7; Agree: N=7; Disagree: N=0; Strongly Disagree: N=0; No response: N=1

Conclusions/Implications

It is evident that this population, which mostly holds a strong belief in contextualized mathematics education and the potential within the agricultural curriculum for this opportunity, is not prepared to solve a variety of mathematics problems within the context of agriculture, as also found by Miller and Gliem (1996). What may be more troublesome is that while the individuals within this population overall feel that their agriculturally-based mathematics problem-solving skills are strong, the results of this assessment indicate otherwise. For further remediation and practice, perhaps required undergraduate agriculture courses should emphasize mathematical problem-solving to prepare these teachers to enter into the agriculture classroom (Miller & Gliem, 1996).

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Research Poster

An Assessment of the Perceived Needs and Competencies of Florida Agriculture Teachers

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An Assessment of the Perceived Needs and Competencies of [state] Agriculture Teachers

Introduction/Need for the Study

Barrick, Ladewig, and Hedges (1983) posited that secondary teachers of agriculture have a desire for continuing professional development, and that providing professional development to secondary agriculture teachers is an important component of the responsibilities of teacher educators (Barrick, Ladewig, & Hedges, 1983). Newman and Johnson (1994) suggested that assessing the needs of teachers is an important step in the process of developing professional development activities. As a result, teacher educators should provide for communication of agriculture teachers' needs and subsequently should deliver professional development training based on the indicated needs.

Many investigations into the professional development needs of agriculture teachers have been conducted. Previous research has found that writing grants, modifying curricula to keep pace with technology, designing courses to help recruit students (Washburn, King, Garton, & Harbstreit, 2001), teaching with computers, preparation of FFA degree applications, teaching with multimedia equipment, preparation of proficiency awards, and teaching record-keeping (Layfield & Dobbins, 2002) are all areas where agriculture teachers desire professional development. Additional studies found that student motivation, public relations, integrating science into teaching, utilizing advisory councils, creating opportunities for Supervised Agricultural Experience (SAE) programs, supervising SAE programs, completing paperwork for administrators, and classroom management are also perceived needs of teachers (Garton & Chung, 1996; Joerger, 2002). However, Roberts and Dyer (2004) submitted that the inservice needs of agriculture teachers change over time.

Priority area five of the *National Research Agenda* (Doerfert, 2011) stated that research should be conducted that helps develop "efficient and effective agricultural education programs" (p. 10). Therefore, the purpose of this study was to investigate [state] agriculture teachers' perceived needs and competencies pertaining to professional development, in order to more accurately and effectively plan professional development activities.

Methods

The population for this study consisted of a census of the secondary agriculture teachers in [state]. The current state directory of teachers was used as the sampling frame. The instrument was administered online using Qualtrics, and follow-ups were made through personal contacts at a state-wide conference, which yielded a response rate of 54%.

The survey instrument used in this study was created by the researchers utilizing the Borich (1980) Needs Assessment Model. The Borich model measures participants' perceived knowledge about an item, as well as the participants' perceived relevance of

that item. A Mean Weighted Discrepancy Score (MWDS) is calculated for each item, which indicates the participants' level of need. According to Borich, a negative MWDS suggests a low need for training on a particular item, while a positive score indicates participants require training. Furthermore, the closer to zero a MWDS is, the less the magnitude of the need.

To construct the instrument, a search of the literature was conducted to help identify possible professional development need areas. Once the list of need areas was compiled, the researchers narrowed the list down by removing duplicate items and items that were deemed irrelevant for this group of teachers. The final instrument contained 79 items that represented total agriculture program management.

Results

Results of the study revealed that the area in which agriculture teachers most desired professional development was *managing stress* (MWDS = 4.33, n = 184), followed by *balancing work and personal life* (MWDS = 4.11, n = 183), *preparing students for industry certifications* (MWDS = 3.91, n = 190), *managing time* (MWDS = 3.35, n = 184), *repairing and reconditioning agricultural tools and equipment* (MWDS = 3.25, n = 184), and *teaching problem solving skills* (MWDS = 3.02, n = 193). Conversely, *recruiting students* (MWDS = -2.28, n = 203) was the area in which the agriculture teachers indicated the smallest need for professional development. Another interesting finding was that the items concerning technical agricultural content all had low Mean Weighted Discrepancy Scores (MWDS .21 to 1.54), which indicated that teachers perceive a low need for professional development in these areas.

Recommendations/Implications

While previous studies have found that teachers desire professional development in the areas of technology use, preparing award and proficiency applications, and classroom related issues, the participants in this study indicated a need for professional development in areas pertaining to personal issues. One recommendation from this study is that more professional development activities focusing on helping teachers manage their careers should be explored. Additionally, further research should be conducted to determine what stressors agriculture teachers are experiencing and if this is a pervasive problem in other states.

Another issue raised by this study is that, because teachers indicated low needs in some areas deemed important by teacher educators and others, perhaps teachers have little knowledge, and therefore do not recognize the relevance of these issues. Future inquiries should address the problem of figuring out how to change teachers' perceptions of what needs are relevant for the profession.

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Research Poster

2012 Southern Region AAAE Conference

An Investigation of Mathematics Coursework Requirements of Agricultural Teacher Education Programs

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An Investigation of Mathematics Coursework Requirements of Agricultural Teacher Education Programs

Introduction/Need for Research

In 1988, the National Research Council recommended that agricultural education should become more than just a vocational discipline, emphasizing the core academic aspects within agriculture. As a result, agriscience has been emphasized in numerous school-based agricultural education programs (Phipps, Osborne, Dyer, & Ball, 2008). With the growing emphasis on core academic connections, the mathematics requirements of agricultural teacher education programs "may need to be increased to meet the demands of interdisciplinary instruction" (Jansen & Thompson, 2008, p. 26). According to the Michigan State University Center for Research in Mathematics and Science Education (2010), preservice teachers in the United States receive weak preparation in mathematics and are ill-prepared to teach a demanding mathematics curriculum. Supporting the Michigan State University Center for Research in Mathematics and Science Education's claims, agricultural education research has shown that preservice agricultural education teachers are not proficient in mathematics (Miller & Gliem, 1996; Stripling & Roberts, 2011). Therefore, this study will further examine this issue by describing the mathematics coursework requirements of agricultural teacher education programs. Additionally, this study will describe the types of mathematics courses completed by preservice teachers.

Theoretical Framework

The theoretical framework for this study was Darling-Hammond and Bransford's (2005) "framework for understanding teaching and learning" (p. 11). In this framework Darling-Hammond and Bransford (2005) proposed three general areas of knowledge teachers should acquire: (a) "knowledge of learners and their development in social context" (p. 11), (b) "knowledge of subject matter and curriculum goals" (p. 11), and (c) "knowledge of teaching" (p. 11). This study focused on the knowledge of subject matter; more specifically, mathematics subject matter knowledge.

Methodology

This inquiry was part of a larger study that investigated the mathematics ability of the nation's preservice agricultural education teachers (Authors, in press). Based on the objectives of the larger study, agricultural teacher education programs were randomly selected until an adequate number of teacher education programs agreed to participate to meet the predetermined needed sample size of 89 preservice teachers. Israel (1992) indicated that a sample size of 89 was needed for a population of 800, a ±10% precision level, and a 95% confidence level. The population size of the nation's preservice agricultural education teachers was determined using Kantrovich's (2007) agricultural education supply and demand study. The random sample consisted of nine teacher education programs and 98 preservice agricultural education teachers, 61 females and 34

males (three preservice teachers did not provide this data). Data for this portion of the study, were collect using two surveys created by the researchers. The first survey required an agricultural teacher educator at the selected teacher education programs to provide their program's minimum mathematics coursework requirements. The second survey required all preservice teachers in the final year of the selected teacher education program to provide the mathematics courses they successfully completed in college. The types of mathematics courses required by the teacher education programs and the types of mathematics courses completed in college by the preservice teachers were categorized into basic, intermediate, and advanced mathematics by a mathematics expert. The mathematics expert categorized algebra, algebra II, college algebra, nature of mathematics, and math appreciation as basic mathematics, trigonometry, pre-calculus, and statistics as intermediate mathematics, and calculus as advanced mathematics.

Results

Sixty-seven percent of the agricultural teacher education programs in this study required basic mathematics coursework, and 33% required intermediate mathematics coursework. The actual types of course completed by the preservice teachers in college differed from the teacher education program minimum requirements. Forty-six percent of the preservice teachers completed a basic mathematics course as their highest mathematics course, 36% completed an intermediate mathematics course as their highest mathematics course, 15% completed an advanced mathematics course as their highest mathematics course, and 3% had not completed a mathematics course since high school. Also, 51% of preservice teachers completed courses at or above the intermediate level.

Conclusions

A majority of the agricultural teacher education programs in this study require basic mathematics as their minimum mathematics requirements, even though National Agriculture, Food and Natural Resources Career Cluster Content Standards (National Council for Agricultural Education, 2009) require agricultural educators to possess intermediate mathematical competencies. Additionally, preservice agriculture teachers are completing higher courses than are required by their teacher education program. Although, some preservice teachers have not completed a mathematics course since high school.

Implications/Recommendations

The results of this study suggest that agricultural teacher education programs may not be providing an adequate mathematics education for their preservice teachers. This conclusion is based on the fact that a majority of the programs in this study require mathematics coursework that is below the requirements of the national secondary agricultural education standards. This may negatively influence mathematics teaching in secondary classrooms and may prevent the agricultural education profession from answering the calls to emphasize core academic subjects. To that end, future research

should investigate the relationship between preservice teachers' mathematics proficiency and the types of mathematics courses completed by preservice teachers in college.

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Are They Competent? An Evaluation of University-Level Agriculture Students to Determine Levels of Agricultural Mechanics Knowledge

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Are They Competent? An Evaluation of University-Level Agriculture Students to Determine Levels of Agricultural Mechanics Knowledge

Introduction, Conceptual Framework, & Need for Research

Due to persistent demand from both students and the agriculture industry, the need exists for the continuation of agricultural mechanics education within secondary agriculture programs (Slusher, Robinson, & Edwards, 2011; Hubert & Leising, 2000). Industry desires that program graduates possess basic mechanical knowledge while students desire practical, real-world experiences and learning connections that can be found within the agricultural mechanics laboratory (Slusher, Robinson, & Edwards, 2011; Parr, 2004). To this end, agricultural mechanics coursework has been noted to be able to prepare students with challenging coursework that connects classroom theory with practical application (Parr, Edwards, & Leising, 2009).

Research (Saucier, McKim, & Tummons, 2011) has revealed that secondary agricultural educators should possess a basic set of agricultural mechanics knowledge sets. Agriculture teachers are expected to be able to properly manage agricultural mechanics laboratories and guide students throughout the learning process (McKim & Saucier, 2011). What is more, these teachers should be capable of solving complex agricultural mechanics problems and addressing students' skill and knowledge development needs (Burris, Robinson, & Terry, 2005). Concerns have been raised that pre-service agricultural educators lack the appropriate knowledge base to properly conduct agricultural mechanics curricula ((Burris, Robinson, & Terry, 2005). In keeping with these concerns, the following question has arisen within one agriculture teacher education program: Are selected pre-service agriculture teachers at [University] University prepared to meet chosen objectives through a comprehensive approach to agricultural mechanics education?

During the fall semester of each academic year, an agricultural education faculty member at [University] University teaches a course titled "Agricultural Structures and Metal Fabrication Technology" (CTCT 4140) that covers basic agricultural mechanics topics such as "carpentry, concrete, masonry, electricity, plumbing, and metal fabrication" ([University] University, 2011, p. 188). During this course, the agricultural mechanics knowledge base of the enrolled students is broadened through classroom and laboratory instruction. As a result, it is expected that by the end of the semester, each student will have been exposed to a broad overview of a variety of agricultural mechanics topics. Thus, the selected students should be competent in the understanding and application of basic principles of agricultural mechanics and should be prepared to properly implement and manage secondary agricultural mechanics curricula (Burris, Robinson, & Terry, 2005). The research conducted here has attempted to gather data concerning the preparation of agriculture teachers in agricultural mechanics knowledge development.

Objectives

The objectives of this research project were to:

1) Determine selected students' knowledge of agricultural mechanics as determined by a written examination.
2) Describe demographical characteristics of the selected students.
3) Determine if participants intend to pursue teaching as a career.

Methodology

In order to address this posit, researchers at [University] University contacted the Agricultural Mechanics Career Development Event (CDE) contest superintendent in [State] and request the written examination portion of the 2011 [State] State Agricultural Mechanics CDE and its answer key. This assessment consisted of one hundred questions that addressed a variety of agricultural mechanics topics that are taught within the secondary agricultural mechanics classroom ([State] FFA Association, 2009). Students enrolled within the CTCT 4140 course at [University] University (N=12) were selected to complete the examination and the aligned questionnaire during a scheduled class meeting. Upon completion of the exam, each test was graded by the researchers in accordance with the exam key used during the state CDE contest. The questionnaires were also evaluated to determine individual student traits in relation to group performance on the assessment.

Results

Within this population, twelve (N=12) university-level agriculture students at [University] University completed the questionnaires and the [State] FFA Agricultural Mechanics CDE written examination. Within this particular population, the average written exam score was 47.1% correct with scores ranging from 29% correct to 58% correct, indicating a wide variability in student performance and agricultural mechanics knowledge on this examination. A detailed explanation of the questionnaire results is given in the table below.

Table 1. *Selected demographics of university-level agriculture students enrolled in the Agricultural Structures & Metal Fabrication Technology course at [University] University.*

What is your major?	Agricultural Education: N=10; Horticulture: N=1; Undeclared: N=1
What is your current class standing?	Freshman: N=0; Sophomore: N=3; Junior: N= 6; Senior: N=3
What is your gender?	Male: N=11; Female: N=1
Do you intend to pursue teaching as a career?	Yes: N=12; No: N=0
Did you take an agricultural mechanics course in high school?	Yes: N=4; No: N=8
Did you compete in either the Agricultural Mechanics CDE or the Agricultural Construction & Maintenance CDE in high school?	Yes: N=4; No: N=8
If so, which one?	Agricultural Mechanics CDE: N=3; Agricultural Construction & Maintenance: N=1

Conclusions/Implications

The results of this examination session indicate that this population of students, while all desire to teach secondary agricultural education, may not prepared to successfully teach the wide variety of topics commonly found within the agricultural mechanics curriculum. It is interesting to note that most of these students had neither

prior agricultural mechanics coursework nor had competed in either of the selected CDEs during their high school years. Thus, this course (CTCT 4140) has become this population's primary preparation method through which to learn and eventually teach secondary agricultural mechanics. Further research should be done with this population to determine what agricultural mechanics knowledge deficiencies need to be addressed through agricultural mechanics coursework. Also, perhaps this university should consider the development of additional agricultural mechanics courses to provide additional development to students enrolled in agricultural education courses at [University] University.

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Battle of the Sexes: Classroom Management amongPreservice Teachers in Agriculture Education

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Battle of the Sexes: Classroom Management among Preservice Teachers in Agriculture Education

Introduction/Need for Research

Trust in the American educational system has been in question. (Satterthwaitet, Piper, Sikes, & Webster, 2011). Parents hold the belief that today's schools fail to adequately prepare students for life beyond the classroom (2011). This belief is passed on to their children who develop an apathetic attitude towards school, and more specifically the teacher. This lack of caring and disrespect quickly leads to discipline problems in the classroom (Moore, 2010).

As the traditional relationship of trust and respect between student and teacher grows more distant and strained, discipline problems increase (Philip, 2009). These increased discipline problems are attributed to many causes besides this faltering relationship. Some causes include: inadequate discipline training in new teachers; less authoritative strategies of classroom discipline; and lack of discipline from parents at home (Erdogran, et al., 2010). Although numerous reasons are being posited for unsatisfactory discipline, people see the teacher as one of the primary factors (Baker, Grant, & Morlock, 2008).

Teachers throughout the United States report varying numbers of discipline problems each year (National Center for Education Statistics, 2010). Gender differences among teachers are a strong factor for the differentiation in number of discipline problems. (Krieg, 2005: Panko-Stilmock, 1996) The 1996 study reports that female teachers frequently have more discipline issues. Agricultural education, a field composed primarily of men, is noticing an increase of female teachers (Kantrovich, 2010). In order to grow as professionals, the varying in occurrence and type of discipline issues in response to teacher gender should be investigated.

Methodology

To describe the discipline issues among male and female secondary agriculture pre-service teachers, a questionnaire was distributed to the spring 2011 student teachers (N= 16) at the University of [STATE]. The questionnaire consisted of nine multiple choice questions that individually sought to describe disciplinary issues encountered during the student teaching placement. The questionnaire was completed following the student teaching semester. The questionnaire reflected personal classroom management issues as defined by research (Wolf, Foster & Birkenholz, 2009). A panel of experts (n= 5) examined the questionnaire for content and face validity. Construct validity was determined through a thorough review of literature on classroom management. Findings were reported by frequencies and percentages.

Conceptual Framework

For this research, game theory (Myerson, 1991) was selected. This theory studies mathematical models of conflict and cooperation between rational decision makers. In addition, it helps to offer insight into the relation of mathematics and social sciences. Also called conflict analysis, Game Theory proposes that there is more involved in conflict than pure coincidence (Osborne, 2004).

Results/Findings

The researchers received a 75% response rate (n =12)*;* equally representing each gender: male (n = 6) and female (n = 6).From the results, the majority of participants, both male and female, responded that their cooperating teachers started in the classroom and transitioned out (f=7; 58%). When asked the frequency of classroom interruptions, the highest percentage of males (f=4; 66%) reported that the cooperating teacher rarely interrupted to assist with discipline while females (f=4; 66%) reported never being interrupted by the cooperating teacher. All males participant (f=6; 100%) reportedhaving one to three discipline issues per day, while most females (f=4; 66%) reported having four to six discipline issues per day. Of the discipline issues reported, half of the males (f=3; 50%) distributed one to two discipline referrals per week, while the majority of females (f=4; 66%)no discipline referrals were written. Following a discipline referral, most males (f=4; 66%) reported having no student confrontation, but the largest number of females (f=4; 66%) responded having student confrontation one to three times, on average. When asked about administrator assistance needed for discipline, only one male (f=1; 12%) reported needing the assistance compared to half of the females (f=3; 50%).

Conclusion/Implications/Recommendations

The collected data shows evidence of stratification between male and female teachers'classroom management techniques in agriculture education. The trend displays a higher number of discipline issues with regard to female teachers, although the survey did not uncover underlying reasons. It is possible to reason that the dissimilarities could be due to personality differences between the genders, as well as attitude and philosophy of the individual cooperating teachers. It is recommended that additional research explore to see if similar findings exist. A survey of the twelve cooperating teachers would provide additional data and help answer some uncertainties of the initial survey. Much of the data gathered from the survey may be related. However, without further concrete findings, all assumptions that could mad may not be accurate.

While much can be speculated about the data, it is recommended that further research expand to examine agriculture teachers throughout the country, at the preservice level, novice teaching level, and experienced level. Research should further explore if a correlation exists, within classroom discipline, between teacher and student genders. A qualitative examination is recommended that examines disciplinarystrategiesof preservice student teachers. Finding answers to these questions, as well as a larger number of responses, can further explainthe gap in discipline issues experienced by male and female teachers.

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Birds of a feather: Examining youth personality styles in the [STATE] FFA Association

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Birds of a feather: Examining youth personality styles in the [STATE] FFA Association

Introduction/Need for Research

Schools, churches, organizations, and corporations consist of a complex and diverse set of personalities. Differences in personalities have served beneficial in the growth and expansion of major corporations (Wheeler, Richey, Tokkman, & Sablynski, 2006). Personality research is not a new concept. Within agriculture alone, research of personality types has been conducted in extension (Davis, 2006), among administrators (Earnest & McCaslin, 1994), of preservice teachers (Raven, Cano, Garton, & Shelhamer, 1993) and of secondary classroom teachers (Roberts, Harlin, & Briers, 2003).

Maintaining diversity in personality is sometimes difficult when individuals of like organizations or institutions are evaluated. While comparing personality types among a student and teacher population, Barrett (1985) found that most collegiate agricultural student personalities gravitated toward certain characteristic types. Using the Myers-Briggs Personality Type Indicator (MBTI), 75% of the 413 students enrolled in the College of Agriculture at the University of Nebraska were extroverts; whereas, 25% were introverts (1985). More recently, MacLellan (2011) found that the members of a high school band, orchestra, and choir had the same personality types within each group using the MBTI. Tatum (1999) found that students tend to associate with other students that share the same support system and come from the same community as themselves. In addition, people stay in their comfort zone and associate with those of similar personalities and interests (Tatum, 1999). Together, these findings bring inquiry if students are drawn to group dynamics beyond content similarities, but that of personality.

Is there a need for concern in the homogenous of personalities among the same group? One study explains that groups of similar personalities limit the complexity of creativity and higher quality decision making (Robbins, 2001). Schools and youth organizations represent a wide range of personalities. But in a study of accounting students, it was discovered that students who excelled shared similar personality characteristics (Kovar, Ott, & Fisher, 2003). Agricultural education promotes and encourages diversity not only in ethnicity, but in thought as well, and provides a universal common denominator, agriculture (Talbert & Edwin, 2008). However, if homogenous personality implies requisites for advancing in academia, does a personality need to be similar in order to obtain leadership roles in a youth organization?

Conceptual/Theoretical Framework

This study was guided by the foundations of the theory, homophily. According to McPherson, Smith-Lovin, and Cook (2001), “homophily is that principal contact between similar people occurs at a higher rate than among dissimilar people” (p. 416). Homophily can be divided into two distinct categories: status and value. Status homophily encompasses traits shared such as race, ethnicity, sex and age whereas value homophily is described as the values and beliefs that a person holds thereby affecting

their behavior (McPherson, Smith-Lovin, & Cook, 2001). Through the lens of this theory, the researchers are seeking to determine if homophily exists within the personality types of [STATE]'s leadership in an agricultural education affiliated youth organization.

Methodology

To assess personality styles among youth leadership, regionally elected officers from the [STATE] FFA Association were evaluated (n = 54). An instrument containing two parts was distributed. The first part acquired demographic information; the second part consisted of the Keirsey Temperament Sorter II (Keirsey, 1998), also referred to as KTS. Similar to the Myers-Briggs, the KTS examines human behavior – by providing the appropriate dichotomies, but differs by categorizing personality types into four temperament groups: artisan, guardian, rational, and idealist. Through previous research the KTS was determined reliable (Keirsey, 1998). A panel of experts (n = 4) examined the questionnaire for face and content validity. This study was conducted in September of 2011 at a leadership conference for FFA members who were currently serving a leadership role at the regional level in [STATE]. The conference provided a convenient cluster sample of the population (N = 76). Through SPSS 19.0, measures of frequencies and percentages were calculated.

Results/Findings

From the analysis, the majority of [STATE] FFA regional youth officers, the majority (f = 47; 87%) had an expressive/attentive personality labeled as extroversion. Of the participants, the majority (f = 45; 83%) represented sensing as their observant/introspective character type. Over half of the regional officers (f = 29; 53.7%) fell into the feeling category in the tough-minded/friendly personality. When scheduled/probing was calculated the majority of the respondents (f = 44; 81.5%) were classified as judging rather than perceiving. Collectively, those four factors determined that the majority (f = 36; 66.7%) of [STATE] FFA regional officers held a guardian personality followed by undetermined (f = 11; 20.4%), idealist (f = 4; 7.4%), and artisan (f = 3; 5.6%).

Conclusions/Implications/Recommendations

The majority of the participants were extroverts, signifying homophily exist within the regional leadership ranks. The existence of homophily implies a bias exists toward types of students chosen for leadership positions. In the current election process, extroverts are chosen far more frequently than introverted students suggesting it is more difficult for introverted students to be elected. In addition, students favored the traits of sensing, feeling, and judging which classified the majority of students as Guardians which is further evidence that homophily exists This leadership style represents a supervisor, inspector, provider, or protector (Keirsey, 1998 Since these characteristics represent qualities representative of a teacher (Arnon & Reichel, 2007), it is recommended that teacher educators in [STATE] place effort in encouraging the youth leaders to pursue a career in agricultural education. Another implication from the findings is that only certain personality characteristics are electable within the youth

organization. It is recommended that teachers be more cognizant to other personality characteristics and encourage students of diverse personalities to obtain a leadership position. Overall, these findings conclude that the selection of student leadership caters to one personality type more than others. It is recommended the [STATE] FFA Association create a system that welcomes the needs of all students to allow for leadership to be more reflective of the personality traits within the organization.

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Characteristics of Effective Cooperating Teachers: Teachers' Perceptions

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Characteristics of Effective Cooperating Teachers: Teachers' Perceptions

Introduction/Need for Research

The student teaching experience has been noted by many researchers (Glenn, 2006; Koerner, Rust, & Baumgartner, 2002; Guyton & McIntyre, 1990) as one of the most critical components of the teacher preparation program. Therefore, "the selection of qualified cooperating teachers with whom these students will work is accordingly imperative" (Glenn, 2006, p. 1). Given this knowledge of the student teaching experience, it is discouraging to know that the criteria used to select cooperating teachers is usually unrelated to the goals of the teacher education program (Copas, 1984).

The purpose of this study was to continue to develop the model of cooperating teacher effectiveness developed by Roberts (2006). This purpose aligns with the *National Research Agenda for Agricultural Education and Communication* (Doerfert, 2011). The study supports research priority areas for meaningful, engaged learning in all environments which include "examining various meaningful learning environments in assorted agricultural education contexts for their impact on specific cognitive, affective, and psychomotor learning outcomes." (p. 9). In order to do develop a better understanding of effective cooperating teachers, agriscience teachers in <State> and <State> were used in this investigation.

Framework

The theoretical framework for this study is grounded in cognitive skill psychology (Hobson, 2002). Student teachers develop and refine their skills in the classroom through the application of their training with the assistance of their cooperating teacher. The cooperating teacher takes on the role of "mentor" or "coach" to provide support and guidance for the student teacher. This notion is supported by Vygotskys's social learning theory and that scaffolding needs to be provided by more competent peers or adults (Slavin, 2009).

Methodology

This project used the Delphi method (Linstone & Turoff, 1975) to collect data about what characteristics are essential to being an effective cooperating teacher. Two distinct phases were used to establish the panel of experts and develop a consensus of essential characteristics. Skulmoski, Hartman, & Krahn (2007) identified the selection of participants as one of the most important components of the Delphi because their opinions are what all conclusions are based upon. To develop the two expert panels, all agriscience teachers in each state were asked during the spring of 2009, via email, to submit the names of 1-3 teachers that they believe to be expert cooperating teachers. In <State> 202 of 543 teachers responded (37%), which resulted in an expert panel of 17 teachers. The response rate in <State> was 20% with 328 of 1606 teacher responding, resulting in 16 teachers on the expert panel.

The data collection in each state began in 2010 with the first round of the Delphi. Qualtrics, a web based survey tool, was used to conduct this phase of the study. Teachers were asked to identify as many characteristics as they felt were necessary to be an

effective cooperating teacher. Subsequent rounds were used to reach a consensus among each expert panel about what characteristics should be included.

Results/Findings

For the first round of the study <State> had a response rate of 94% (n = 15) and <State> had a response rate of 73% (n = 11). <State> teachers generated 121 items while the list for <State> contained 85 items. During the second round similar and duplicate items were combined while compound statements were separated and then returned to the panel. Participants were asked to rate each characteristic identified with round one on a six point Likert scale (1 = Strongly Disagree to 6 = Strongly Agree). It was decided *a priori* that items with a mean less than 4.8 would be removed. This resulted in 37 items from <State> teachers and 36 items from <State> teachers. The final round asked participants to indicate whether they agree or disagree that each characteristic should be included on the final list; characteristics receiving less than 80% agreement were eliminated. This resulted in a final list of 36 characteristics in <State> and 34 characteristics in <State>. The list was then grouped according to Roberts (2006) model of cooperating teacher effectiveness. Figure 1 displays items that were identified by both expert panels. It is important to note that the Teaching/Instruction category had no shared characteristics.

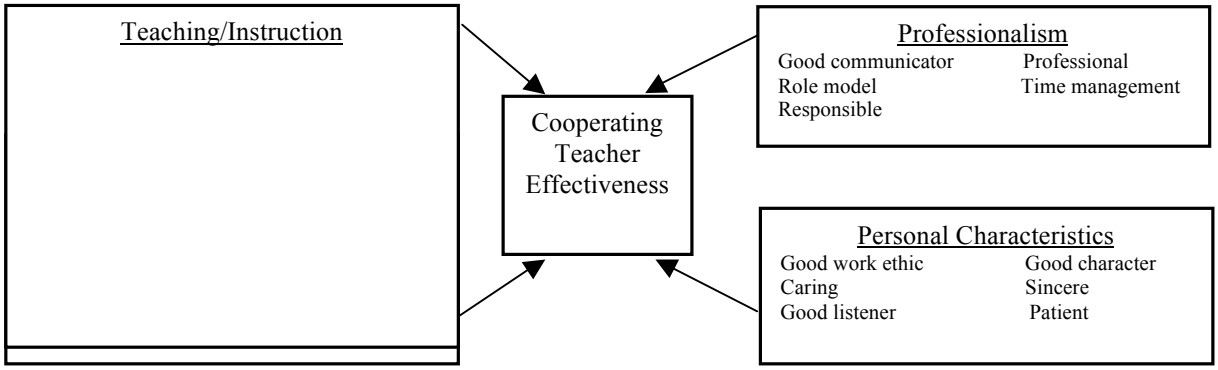

Figure 1. Model of cooperating teacher effectiveness. Adapted from Roberts (2006).

Conclusions/Implications/Recommendations

This study found that the overall model of cooperating teacher effectiveness proposed by Roberts (2006) is supported by the perceptions of agriscience teachers in <State> and <State>. However, variation was seen among the unique characteristics that describe each category. One possible explanation for this might be that the cooperating teachers see a very different side of the dynamic relationship between the student teacher, cooperating teacher, university supervisor and the students at their teaching site. In Roberts (2006) and Roberts and Dyer (2004) student teachers put more emphasis on the Teaching/Instruction component of the model than the cooperating teachers. Zeichner (2002) suggests that being a good classroom teacher is not synonymous with being a good cooperating teacher, which might be reflected in the characteristics identified in this study. Enz and Cook (1992) recommended that cooperating teacher be selected for their ability to be effective mentors, which further supports the emphasis cooperating teachers placed on personal and relationship characteristics. Further research should be conducted

to evaluate the characteristics of effective cooperating teachers through the lens of the university supervisors. This study should also be replicated in other states to further explore the differences among cooperating teachers. The characteristics identified by this study and Roberts (2006) could also be used with a much larger sample to determine if cooperating teacher and student teachers agree on which characteristics are most important.

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Poster Type: Research

Cooperating Teachers' Perceptions of the Commitment Level and Competencies of Student Teachers

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Cooperating Teachers' Perceptions of the Commitment Level and Competencies of Student Teachers

Introduction

The student teaching semester is very important in determining the success of the student and impacts their decision to enter the profession (Deeds, Flowers, & Arrington, 1991; Grimmett & Ratlaff, 1986; Norris, Larke, & Briers, 1990; Schumacher & Johnson, 1990; Schuman, 1969). Efforts have been made to improve the student teaching semester and the interaction between student teachers and cooperating teachers (Bacharach, Heck, & Dahlberg, 2010; Hamman, Olivarez Jr., Lesley, Button, Chan, Griffith, & Elliot, 2010). One way the interaction may be improved is through implementation of the Situational Leadership Model (Hersey & Blanchard, 1969) in training and practice. The model suggests that leaders must identify the development level of their followers and modify their leadership style to meet the related needs.

The *Research Agenda for Agricultural Education & Communications* recognizes this need with the research priority area of "defining the characteristics of effective agricultural education programs and teachers" (Doerfert, n.d., p. 10). The purpose of this research was to determine cooperating teachers' perceptions of their previous student teachers' level of commitment and the essential competencies needed by student teachers. The following questions guided the research: 1) How do you determine a student teacher's level of commitment? and
2) What competencies should student teachers have when they enter their student teaching experience?

Conceptual Framework

The Situational Leadership Model developed by Hersey & Blanchard (1969) states that the leader should modify their leadership style to meet the developmental needs of their followers. The follower's developmental level varies based on their commitment and competence on specific tasks (Northouse, 2010). As followers become more confident, motivated, and knowledgeable on particular tasks they are able to move from D1 (low development) to D4 (high development). The leader must be able to assess the developmental level of the follower in order to match their leadership style to the follower. Moreover, an instrument is needed to allow cooperating teachers to more accurately assess student teachers' development level on specific tasks, rather than overall competency, so that leadership style may be matched to developmental needs on a task-specific basis.

Methodology

The population for this study was a purposive sample of agriscience teachers identified as potential cooperating teachers for the 2011-2012 school year. A list of 33 agricultural education teachers within 100 miles of the university were selected and sent an invitation to attend. Thirteen agricultural education teachers attended the workshop and participated in the focus group session.

Focus group interviews allow for a discussion on a certain topic among a group of selected people (Glesne, 2011). They "allow for group interaction and greater insight" (Krueger, 1994, p. 3) on certain topics and thoughts. Krueger states, "focus groups can improve the planning and design of new programs" (1994, p. 3). Two primary questions were posed, with probing questions asked during the discussion period. Teachers were first asked, "How do you determine a student teacher's level of commitment?" Secondly, teachers were asked, "What competencies should student teachers have when they enter their student teaching experience?" Responses to each of the questions were captured and used to compile a list of commitment indicators and needed competencies.

Findings/Conclusions

The focus group participants consisted of 13 teachers who attended a Cooperating Teacher Workshop sponsored by {State} University. All of the participants were male (100%) and the majority (76.9%) had five years or more of teaching experience. Ten (76.9%) of the participants had served as a cooperating teacher at least once prior to attending the workshop.

When cooperating teachers were asked the question, "How do you determine the commitment level of your student teacher?" the discussion revealed a list of 10 key identifiers. They are: Take initiative/advantage of all opportunities, arriving early/punctual, willing to stay late, are not apprehensive, willing to learn/take on challenge (want to go, do, and learn), have identified goals, want to teach after graduation, general first impressions, non-verbal reactions (especially to new experiences), go out of their way to be there and do a good job.

The discussion regarding the question, "What competencies should student teachers have when entering the high school classroom?" resulted in agreement on 12 competencies. Those included: People skills (faculty, administration, parents, students, community), knowledge of the difference between being a teacher and being a friend to the students, adaptability /flexibility, classroom management, accepting of available facilities, mindset of a teacher/professionalism, maturity, knowledge of how to promote program, lesson plans and planning (content and structure), an understanding of timing and the student engagement associated (50 min or 90 min), grasp on instructional methods besides lecture, general FFA knowledge.

There were two competencies that were identified as having either a negative impact or no impact on the student teacher's ability to perform. The first was, "overconfidence" in connection to student teachers thinking they are experts on a certain subject, but are unable to teach it effectively. Teachers recommended that the cooperating teacher be patient when explaining new skills to the student teacher. Better training is needed to enable student teachers to transfer their knowledge to the high school students.

"Knowledge of livestock selection and showing" was a competency that the teachers did not feel was necessary for student teachers, which was surprising due to the regional area that was represented.

Implications/Recommendations

There are several recommendations that arose from this focus group. First, researchers should continue to ask cooperating teachers about the competencies and commitment

levels of their student teachers. Also, cooperating teachers want to know how to better work with student teachers and workshops should be developed to meet this need. Finally, an instrument to assess the developmental level of student teachers should be developed and pilot tested from the information that was gathered from this focus group. This instrument may help diagnose what developmental level the student teacher is in for each competency, therefore providing cooperating teachers more information on how to meet the developmental needs of their student teacher.

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Critical Thinking Dispositions of Georgia Agricultural Educators

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Critical Thinking Dispositions of [State] Agricultural Educators

Introduction/Need for research

The National Research Agenda (NRA) emphasizes the need for skilled, educated workers to provide solutions to challenges and issues facing the agricultural industry (Doerfert, 2011). These issues involve situations where there are no clear-cut answers. The NRA identifies topics regarding food safety, food insecurity, classroom integration of Science, Technology, Engineering, and Math, effective education programs, and sustainable growth. The solutions to these problems will necessitate analyzing, reasoning, open-mindedness, and innovation. To heed the opportunity to respond to these challenges requires critical thought. State standards require teachers to develop critical thinking abilities among their students (Soule, 2006); however, if students learn by seeing and modeling behaviors (Tishman, Jay & Perkins, 1993), what are agricultural educators inclined to demonstrate regarding critical thinking? The need for research is based on two premises. First, according to the National Research Agenda, addressing the development and assessment of problem-solving, transfer of learning, and higher order thinking across agricultural education is a priority research area (Doerfert, 2011). Second, assessing effective agricultural education programs includes teacher assessment. Tishman et al. (1993) suggest that we must first know the educators' critical thinking dispositions to determine the effectiveness of their critical thinking teaching strategies. The purpose of this quantitative study was to describe the critical thinking dispositions of selected agriculture teachers in [State]. Additional research questions were designed to determine to what extent the following variables were related to critical thinking dispositions among agriculture teachers in [State]: age, gender, route of certification and preferred teaching method.

Conceptual Framework

Researchers suggest that critical thinking disposition, the inclination, or willingness to use critical thinking skills may be related to student success (Dewey, 1930; Ennis, 1996; Facione & Facione, 1992; Nieto & Saiz, 2011). Perkins, Jay, and Tishman's (1993) dispositional theory model offers a dispositional triad indicating that an individual has to notice when a situation calls for critical thinking skills, know which skills to use and have the ability to use those skills. Additionally, the Tishman et al. model of enculturation posits that it is imperative teachers show students their critical thinking habits, provide examples, and create teacher-student interactions involving the disposition. If a teacher has a high disposition for critical thinking, he or she will be more inclined to utilize critical thinking skills, thereby exposing students to the application of critical thinking (Ricketts, 2003). If the disposition is low, he or she will provide less of a working demonstration of when and how critical thinking skills can be applied. Based on Facione's (1990) tradition, researchers at the [University] developed the Engagement, Maturity, and Innovativeness (EMI) assessment, a refined tool to measure critical thinking dispositions (Irani, Rudd, Gallo, Ricketts, Friedel & Rhoades, 2007). This study simultaneously builds on the EMI framework and the critical thinking disposition knowledge base as it represents pilot data for a larger study seeking to identify relationships between dispositions and teaching methods.

Methodology

A convenience sample of agriculture teachers (n=50) were selected from the [State] Agricultural Educator directory and an email was sent to each teacher asking for his or her participation in this pilot study. The email provided a link to the anonymous online questionnaire and encouraged participants to respond within two weeks. No reminder emails were sent. The body of the email served as the "Consent Form" and their acceptance was assumed by clicking on the link to submit their responses. The 26 items of the EMI, followed by five demographic questions, were accessed through SurveyMonkey™. Respondents rated whether they possessed the indicated characteristics using a four-item summated rating scale: 1 representing "Strongly Disagree" and 4 representing "Strongly Agree." The EMI assigns a score from 11 to 44 for engagement, 8 to 32 for cognitive maturity and 7 to 28 for innovativeness. The total possible range is 26 – 104 (Irani et al., 2007). A person scoring high for engagement would be characterized as being predisposed to look for, anticipate and be confident with situations requiring reasoning; a high disposition for cognitive maturity would be characterized as being predisposed to be open-minded and aware of biases and the complexity of problems; and a high score for innovation would reflect an individual who is predisposed to be intellectually curious and to seek the truth (Ricketts, 2003). Cronbach's alpha =0.83 was calculated for the instrument. Data were analyzed with PASW Statistics 17.0.3 using descriptive statistics, independent samples t-test and Analysis of Variance.

Results

Forty-eight respondents represents a 96% response rate with half (n=24) of the respondents being male. The majority of the participants received their agricultural education certification through a four-year university (n=39) and were in the age range of 21-29 (n=31). Group work and lab experiences were favored (40% and 37%, respectively) over direct instruction and inquiry based teaching methods. The mean critical thinking disposition scores of selected agriculture teachers in [State] were 32.8 for the engagement construct, 23.75 for cognitive maturity and 21.3 for innovativeness. Total EMI critical thinking disposition scores ranged from 65 to 93, with an average score of M = 77.83, SD = 6.90. There were no significant differences between age groups, gender, or preferred teaching methods of [State] agriculture teachers and their critical thinking dispositions. However, there was a significant difference in the scores for [State] agriculture teachers who were traditionally certified through a 4-year degree program (M=77 SD=6.3) and those alternatively certified (M=83, SD=8.7); $t(46)$= -2.1, p = .042.

Conclusions

Based on the data, selected agriculture teachers in [State] have moderate critical thinking dispositions, with engagement being the strongest disposition. Age, gender, and preferred teaching methods do not impact critical thinking dispositions of selected agriculture teachers in [State]. Teachers who were certified through alternative methods had a higher critical thinking disposition than those certified through a 4-year degree program.

Recommendations

Although this pilot study should not be generalized, results indicate that it would be beneficial to provide training for teachers to further develop their dispositions and demonstrate enculturation methods. This study should be replicated with a larger, randomized sample to validate results. Also, in the follow-up to the pilot, teachers' critical thinking dispositions should be examined to see how they influence teaching strategies. Lastly, an investigation of how years of teaching experience relate to critical thinking dispositions may provide insight to the difference between those alternatively certified and those traditionally certified.

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Destination Critical Thinking: Differences in Critical Thinking in Pre and Reflection Exercises from International Travel

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Introduction

In 2004, higher education associations and leaders of institutional accrediting bodies decided that critical thinking was one of the six major intellectual and practical skills students should leave their undergraduate time with (AAC&U, 2004). Without the correct concepts and perceptions of critical thinking, the teacher may believe they are encouraging or teaching critical thinking when they are not. This study was developed to determine the difference in critical thinking skills from pre and reflection exercises of faculty, before and after an international trip. If faculty are not able to think critically, how can higher education institutions expect the skills to be portrayed to undergraduates?

In an effort to increase the international experience of faculty the USDA has funded the Teaching Locally, Engaging Globally (TLEG) project. The first phase of the TLEG project provided teaching faculty from three land-grant universities with funding to travel internationally to locations in Latin America and the Caribbean. Part of this project included having faculty complete preflections and reflections based on their beliefs and experiences of traveling to Latin America.

Conceptual Framework

Critical thinking is defined by Facione (1990) as "purposeful, self-regulatory judgment, which results in interpretation, analysis, evaluation, and inference, as well as explanation of evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based." Critical thinking is not second nature, it is something that is taught and cultivated throughout a person's life. In the case of agricultural education, critical thinking requires a framework that includes skills, dispositions, and knowledge (Rhoades, et al., 2004). Facione (1990) adds to these citing interpretation, analysis, evaluation, inference, explanation, and self-regulation. Adding all of these together provides an almost all encompassing framework for understanding critical thinking. Every educator claims to foster and utilize critical thinking in the classroom (Rhoades, et al., 2008).

Methodology

This study was conducted using a basic qualitative research design (Merriam, 1998). Participants in this study ($N = 8$) were faculty at the university, representing a variety of different departments within the university. Participants were selected based on their interest to learn about Latin America and internationalize their courses.

In July 2010, three weeks prior to departure, each participant was asked via e-mail to complete a preflection in order to identify pre-existing attitudes, beliefs, and expectations regarding both the trip and the cultures that would be encountered. The preflection exercise consisted of four open-ended questions which asked participants to identify initial attitudes and beliefs about the experience and anticipated gains from the experience.

The same type of exercise was done after the trip as a reflection exercise. The reflection exercise consisted of nine open-ended questions which asked participants to identify post-experience attitudes and any comments on how the experience would help or hinder their future endeavors.

The constant comparative method of data analysis was used to sort the data from the preflection and reflection exercises into emergent themes (Lincoln & Guba, 1985). Within the constant comparative method, bits of data are compared to others in order to identify similarities and differences which may be present (Merriam, 1998). The data were independently coded by two of the researchers, who then confirmed or revised their initial findings using procedures outlined by Lincoln and Guba (1985).

Results

Preflection Exercise

Participants were asked to explore the attitudes and beliefs they had prior to visiting Latin America. Researchers found that the level of critical thinking in the preflections was very low. Participants made very basic, blanket statements with no reasoning about their beliefs such as, "strong ethnic and gender inequalities are likely to be evident." Other findings included broad statements with little backing such as, "there are strong economic disparities among the population with any particular country." Some statements were geographically stereotypical and/or based on second hand information, such as, "I have many friends who have visited…there are stories of poverty…"

Reflection Exercise

Participants were asked to explore the attitudes and beliefs they had after visiting Latin America. Researchers found that the level of critical thinking was much higher than the preflection level. Participants were descriptive and specific in their statements. The sheer quantity of writing showed that there was more critical thinking done. Participants also gave firsthand accounts followed with ideas of why they believed such things. Such statements include, "Ecuador seems to be stable…WE saw evidence of …I believe this is the case because…"

Conclusions

Researchers concluded that participants had a much higher level of critical thinking the reflection than in the preflection. Allowing participants to reflect on their preflection along with their experience seemed to increase critical thinking. Participants were much more descriptive and delved deeper into reasons and ideas of why they had certain beliefs and attitudes. Reflection is a great tool to encourage critical thinking. Encouraging faculty members to reflect and think more critically about experiences will in turn, encourage student critical thinking also.

Recommendations/Implications

Reflection is a great tool to encourage critical thinking. Encouraging faculty members to reflect and think more critically about experiences will in turn, encourage student critical thinking also. Recommendations include more research on differences in pre and reflection work. Determining the differences may allow educators to see how important critical thinking is and in turn, encourage more critical thinking in students via the educator.

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Research Poster Proposal

Determining Middle School Teachers' Knowledge of [state] Performance Standards

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Determining Middle School Teachers' Knowledge of [state] Performance Standards

Introduction

The number of middle school agricultural education programs continues to increase as school districts across the country see the many advantages of the curriculum and the impact programs and FFA chapters have on students in grades 6-8. One could argue that the agricultural education curriculum can positively impact students' understanding of a myriad of concepts related to math, science, social studies, and the arts.

Currently, [state] has over 70 middle schools with programs that explore agriculture and related careers using the "Total Program" model. The agricultural education program on the middle school level keeps students interested in learning, provides real-life connections in the classroom and laboratory experiences, and promotes the idea that success in the future starts now (Gibbs, 2005, p 7). In addition to agricultural literacy and career exploration, research has proven that middle school agricultural education curriculum can create an interest in science and aid students in performing at a higher level on state mandated examinations. According to Stevens, Duncan, Navarro and Ricketts (2009), the percentage of students meeting or exceeding the standards in science on the Criterion-Referenced Competency Test (CRCT) test were consistently higher (and sometimes significantly higher) in schools with agricultural education programs during two consecutive school years. "The CRCT program is designed to measure student acquisition of the knowledge, concepts, and skills set forth in the state curriculum. The testing program serves a dual purpose: 1) diagnosis of individual student and program strengths and weaknesses as related to instruction of the [state] Performance Standards, and 2) a measure of the quality of education in the state" (Cox, 2007, p. 3).

On the local level, how informed are middle school teachers (academic) on the performance standards for agricultural education? More importantly, do academic teachers see the connection between their curriculum and that of the agricultural education program? Can the agricultural education curriculum reinforce topics in science, math, social studies and language arts? One local school system sought to answer a cadre of questions in order to better understand academic teachers' knowledge of [state] performance standards and determine methods to be used to strengthen collaboration between teachers.

Methodology

The middle school agricultural education teacher at Screven County, [state] middle school sought to assess middle school teachers' knowledge of the [state] agricultural education standards and the agricultural education curriculum. The teacher developed an on-line survey consisting of seven yes/no questions and one open-ended question. Teachers were invited to participate in this study. Forty-one teachers participated in this study.

Results

Results showed that 41 (100%) of the teachers were aware of the agricultural education program and 35 (85%) were aware of the [state] performance standards for agricultural education. Of those who were aware of the standards, only 8 (23%) had examined the standards. All 41 teachers believed that student achievement would increase if topics presented in academic classes were reinforced in enrichment (agricultural education) classes. Additionally, 38 (93%) teachers said they would utilize agriculture classes to help reinforce standards taught in their academic classes, but only seven (17%) indicated they had sought help from the agriculture education department to reinforce a topic presented in your class.

As an outcome of this study, the agricultural education teacher chose to be proactive and address the issues highlighted in the results by building a three step program. First, the agricultural education teacher coordinated a meeting to share the [state] agricultural education standards with teachers representing each academic department, and collect standards from each department head. Teachers were asked to review the agricultural education standards and determine if there was overlapping curriculum.

Second, the agricultural education teacher organized a second meeting where teachers brought back specific academic concepts they felt the agriculture department should cover in order to assist their students in understanding a cadre of topics. The agricultural education teacher developed a series of new lesson plans that reflected the academic teachers' need areas. The following are specific examples: 6th Grade Math: Perimeter, volume & area; 8th Grade Math: Probability; 6th Grade Science: Properties of the soil; 8th Grade Science: Electricity; 7th Grade ELA: Sentence structure; and 7th Grade Science: Animal cells.

Third, the agricultural education teacher developed the "weakest link" program. As part of the program a blog was created that allowed the academic teachers to post specific areas their students were struggling in each week. With this knowledge all teachers were able to collaborate and assist their students with challenging content.

Conclusions/Recommendations

Results from this study indicate that the majority of teachers at Screven County, [state] middle school are aware of the [state] performance standards for agricultural education but less than 25% had examined the standards. It is encouraging to note that 93% of the teachers indicated they would utilize agricultural education classes to help reinforce standards taught in academic classes. One should also note that academic teachers were interested in collaborating with the agricultural education teacher and took the time to pair standards and provide specific examples where their students were struggling (i.e. math and science concepts specific to each grade level).

The researcher recommends that middle and high school agricultural education teachers develop similar collaborative efforts with academic teachers and administrators as to ascertain the knowledge level of state and national standards so all educators can work

more closely to serve the needs of the students. By understanding the knowledge base of teachers and creating a seamless channel of communication (i.e. Blog), teachers are able to identify content students are struggling with and determine which departments can collaborate to resolve student deficiencies in a timely manner. It is also recommended that teachers develop support groups between grade levels and the agricultural education department. This would also assist teachers in identifying where students are struggling and enable teachers to pinpoint which department(s) has the resources to meet the students' needs.

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Research Poster

Enhancing Teaching and Internationalization of Curricula in Agricultural Education through the use of RLOs: Faculty Perceptions and Best Practices

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Enhancing Teaching and Internationalization of Curricula in Agricultural Education through the use of RLOs: Faculty Perceptions and Best Practices

Introduction/Need for Research

Educators across the field of agricultural education continue to strive to improve the educational experience through methods such as students' oral verbalization (Pate & Miller, 2011), inquiry-based instruction (Thoron, Myers, & Abrams, 2011), experiential learning (Wulff-Risner & Stewart, 1997), and more recently through the use of reusable learning objects. A reusable learning object (RLO) is something that many researchers agree is a learning object that can come in all shapes and forms (Downes, 2001; Farha, 2009; Muzio, Heins, & Mundell, 2002; Polsani, 2003). RLOs are "generally understood to be digital and multimedia-based, which can be reused and – in some cases – combined with other learning objects to form larger pieces of instruction" (Farha, 2009, p. 2). The possible benefits of using RLOs in the classroom are diverse and could have far-reaching impacts for faculty. Usage can decrease time costs for faculty, as they have the ability to create lessons from units of already-developed material rather than assemble a lesson from scratch (Downes, 2001). Using RLOs, especially within the context of online learning, helps students learn in a "spiraling, progressive manner" (p. 315), which is a mode of learning that comes naturally to the brain and promotes deep learning (Hamid, 2002). Professional development has been named as an "important component" to encourage correct usage of the technology by faculty (Farha, 2009, p. 17).

The incorporation of RLO development in conjunction with an international experience allowed the researchers to investigate faculty perceptions of RLOs and the development process both before and after their engagement in the process. The purpose of this poster is to visually depict faculty perceptions about RLOs and identify best practices for development.

Theoretical framework

The theoretical framework for this study was based upon Kolb's theory of experiential learning (Kolb, 1984) and, as an extension of Kolb's model, the addition of preflection (Jones & Bjelland, 2004). Kolb outlined four stages of learning: abstract conceptualization, active experimentation, concrete experience, and reflective observation. As individuals are guided through each of these stages, an awareness and understanding of the topic at hand is gained. Jones and Bjelland (2004) introduced the idea of preflection. Preflection is a means by which participants are made aware of the expectations of the experience to be had. This activity promotes participants' learning during the first three stages of Kolb's theory of experiential learning model and, in turn, promotes a higher level of information processing during the reflection observation stage.

Methodology

Participants were chosen based on their participation in the [Country] Faculty Abroad Experience. A semi-structured interview model was used to conduct this study (Merriam, 2009). An interview protocol that contained open-ended questions was developed to guide the researchers in the preflection and reflection interview process. Two researchers were present at each interview session and each took field notes. A debriefing session was held after each interview to compare notes and combine them into

one set of working data. To ensure confidentiality, participants were coded as R2- R9. The data was analyzed using the constant comparative method as described by Glaser and Strauss (1967). Emergent themes were categorized and reported.

Findings

Preflection

Faculty participants articulated in the preflection interview that a RLO is a self-contained teaching tool that contains learning objectives, media/photographs, and an assessment tool. This is not surprising given that project planners had informed participants of RLO components prior to their international experience. Participants also indicated that RLOs were easily transferable and usable by interested parties. Although only one of the faculty members had created RLOs in the past, the other seven faculty members indicated that they had created what they felt to be similar learning objects for their classes (e.g., case studies, annotated presentations, etc.). Participants indicated that the RLO creation process would be most challenged by lack of time to work on the materials and the lack of a set template (R2, R3, R4, R5, R7) and also indicated that the work may be made "more efficient" (R9) by collaborating with another faculty member through teamwork (R8). When asked about the potential impact of the RLOs on their curricula, faculty agreed that RLOs would not only extend the students' understanding of the content, but would also provide the students with a broader perspective of the content (R2-R9). Participants reported that RLOs would allow students to see an international setting and possibly correct their misconceptions of different cultures.

Reflection

In analyzing the reflection interview data, the experience affected the faculty's understanding of the RLO creation process. The faculty spoke about the responsibility and challenge to RLO creators to provide ample and vivid context for both the teachers and students that may review the content (R3, R6, R8). In addition to providing acceptable context, challenges also included issues related to time and layout and expanded to include filtering through and gaining access to all of the media that was collected, and writing the script for the narration. Contrary to the faculty's initial preflection to collaborate, not one RLO was created as a team effort. Impact on the faculty's curricula was greatly expanded as a result of the experience. Faculty indicated that the RLOs would be welcomed by the students as a new teaching method and that the RLOs would be much easier to present because they were a genuine experience. Respondent R8 indicated that RLOs are a new teaching method that could be incorporated into a teaching methods curriculum. Respondents also reported hope that the RLOs would increase the students' awareness of opportunities abroad (R2, R4, R6, R7, R9).

Conclusions

Respondents reported positive perceptions of RLOs both prior and after their engagement in the development process. However, it can be concluded that engagement in the RLO development process caused faculty to be more individual in their approach rather than working as teams. Comments related to RLO use and applications during reflection leads one to conclude that engagement in the process increased participants' understanding and desire to use RLOs.

Implications/Recommendations/Impact on Profession

Reusable learning objects offer tremendous potential in regard to extending the reach of faculty to serve students in an efficient manner. However, it is recognized that challenges exist in regard to development and delivery. RLOs must be developed in a way that provides value to both instructors and ultimately to the students. The findings from this study revealed that faculty gained a stronger understanding of RLOs and their value through engagement in the process.

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Evaluation of Climate and Perceived Leadership in a Professional Agriculture Organization

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Evaluation of Climate and Perceived Leadership in a Professional Agriculture Organization

Introduction/Need for Research

Leadership is a highly sought after and highly valued commodity (Northouse, 2010). Northouse (2010) defines leadership as "a process whereby an individual influences a group of individuals to achieve a common goal" (p. 3). Leadership has been conceptualized in a wide variety of ways, including the style approach. This approach emphasizes the behavior of the leader, focusing exclusively on what they do and how they act (Northouse, 2010). Stringer (2002) states that a leader's daily behavior is the most important determinant of climate within an organization, which can be described as the environment perceived by its members.

The *American Association for Agricultural Education's National Research Agenda* (Doerfert, n.d., p. 21) identifies one priority as that of creating and maintaining meaningful, engaged learning in all environments. This research may help to identify what behaviors agricultural leaders can utilize to create the climate necessary for their organization to thrive.

Conceptual Framework

Organizational climate, or perceived environment of an organization by its members, can be described in term of six dimensions (Stringer, 2002). Those dimensions are described as follows:

1. Structure - sense of being well-organized and having clearly defined roles and duties
2. Standards - members' feeling of pressure to improve performance and pride in work
3. Responsibility - feeling of autonomy in work and confidence in individual decisions
4. Recognition - whether or not members feel rewarded for a job well done
5. Support - feeling of trust and mutual support within the group
6. Commitment - members' commitment to and pride in the organization

Leadership behaviors can also be categorized in terms of the six dimensions used to describe climate, indicating that a leader can employ specific behaviors to influence specific dimensions of the organizational climate (Stringer, 2002).

Methodology

The Vocational Agriculture Teachers Association of [*state*] is a professional organization comprised of agriculture educators at the secondary and post-secondary levels and supporters of agriculture education ([*association website*], 2011). Their role is to "inform agriculture teachers about the latest agricultural education practices, encourage higher standards of teaching agriculture and provide agriculture education a unified voice in the state legislature" ([*association website], 2011*). The association provides leadership for agriculture teachers and coordinates continuing education through an annual professional development conference.

A census of the [*association*] Board of Directors present at the meeting conducted during the annual professional development conference was used for data collection (N = 51). The climate questionnaire developed by Stringer (2002) was used. Part I contained 24 questions referring to the perceived organizational climate measured on a 4 point Likert scale. Part II contained 18 questions regarding perceived behavior of the leader, or Executive Director, and were measured using a 5 point Likert scale. Post-hoc reliability calculations produced Cronbach alpha scores ranging from .41 to .69 on Part I and .54 to .81 on Part II.

Results/Findings

Means and standard deviations were calculated for the six constructs on Parts I and II of the climate questionnaire. Pearson product moment correlations were then calculated between the six constructs in Parts I and II. Mean scores for the organizational climate ranged from 2.20 to 3.84, with members' perceptions of responsibility being lowest and commitment being highest. Mean scores related to members' perceptions of the executive director's practices were very high, ranging from 4.21 to 4.61, again with responsibility being the lowest and commitment being the highest.

Correlations were identified and described using Davis's conventions (1971). Moderate positive relationships were identified between Parts I and II on the constructs of structure (r = .44), support (r = .44), and recognition (r = .40). A low positive relationship was found on the commitment construct (r = .24). A moderate negative relationship was found on the construct responsibility (r = -.33), while a low negative relationship was found regarding the construct standards (r = -.10).

Conclusions/Implications/Recommendations

This descriptive study investigated the climate of an agriculture organization, as well as the leadership behaviors of the organization's Executive Director, as perceived by its Board of Directors. Regarding the organizational climate, board members perceived commitment and support to be the strongest, indicating they felt there was mutual trust among the members and commitment to the association. The next constructs members most strongly agreed with were structure and standards, revealing feelings of being well-organized and striving to do a good job. Participants slightly agreed that members were rewarded for a job well done, and they disagreed that there was a high level of autonomy among members, indicating that actions were typically double-checked or approved instead of members taking initiative and acting on their own.

Board members perceived the Executive Director to exhibit behaviors in all six climate constructs, with the lowest mean score being 4.21. Correlations revealed differing relationships between the perceived organizational climate and the perceived actions of the Executive Director. Positive correlations identified may indicate an avenue for further research to investigate the relationship of the leader's actions and the perceived organizational climate in those constructs. The negative correlation found regarding responsibility is intriguing and provides additional opportunity for investigation of the relationship between leadership and organizational climate. Replications of this study are recommended across a variety of organizations in order to further explain the relationship between perceived leader behaviors and climate.

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Exploring Demographic Factors of Southern Region FFA Chapters as Compared to the Respective School and Community

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Exploring Demographic Factors of Southern Region FFA Chapters as Compared to the Respective School and Community

Introduction and Conceptual Framework

This study compared demographic factors of FFA chapters in the Southern Region to the schools and communities in which they exist. According to RPA 5 under the Agricultural Education in University and Postsecondary Settings priority area, this study aligns with the National Research Agenda (Doerfert, 2011) as it investigated educational programs that meet the needs of diverse learners in all settings. Igo and White (1999) noted "future generations of FFA members will increasingly be urban, while the minority will be rural. Few will have a farm background, and even less will have family ties to production agriculture" (p.9). Examining the demographics of Southern Region FFA chapters and comparing each chapter to the demographics of the school and community in which each school is present may provide some insight into recruitment for these programs.

The conceptual framework for this study is based on Brown's (2002) findings which state that recruitment of a diverse student population is essential for a student organization to thrive. However, FFA's membership is traditionally much different. While their study was designed to look at states with the lowest FFA membership, Gliem and Gliem (2000) also reported gender and ethnicity of FFA members. Of the 286 FFA members included in their national study, 61.19% (n=175) were male and 86.62% (n=284) were Caucasian. The field of agricultural education must begin to critically assess its recruitment, engagement, and retention of youth of color or face the demise of the field in the future (Bowen, 2002).

Methodology

To determine the demographic factors of FFA chapters, schools and communities in the Southern region, researchers used stratified random sampling to represent both the overall population and key subgroups such as regions and population density areas while simultaneously providing a more representative sample of the entire population of Southern FFA chapters (Ary, Jacobs, & Razavieh, 1996). Using a list of chapters obtained from the National FFA Organization, the chapters were divided into the four recognized regions: Eastern Region, Central Region, Southern Region, and Western Region. Chapters within each region were then categorized according to population density (as defined by the U.S. Census Bureau) as rural (areas of less than 2,500 people), suburban (areas of between 2,500 and 50,000 people), or urban (areas of 50,000 or more people).

The rural, suburban and urban population density categories within each region served as the strata or subgroups. Within each region, eight chapters were selected at random from those who replied to the initial email for inclusion in the study. Thus, eight rural chapters, eight suburban chapters, eight urban chapters, and eight at-large chapters from Southern

region were included in the study yielding a total of 32 chapters with the Southern Region were chosen.

Findings

The average number of students in the agricultural education programs in these 32 chapters was 140.84 and the average number of students enrolled in the FFA Chapter was 77.28. Therefore, on average, 54.87% of students enrolled in agricultural education in the 32 chapters in the Southern Region were FFA members. The average number of FFA advisors per chapter was 1.41. Table 1 displays the summary data for gender and ethnicity within the 32 chapters selected in the Southern Region of the National FFA and the respective schools and communities in the Southern Region.

Table 1.
Gender and Ethnicity of FFA Chapters in the Southern Region and the Respective Schools and Communities

	FFA Chapter		School		Community	
Demographic Characteristic	*f*	%	*f*	%	*f*	%
Gender						
Male	1306	52.77	15,069	51.46	478,249	51.40
Female	1169	47.23	14214	48.54	452,141	48.60
Ethnicity						
White	1998	80.73	20,221	68.75	488,025	52.49
American Native	28	1.13	251	0.85	4403	0.47
Hispanic	210	8.48	2302	7.83	177,395	19.08
Black	222	8.97	6023	20.48	234,842	25.26
Asian/Pacific Islander	12	0.48	550	1.87	23271	2.50
Other	5	0.20	66	0.22	1734	0.18

Conclusions, Implications and Recommendations

Results from the FFA chapters in this study indicated that FFA chapters in Southern Region are similar to the respective schools and communities in which they are present in terms of gender. When compared to the results of Gliem and Gliem's (2000) study stating a higher male FFA membership, results of the present study show almost equal percentages of males and females in FFA's Southern Region. However, the increase in diverse student membership has not seen much change in the almost 20 years since Gliem and Gliem (2000) collected data in 1995. When compared to the schools and communities from which the Southern Region FFA chapters belong, the chapters contained far less diverse members. Of the 32 chapters in this study, slightly less than 20% of FFA members are an ethnicity other than white.

The following recommendations may apply to agricultural education teachers, state agricultural education staff, key industry stakeholders and National FFA staff. Agricultural education teachers should make every attempt to recruit and retain more diverse students. In order to attract more diverse audiences, professional development efforts must focus on recruitment and retention of diverse members while still effectively serving traditional/current members. There are many different avenues for future research based on demographic characteristics of youth involved in organizations.

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Exploring the Critical Thinking Skills of Undergraduate Students in Agricultural Leadership Courses

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Exploring the Critical Thinking Skills of Undergraduate Students in Agricultural Leadership Courses

Introduction

The ability to think critically is important for students to be successful in college and in the workforce (National Research Council, 1988). A national group of employers and policy-makers found that the dimensions of critical thinking should be considered a valuable outcome of a college education (Jones et al., 1995). Halpern (1996) defined critical thinking as "thinking that is purposeful, reasoned and goal directed – the kind of thinking involved in solving problems, formulating inferences, calculating likelihood, and making decisions" (p. 5).

The *American Association for Agricultural Education's Research Priority Areas for 2011 – 2015* recognizes the need to understand students' critical thinking skills with the research priority area of "develop and assess various learning interventions… to increase … higher order thinking (Doerfert, 2011, p. 9). For students who aspire to serve in a leadership position upon graduation, it is vital they develop the ability to think critically as they make decisions and solve problems for their organization (Stedman & Andenoro, 2007). The purpose of this study was to explore the critical thinking abilities of students enrolled in agricultural leadership classes. This exploratory research will help instructors plan activities and assignments to help develop the critical thinking skills of their students.

Theoretical Framework

Facione (1990) described individuals who can think critically as inquisitive, fair-minded, flexible, diligent, and focused in inquiry. Irani et al. (2007) drew upon Facione's research and previous critical thinking instruments to develop the EMI Critical Thinking Disposition Assessment. EMI stands for Engagement, Cognitive Maturity, and Innovativeness of an individual. The Engagement disposition addresses an individuals' tendency "to look for opportunities to use their reasoning skill and be confident in their ability to reason, solve problems, and make decisions" (Irani et al., p. 5). The Cognitive Maturity disposition describes individuals' awareness of their "own predispositions and biases in the decision making process" (Irani et al., p. 5). Finally, the Innovativeness disposition measures individuals' desire to seek new information that impacts their lives, professions, and beyond (Irani et al.).

Stedman (2009) used the EMI Critical Thinking Disposition Assessment to evaluate the critical thinking skills of undergraduate students in leadership classes. She found that there was no significant differences amongst the construct scores and the demographic groups (gender, age, GPA, major college classification, and honors enrollment). However, she determined that an establishment of critical thinking in the classroom was pertinent to the success of the student in the course and in their lives after the course.

Methodology

The population for this study was 39 students in two agricultural leadership courses (Agricultural Leadership Principles and Personal Leadership Development in Agricultural Sciences and Natural Resources). Students were given the option to not

participate in the study if they chose to do so. The students were administered the EMI instrument at the beginning of the semester in order to assess their critical thinking skills. Students also completed a brief demographic instrument. The EMI instrument has established reliability coefficients for the three constructs: Engagement (.91), Maturity (.78), Innovativeness (.80) and total (.94). Based on previous research, the typical ranges of scores seen with this instrument are 28-55 (Engagement), 16-40 (Maturity), 15-35 (Innovativeness), and 59-130 (Total) (Irani et al., 2007).

Results/Findings

Thirty-nine students ($N = 39$) participated with the study, resulting in a 100% response rate. Respondents were almost even in gender with 20 female (51.28%) and 19 male (48.72%). Most students were seniors ($N = 17$), followed by juniors ($N = 11$), sophomores ($N = 20$), and one freshman. Most students were agricultural leadership majors ($N = 13$), followed by agricultural economics/business or similar ($N = 10$), then agricultural communications ($N = 9$), agricultural education ($N = 1$), and all other majors ($N = 6$). Table 1 provides the ranges, means, and standard deviation for the EMI Critical Thinking Disposition Assessment.

Table 1
EMI scores for students in agricultural leadership courses (N = 39)

	Range	Mean	*SD*
Engagement	30 – 54	43.92	5.17
Maturity	16 – 32	26.26	3.30
Innovativeness	20 – 33	27.36	3.23
Total	74 – 115	97.54	9.12

Students reported the highest mean ($M = 4.23$; $SD = .58$) on the engagement construct item: "I look for opportunities to solve problems." The lowest mean score ($M = 3.18$; $SD = .88$) was on the maturity construct item: "I am likely to change my opinion when I am given new information that conflicts with my current opinion." A t-test compared gender and found no significant differences. A one-way ANOVA was conducted to compare classifications and found no significant differences.

Conclusions/Discussions

Students in the class met or scored higher than the typical minimum values for all the constructs of the instrument, but did not meet the maximum values. It was also observed that the students were very eager to "look for opportunities to solve problems," but were not as interested "to change their opinion when given new information that conflicts with their current opinion." This finding is interesting and provides an area for improvement.

Recommendations

Based on the results of this study, it would be beneficial for the instructor of the agricultural leadership courses to spend additional time teaching the students to be more willing to seek and evaluate information that conflicts with their own opinions. Because the instrument was administered at the beginning of the semester the results may be different after the students have experienced a semester of instruction, in relation to

agricultural leadership. It would be beneficial to implement exercises to encourage critical thinking then have a post-test to evaluate the students' critical thinking scores. This study should also be replicated in agricultural leadership courses at other universities to improve the generalizability of the findings.

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Research Poster Paper

International acculturation: The good, the bad, and the ugly

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International acculturation: The good, the bad, and the ugly

Introduction/Need for Research

Universities across the country are stressing the importance of international education (MacDonald, 2009; Connell, 2003; Jenkins & Skelly, 2004; Larsen, 2004). Cultural understanding and skills attained through international experiences are critical as graduates compete within a global society (Association of American Colleges and Universities, 2008; Samaan, 2005). Post-secondary institutions have implemented international experiences which have shown to enhance students' cross-cultural skills and global understanding; addressing contemporary demands (Kitsantas, 2004). Furthermore, results indicate that international immersion is an effective way for students to acquire cultural understanding (Brooks, Frick, & Bruening, 2006; Jenkins, 2002; Wilson, 1993). However, while international immersion seems to benefit most, student responses to foreign environments can vary. In fact, students who are exposed to new cultures often have visceral reactions (King & Young, 1994). Reactions can range from negative to positive with extreme variance from case to case (Van Der Meid, 2003).

Theoretical Framework

Appraisal theory was used to evaluate student responses toward international immersion. According to Scherer, Schorr, and Johnstone (2001) appraisal theory entails students being exposed to novel stimuli. Individuals appraise stimuli based on their internal beliefs and cultural norms. If stimuli are perceived as aligning with their beliefs, neutral or positive emotions are evoked, however, if stimuli challenge their beliefs, negative emotions can be evoked. Individuals often react differently to the same stimulus, accessing a continuum of emotions. Following initial appraisal, individuals identify coping mechanisms for each situation (Scherer, Schorr, & Johnstone, 2001). This theory was deemed most appropriate as participating students were immersed in an international experience for an extended amount of time. Students revealed thoughts as well as reactions to different situations (stimuli) through journal reflection.

Research Context

Participants in this study consisted of two professors, one graduate student and three undergraduate students majoring in Agricultural Education at a Southern Land Grant University. Three of the four students had prior international exposure. As part of their study abroad course, students worked with two Scottish agricultural island communities, evaluating the influence of agricultural groups within the rural communities. Students were divided into two groups and immersed in their community for 22 days.

Research Questions:

- What objects/events do participating students view as novel stimuli when immersed in an international setting?
- How do students appraise/react toward identified stimuli within an international setting?

Methodology

Students maintained personal journals throughout their international experience. Journals, collected after completion of the course, became a rich data source for identifying student stimulus appraisal and correlating reactions. Journals were collected then holistically and axial coded (Saldańa, 2009) using the primary tenets of Scherer, Schorr, and Johnstone (2001) appraisal theory. Data were substantiated through inter-rater reliability and by confirming qualitative themes with each participant.

Results/Findings

Results from this study were categorized into two categories, students with prior international exposure and students without prior international exposure. Due to page requirements student quotes were not included. However, the following results/findings have been summarized into thematic stimuli and thematic appraisal/reaction as experienced by students

Prior International Exposure (3 students):

Thematic stimuli	Appraisal/Reaction
▪ International travel	▪ Frustration, agitation, anxiety, excitement**,** elation
▪ Culinary differences	▪ Annoyance, disgust**,** enthrallment
▪ Societal norms	▪ Apprehension, contentment
▪ International infrastructure	▪ Aggravation, optimism
▪ Language barriers	▪ Eagerness, optimism

Without Prior International Exposure (1 student):

Thematic stimuli	Appraisal/Reaction
▪ International travel	▪ Fear, isolation**,** panic
▪ Culinary differences	▪ Revulsion, frustration
▪ Social norms	▪ Dismay, homesickness
▪ International infrastructure	▪ Irritation, isolation
▪ Language barriers	▪ Exasperation**,** annoyance

Conclusions/Implications/Recommendations

All students experienced visceral responses toward their experience. However, the stimuli for which they attributed the response differed from individual to individual. Additionally, the intensity and length of emotional response varied. Students who professed prior international experience generally coped with negatively appraised stimuli quicker than the student with no international exposure. Moreover, results indicate group dynamics greatly influenced student appraisal toward international novel stimuli. One group struggled with intrapersonal relationships, heightening the emotional intensity of appraised stimuli. Students were given time for reflection when returning from their experience. Post-reflection analysis indicated students viewed their international experience positively, stating it helped them develop both personally and professionally. However, data analysis revealed that during the experience students generally expressed negative emotions toward self-identified stimuli.

It is critical that teacher educators in agricultural education understand the developmental process of students as they participate in international education programs. If this process is overlooked, students can often perceive their experience as negative, limiting their cultural development (King & Young, 1994). It is recommended that this process be evaluated further in multiple international contexts. It is also recommended that students be educated about their development prior to their international experience. Students may be able to better cope with negatively appraised stimuli better if they are metacognitive about their experience.

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RESEARCH

Lessons Learned from 4-H Rural Youth Concerning Living Healthier Lifestyles

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Lessons Learned from Rural Youth Concerning Healthier Lifestyles

Introduction/Theoretical Framework

Health is a crucial factor that affects national productivity. A healthy and well-nourished population is likely to be more productive and capable of focusing its energies on the provision of goods and services which in turn contributes to the overall growth of an economy. The pursuit of sound nutrition, as an economic objective, alleviates a nation and its people to effectively and efficiently attain goals that significantly improve the human condition (Economic Research Service, 2009). According to Becker (2008), education, training and health are the most important investments in human capital. In order for our youth to develop into educated and productive citizens, they need to be healthy. Unfortunately, the issue of the increased number of youth living unhealthy lifestyles poses an issue with being healthy especially due to obesity.

The prevalence of obesity among children is high and it is increasing, and in spite of the recent national attention directed to prevent obesity, obesity rates have continued to rise in North Carolina. This is especially the case among children and more so in North Carolina Individuals between ages 10 to 17 years are overweight (20%) whereas 14 percent are obese (North Carolina Department of Healthy and Human Services, 2009). High obesity rates are attributable to physical inactivity and unhealthy eating habits. To curtail this issue, the delivery of nutrition education is key which can promote lifelong healthy eating and increased exercise behaviors of youth that should start from early stages of life.

Studies conducted to examine the behaviors of rural communities' habits for living healthier lifestyles. As a result, it has often been found that rural communities have disproportionately higher rates of obesity as well as the related comorbitites of cardiovascular disease and type 2 diabetes because of their lack of knowledge and limited resources.

Methodology

The purpose of this study was to assess the attitudes, behaviors, and knowledge of 4-H rural youth and determine the most appropriate educational approaches for this population. To guide the study, the following research question was developed:

1. What are the attitudes, behavior and knowledge of 4-H rural youth concerning living eating healthy?
2. What are the attitudes, behavior and knowledge of 4-H rural youth concerning exercise behaviors?

The population for this study consisted of rural 4-H youth (*N*=53) grades 6-8. Focus group sessions were held between 2010-2011 at 4-H afterschool sites (*N*=4) to pose questions to youth about their eating choices and exercise habits. Questions were related

to nutrition knowledge, attitude, and skills required to make healthy eating choices. Each participant was given an equal opportunity to communicate their individual viewpoints to the questions posed.

Results/Findings

Fifty-three youth participated in the focus group sessions, who were Native American (N=20), Hispanic/Latinos (N=2), African American (N=31). There were twenty-seven (51%) females and twenty-six (49%) male participants.

Focus group questions posed:

Question 1. What can you do or feel others can do to promote being healthy?
Youth participants stated the following: eating more fruits and vegetables, exercising more, eating less meat, dink more water, reduce sodium and sugar intake, eat fast food less often, and prepare foods at home in healthy ways.
Question 2. What are small changes you can make to be healthy?
Change from eating white bread to wheat, fried to baked foods, using fresh fruits and vegetables versus canned foods for cooking, watching less television and going outside more, drinking less juice and more water, stop eating late at night and become more active.
Question 3. Do you eat three meals a day?
Many youth admitted to not eating breakfast or lunch because they do not like what is served in the school cafeteria.
Question 4. **What foods do you eat at school?**
Overall, the participants said they eat vegetables and fruit, chicken noodle soup, salads, ham and cheese sandwiches, corn, steak and cheese, cheeseburgers, ribs, macaroni and cheese, pizza, French fries, fried chicken, BBQ chicken, and chips. None of the youth reported bringing their lunch to school.

Conclusions and Recommendations

Overall, the findings show that there are many areas youth need to be educating in to live healthier lifestyles. This is especially important during today's increased focus on youth living healthy. Youth are in need of parks and exercise facilities and access to healthy foods. Youth may need more nutrition information to make better choices to become healthier. Parents should be more involved in nutrition education to help them help their children and themselves practice healthy lifestyles. In addition to the focus group session providing information that will assist in guiding future projects toward evaluating the food and nutrition knowledge and attitudes of youth, the focus group created a dialogue that encouraged participants to think about the impact of healthy and unhealthy eating choices on health and disease. The focus group session also encouraged participants to improve their knowledge about nutrition, health and physical activity.

Recommendations/impact on profession

Finally, further research should involve youth expressing their concerns about various nutrition topics such as reading food labels, body image and eating on the fun (fast food).

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Research Poster

2012 Southern Region AAAE Conference

Mathematics Efficacy: An Investigation of Cooperating Teachers and Their Student Teaching Interns

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Mathematics Efficacy: An Investigation of Cooperating Teachers and Their Student Teaching Interns

Introduction/Need for Research

Numerous calls have been made for agricultural education to support core academic subject matter, including mathematics. To do so, agricultural education teachers must be prepared for this task. This implies that preservice teacher education will play an important role in answering the aforementioned calls. According to Cruickshank (1984), there are five explanatory variables in preservice teacher education: (a) teacher educators (education professors and cooperating teachers), (b) teacher education students, (c) context of teacher education, (d) content or curriculum of teacher education, and (e) instruction and organization in teacher education. This study will focus on two of Cruickshank's explanatory variables: (a) cooperating teachers and (b) student teaching interns (teacher education students).

Roberts (2006) stated that cooperating teachers have tremendous influence on the learning experiences of their student teaching interns. Thus to answer the above-mentioned calls, cooperating teachers should be proficient in incorporating core academic subjects into the agricultural education curricula. Correspondingly, Roberts and Dyer (2004) reported that effective agriculture teachers incorporated core subjects into the agriculture program. Furthermore, Tschannen-Moran and Woolfolk Hoy (2001) stated teaching effectiveness could be indicated by a teacher's efficacy beliefs. Therefore, this study will seek to examine potential for effectiveness by describing the personal mathematics efficacy, mathematics teaching efficacy, and personal teaching efficacy of the [University]'s agricultural education cooperating teachers. In addition, this study will compare the mathematics efficacy of the cooperating teachers and their student teaching interns.

Theoretical Framework

Bandura's (1986) social cognitive theory was used to frame this study. According to social cognitive theory, behavior is influenced bidirectionally by environmental and personal factors. In the context of this investigation, behavior is the teaching of contextualized mathematics, the environment is the [University]'s agricultural teacher education program, and the personal factors of interest are personal mathematics efficacy, mathematics teaching efficacy, and personal teaching efficacy of cooperating teachers and their student teaching interns.

Methodology

This exploratory study utilized a one shot case study (Campbell & Stanley, 1963) to describe the personal mathematics efficacy, mathematics teaching efficacy, and personal teaching efficacy of [University]'s agricultural education cooperating teachers and their student teaching interns. The sample consisted of 12 cooperating teachers, 4 males and 8 females, and 12 student teaching interns, 2 males and 10 females. Data were

collected using Jansen's (2007) *Mathematics Enhancement Teaching Efficacy Instrument* at the beginning of the student teaching experience in the Spring of 2011. The aforementioned instrument measures three constructs: (a) personal mathematics efficacy (r = .84; 1 = Not at all confident to 4 = Very confident), (b) mathematics teaching efficacy (r = .88; 1 = Strongly disagree to 5 = Strongly agree), and (c) personal teaching efficacy (r = .91; 1 = Nothing to 9 = A Great Deal).

Results

The data indicated that the cooperating teachers in this study were confident in their personal mathematics efficacy (M = 3.72, SD = .50), and they perceived themselves as having "Quite a Bit" of influence in affecting student learning (personal teaching efficacy, M = 7.47, SD = .93). In addition, the cooperating teachers were moderately efficacious in their mathematics teaching efficacy (M = 3.69, SD = .33). Similarly, the student teaching interns were confident in their personal mathematics efficacy (M = 3.31, SD = .72) and perceived themselves as having "Quite a Bit" of influence in affecting student learning (personal teaching efficacy, M = 7.31, SD = .78). However, the student teaching interns were uncertain of their ability to teach mathematics (mathematics teaching efficacy, M = 3.15, SD = .76). Additionally, an analysis of the cooperating teacher/student teaching intern pairs revealed that 83.3% of the cooperating teachers scored higher than their student teaching intern on personal mathematics efficacy and only 66.7% of the cooperating teachers scored higher than their student teaching intern on mathematics teaching efficacy and personal teaching efficacy.

Conclusions

The overall mean scores of the cooperating teachers were slightly higher than the student teaching interns for all three constructs: (a) personal mathematics efficacy, (b) mathematics teaching efficacy, and (c) personal teaching efficacy. However, the cooperating teacher/student teaching intern pairs revealed that not all of the cooperating teachers scored higher than their student teaching intern on all of the above mention constructs.

Implications/Recommendations

[University] teacher educators should be encouraged that the cooperating teachers and the student teaching interns in this study were efficacious in their mathematics ability and personal teaching efficacy. According to Bandura (1986), personal factors influence behavior and the environment. Therefore, theoretically, being efficacious in personal mathematics efficacy and personal teaching efficacy should positively impact the teaching of contextualized mathematics in the agricultural education curricula and the environment of the agricultural teacher education program. On the other hand, the mathematics teaching efficacy of the cooperating teachers and their interns may be of concern, since the data indicated that the cooperating teachers were moderately efficacious and the teaching interns were uncertain of their mathematics ability. Theoretically, this should negatively impact the teaching of contextualized mathematics

and the agricultural teacher education program. More precisely, cooperating teachers that are only moderately efficacious and/or scored lower than their student teaching intern may negatively influence their teaching intern's attitudes and competence in teaching contextualized mathematics. Thus, future research should seek to improve the mathematics teaching efficacy of [University]'s cooperating teachers and their student teaching interns and seek to quantify the impact of cooperating teachers' mathematics efficacy and mathematics teaching efficacy on student teaching interns' mathematics efficacy and mathematics teaching efficacy.

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North Carolina Agriculture Teachers' Perceptions about In-service Training Needs for the 21st Century

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[State] Agriculture Teachers' Perceptions about In-service Training Needs for the 21st Century

Introduction and Theoretical Framework

In the contemporary world, teachers are faced with greater expectations due to changes in society and technology (Moeini, 2008). Due to the nature of their subject matter, agricultural teachers have historically had a need for in-service education to ensure that the skills that they have are current and up-to-date (Barrick, Ladewig, & Hedges, 1983). Departments of agricultural education have historically functioned to identify and deliver the most relevant in-service workshops to teachers (Barrick, et al., 1983). It is a challenging task for teacher educators to determine the appropriate content of educational workshops to meet the ever changing learning needs of agricultural teachers. We all are affected by the current trend in globalization (Smith, Jayaratne, Moore, Kistler, & Smith, 2010). Globalization is a changing force that shapes governments, businesses, organizations, and individuals (Lundy, Place, Irani & Telg, 2005). A report by the National Association of State Universities and Land Grant Colleges (NASULGC) says that "globalization of the financial services, manufacturing and agricultural sector is having a profound influence on all facets of American society" (2002, p. 3). This tells us that we need to prepare American students to meet the needs of a globalizing economy. The first step in preparing agricultural students to meet the global challenges is educating agricultural teachers for this task. Joerger (2002) emphasized the significance of timely, relevant in-service educational programs for preparing agricultural teachers to meet the changing needs. As teachers' in-service educational needs change with time, it is necessary to assess their learning needs regularly with the input from teachers for planning timely relevance in-service programs for them (Ewing, Gill, Radhakrishna, & Clark, 2009; Garton & Chung, 1997; Layfield & Dobbins, 2002; Roberts & Dyer, 2004). The review of this literature highlights the significance of assessing agricultural teachers' perceptions about the skills important for them to teach and training needs for acquiring those skills in preparation for the 21st century teaching.

Purpose

The purpose of this study was to determine [State] agricultural teachers' perceptions about the skills needed for them to prepare students in the 21st century. It also, determines the in-service needs for preparing agricultural teachers to meet the challenges in the 21st century. This poster will display the results of this study.

Methodology

This was a descriptive online survey research study conducted with the entire population of agricultural teachers in [State]. A survey instrument was designed with two scales - one for recording perceptions about the 21st century skills and the other for recording in-service training needs. The perception scale consisted of 25 items on a 5-point Likert scale ranging from 1 being 'Strongly Disagree' to 5 being 'Strongly Agree.' The training needs identification scale consisted of 20 items on a four-point Likert scale ranging from 1 being 'Not Important' to 4 being 'Extremely Important.' A panel of experts reviewed the instrument and established the validity. It was pilot tested with a

group of agricultural teachers in another state to establish the reliability. The pilot test revealed the Cronbach alpha of the perception and training needs scales were .97 and .95 respectively. The survey received 215 usable responses comprising a 59% response rate. Early and late respondents were compared to address non-response error and found that there was no significant difference between the early and late respondents (Lindner, Murphy, & Briers, 2001). Descriptive statistics, factor analysis, regression analysis, and t-test were used to summarize results.

Results and Conclusions

Of the respondents, 64% were male. Ninety one percent of the respondents were White. Ninety four percent of the respondents were high school agriculture teachers. Of the respondents, 70%, 21%, and 9% were in rural, suburban, and urban schools, respectively. Nearly 21% of the respondents were lateral entry teachers. Sixty five percent of the respondents had a graduate degree. Respondents' teaching experience ranged from one to 38 years with the mean of 14 years.

Factor analysis was used to categorize 25 teaching skills into four identifiable factors. These four factors were identified as *skills for globalization in new millennium*, *skills for instructional strategy and creativity, skills for curriculum development with contemporary socio-economic issues,* and *skills for preparation of careers in agricultural education*. The factor analysis led to grouping 20 training needs into four groups. The four groups were *curriculum development training needs, instructional strategy training needs for globalization and working with millennial students, emotional intelligence training needs,* and *leadership and college preparation training needs*.

The overall training needs of respondents did not vary with their experience, ethnicity, urban, suburban, or rural schools, direct or lateral entry, and their level of education. Training needs varied only with the gender difference of teachers. Female teachers' overall training needs were greater than those of male teachers.

Recommendations

When in-service educational programs are developed for preparing agricultural teachers for the 21st century, it is important to integrate their educational needs such as *curriculum development, instructional strategy for globalization and working with millennial students, emotional intelligence,* and *college preparation and leadership development.* More attention should be paid to meeting the in-service training needs of female teachers.

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Perceptions of Inquiry-based Instruction: An Investigation of Agriscience Classrooms

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Perceptions of Inquiry-based Instruction: An Investigation of Agriscience Classrooms

Introduction/Need for Research

Science education has conducted many studies in the past decade to determine student perceptions of science. Teachers are able to meet the pedagogical needs of learners through an increased understanding of their learners' perceptions about science (Beghetto, 2007). Thoron and Myers (2010) indicated that agriculture teachers identify a connection between agricultural education and science education. Examination of agriscience student perceptions about science while in an agricultural education program can help determine pedagogical needs of agriscience learners. Waight and Abd-De-Khalick (2006) found that when a teacher used inquiry-based instruction (IBI) student group discourse increased. Therefore, increased student discourse allows for knowledge gain based on the zone of proximal development (Vygotsky, 1978).

Thoron (2010) found that there was a negligible relationship between student demographics and overall content knowledge scores on achievement instruments. Thoron concluded that teaching methodology affected content knowledge scores and further reported students taught through IBI scored higher on content knowledge exams, scientific reasoning, and developed higher argumentation skills. Further knowledge is warranted to find if teaching methods affect student perceptions of science in the agriscience classroom. The purpose of this study was to determine if instructional methodology alters agriscience students' perceptions about science.

Methodology

This research was part of a larger 12-week study examining the effects of the subject-matter approach and IBI. The population of the study was students of ten National Agriscience Teacher Ambassador Academy participants (N=305). Intact groups were randomly selected to receive either IBI (treatment) or the subject matter approach to learning (control). At the end of the instructional period, the Science Attitude Inventory was administered to both the treatment (n=170) and control (n=135) groups. The Science Attitude Inventory is a researcher-developed instrument adapted from the Mathematics Attitude Inventory created by the Minnesota Research and Evaluation Project Team (1972). The adapted instrument reported a Cronbach's alpha of .89 deeming the instrument reliable. The instrument consisted of 48 scale questions examining the students' perceptions of science. The data was entered and ran through SPSS version 19.0.

Results/Findings

The objective of the study was to determine if significant differences existed between treatment groups based on the type of instruction participants received. There was a significant difference (p<.05) reported between the treatment and control groups in 15 of the 48 statements (Table 1). In order to conserve space, only statements that were found to have significant differences were reported in the abstract.

Conclusions

The type of instruction plays a role in determining the student's perception of science. Students reported having a positive perception of science content when enrolled in a course that incorporated IBI. In addition, IBI students reported an importance for incorporating science concepts throughout their daily lives. Students in subject matter

classes feel disconnected from science content and have a less positive perception of science content. Therefore, subject matter students perceived that science did not play as important role in their understanding the world nor is science as useful for their needs. Differences were also found between the two groups regarding the level of assistance needed in completing science coursework. IBI students indicated less of a need for support from instructors when completing science work. IBI students also indicated a better perception of science. Moreover, science concepts incorporated into the agriculture curriculum were found to be more interesting to students that were taught through IBI. Conversely, students enrolled in courses using a subject matter approach felt a higher level of disinterest and frustration with science curriculum and indicated they received more individualized instruction.

Implications/Recommendations/Impact on Profession

Students taught through IBI had better perceptions and believed science played a more integral role in their lives when compared to students taught through the subject-matter approach. It is recommended that IBI be utilized in the agriscience classroom to aid in building student perceptions about science. Students taught through IBI believed the instructor provided less overall individualized instruction. The implication of this finding hints that a shift in the role of the teacher during IBI instruction (facilitation role) vs. a more traditional approach to teaching (holder of knowledge) was noticed by students and was more difficult for the students to adapt. The profession should continue to study the effects of IBI on student perceptions and achievement. Thoron (2010) reported students achieved at higher levels on assessments and this study indicated students have better perceptions about science as a result of IBI. The profession should strongly consider incorporating more IBI into the curricula through preservice and professional development.

Table 1

One-way Anova for Science Attitude (N = 305)

	Treatment (n = 170)		Control (n = 135)			
Statement	*M*	*SD*	*M*	*SD*	*F*	*p*
Science is helpful in understanding today's world	3.40	.84	2.72	.84	12.14	.00
I enjoy talking to other people about science	3.13	.83	1.96	.84	17.72	.00
I am good at working science problems	3.58	.69	2.48	.92	14.32	.00
Working with formulas upsets me	1.88	.64	2.50	.65	12.82	.00
Most of the ideas in science aren't very useful	1.98	.82	2.64	1.04	18.70	.00
If I don't see how to work a science problem right away, I never get it	1.29	.78	2.49	.95	12.36	.00
No matter how hard I try, I cannot understand science	1.70	.58	2.12	.83	16.80	.01
I would rather be given the right answer to a science problem then to work it out myself	2.07	.90	2.72	.89	12.68	.01
My agriscience teacher is willing to give us individual help	3.37	.64	3.64	.64	8.40	.01
I have a good feeling toward science	2.80	.80	2.44	.87	13.40	.01
My agriscience teacher makes science interesting	3.49	.77	3.00	.87	9.24	.02
Science is of great importance to a country's development	3.29	.74	2.80	.87	12.23	.02
Science is useful for the problems of everyday life	3.17	.73	2.76	.78	12.16	.03

Working science problems is fun	3.38	.81	2.08	.91	10.10	.03
You can get along perfectly well in everyday life without science	2.02	.80	2.52	.97	10.92	.03

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Safety Analysis of Post-Secondary Students Enrolled in Welding Courses: Does Past Experience Affect Safety Attitudes and Behaviors?

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Safety Analysis of Post-Secondary Students Enrolled in Welding Courses: Does Past Experience Affect Safety Attitudes and Behaviors?

Introduction / Theoretical Framework

Agricultural Mechanization Courses have been a popular choice among students in both secondary and post-secondary education. The students and instructors in those classes are exposed to many machines and human factors that could lead to fatal and non-fatal injury incidents. An overwhelming number (86%) of secondary agricultural education teachers have reported that they are actively sharing agricultural safety and health hazard information (Pierson & Murphy, 1996).

Hubert, Ullrich, Linder, and Murphy (2003) suggested that positive safety attitudes and practices among agricultural educators were essential to ensuring students' educational opportunities are not hampered. Not only is safety essential for learning, but a legal obligation as well (Daniels, 1980; Gliem & Hard, 1988). Secondary agricultural teachers who do not reinforce proper safety procedures have set a dangerous precedent for their students to replicate. Do students who have participated in secondary agricultural mechanization courses develop dangerous habits prior to enrolling in collegiate level courses?

Woodworking is typically one component of an agricultural mechanization curriculum at both secondary and post-secondary institutions. A survey conducted by Becker, Trinkaus, and Buckley (1996) found that 65% of 283 amateur and professional woodworkers in New Mexico had reported tool-related injuries. Of those 184 woodworkers, 33% had reported sustaining injuries of enough severity to require medical attention. Half of those participants reported having completed at least one course in safety. It should be noted that there was no significant difference between levels of experience and the amount or severity of injuries sustained. Do these injuries occur in the welding laboratory as well? If there was no significant difference between the injuries sustained and level of experience, then what factors are responsible? If injured participants reported taking safety classes prior to sustaining the injury, was the injury a result of neglect? Does attitude play a role in these accidents?

Purpose / Objectives

As colleges of agriculture seek to instruct pre-service teachers the safe practices and proper uses of mechanics equipment, it becomes important to examine the safety habits of teacher candidates. If instructors can identify the sources of unsafe habits, they will be better equipped to address the issues. In an effort to identify one possible source, the objective of this study was to examine the difference in safety behaviors between students with prior coursework and students with no prior agricultural mechanization courses.

Methodology

The target population for this study consisted of students enrolled in welding-related courses at three universities. The courses enrolled students from a wide variety of majors both internal and external to the [colleges] and focused primarily on metals and welding. The purposive sample was selected and assessed from the Spring 2010 and Fall 2010 courses. At the conclusion of the courses, students were asked to identify their perceptions of welding safety and their self-efficacy for both learning and safety. The Spring 2010 courses consisted of 89 students with 74 returning completed instruments.

The Fall 2010 course consisted of 19 students with 19 returning completed instruments. The total combined returns yielded 93 usable responses.

The research instrument utilized in this study was adapted from the attitudes of agricultural employers and employees toward farm safety instrument (Reinhart, D.D., Bean, T. L., & McCaslin, N. L., 1996). The adapted instrument was examined for face and content validity by a panel of 7 agricultural mechanization instructors from three different universities. Because the metals and welding courses were only offered once per year, and the representative makeup of the class was impossible to duplicate due to the wide diversity of majors enrolled, the researchers chose to utilize the adapted instrument and report both original and post hoc reliabilities.

Results

The objective of this study was to examine the difference in safety behaviors between students with prior coursework and students with no prior agricultural mechanization courses. The results indicated that 42% (N=39) of the population had prior coursework in mechanics, whereas 58% (N=54) lacked prior experience. In order to address the objective, the mean scores were compared and effect sizes were generated between the two groups. Table 1 contains the mean values and effect sizes for both groups for the top three effect size scores. Effect size descriptors were reported according to Cohen's effect size descriptors (Cohen, 1988). With the exception of the response to the reading of owner's manuals, students with prior experience had lower mean scores on almost all statements of safe behavior and higher mean scores on statements of unsafe behavior.

Table 1

Difference in students' perceived welding safety behaviors

Survey Item	Group	M*	SD	Effect Size
It is OK to remove ground plugs on tools	No Experience	4.89	1.53	
	Prior Coursework	5.49	0.89	0.48
Studying the manufacturer's equipment manuals increases safety in the workplace.	No Experience	5.39	0.74	
	Prior Coursework	5.64	0.54	0.41
Torn/baggy clothes should be worn when operating machinery	No Experience	1.87	0.34	
	Prior Coursework	1.51	1.28	0.39

*Six-point, likert-type scale, 6 strongly agree, 1 strongly disagree

Conclusions / Implications

From the results of this study, it appears that students with prior mechanization courses have less favorable perceptions of welding safety behaviors. Alternatively stated, it appears that these students are more careless when it comes to safety. Students with prior experience are willing to take more shortcuts. For example, students with prior experience felt it was ok to not wear shaded lenses while oxy-fuel welding as long as it was not a precision weld. Small shortcuts can and will lead to accidents in the laboratory.

Research from this study leads to further questions. Where are these students learning these shortcuts and becoming comfortable with them? Is safety being stressed in the secondary school laboratory?

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Student Competency Levels Entering Post-Secondary Introductory Agricultural Mechanics Courses

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Student Competency Levels Entering Post-Secondary Introductory Agricultural Mechanics Courses

Introduction

In post-secondary agricultural programs across the nation, classes are not solely comprised of lectures and notes, but also the incorporation of hands-on, real world student experience (Rivera, 2005). Agricultural programs teach not only the skills needed for the student's degree area, but also work ethic and critical thinking skills as well. Each class in the agricultural mechanics curriculum is reevaluated to determine if there is proper coverage of competencies and skills. Once the competencies and skills are determined for each individual class, the faculty designates key assignments in each class in which students can demonstrate the competencies learned (Brumm, Mickelson, Steward, Kaletia-Forbes, 2001). The purpose of this study was to determine the skills of students entering the basic agricultural mechanics course. The objective of the study was: Determine the initial skills of students in the areas of: electricity, small engines, surveying/precision agriculture, and metal work.

Conceptual Framework

Competency-based learning involves redefining program, classroom, and experimental education objectives as competencies or skills, and focusing coursework on competency development (Brumm, et al. 2006). By definition, a competency is a combination of skills, abilities, and knowledge needed to perform a specific task (U.S. Department of Education, 2001). A pyramid-type structure can depict the interrelationships within competencies. Each rung of the ladder is thought to influence those rungs that appear above and below. The first rung of the pyramid consists of traits and characteristics that constitute the foundation for learning. The second rung consists of skills, abilities, and knowledge. The third rung consists of competencies. The top rung consists of demonstrations which are results of applying competencies (Voorhess, 2001). Specifically referring to agricultural mechanics programs, the bottom rung is comprised of the traits and characteristics of the incoming students. The second rung consists of the skills, abilities, and knowledge that will be developed by the students throughout the introductory agricultural mechanics courses. The third rung consists of competencies resulting from integrative learning experiences. The top rung consists of demonstrations which are results of applying competencies of agricultural mechanics learned in the graduate level classes.

Methodology

The population consisted of select agricultural mechanical courses at two universities from nine classes from fall 2008 to fall 2011 (N = 230). The instrument was developed by faculty in Agricultural Systems Technology. Survey questions were based on the basic skills that students should possess in the following four sections: electricity, small engines, surveying/precision farming, and metal work. The questionnaire was presented to a panel of experts consisting of agriculture education and agriculture system technology faculty members to establish face and content validity. The reliability coefficient (Cronbach's Alpha) for the questionnaire was 0.868. The competency levels were based on a 5 point Likert scale: 0 = no experience, 1= have observed, 2= done with assistance, 3= can perform without supervision, and 4= perform(ed) routinely. Surveys

were administered on the first day of each course to measure the skills of the incoming students.

Findings

The results from the survey indicated that 41.3% of all students enrolled had taken at least one agricultural mechanics course at the high school level. The results showed that 71.7% had grown up on a farm. There was slightly more females (56.5%) taking the course than males (43.5%).

The results from the survey also indicated that for the five skills required in the section of metal work, 66% of students had only seen or never done the skills. The results also showed that 13.5% of students that had done the skills with assistance and 19.9% students that could perform the skills without supervision or routinely The results from the survey suggest that of the five required metal work skills, operating a propane and/or oxy-acetylene torch for cutting had the highest familiarity (25.7%) on how to perform this skill.

For the eleven skills in electricity, 66.8% of students that had only seen or never done the skills, 15.3% done the skills with assistance, and 17.7% could perform the skills without supervision or routinely. The results from the survey suggest that of the eleven required electric skills students should know, use of wire strippers (52.6%) and Install a light (28.7%) had the highest familiarity on how to perform these skills.

Students indicated that they had the least exposure to surveying/precision agriculture with 71.4% had never seen or ever performed these skills. 13.5% could perform the skills without supervision or routinely. Results from the survey suggest that of the nine required surveying/precision agriculture skills students should know, use of handheld GPS had the highest familiarity (28.7%) on how to perform this skill.

For the eight skills in small engines, 54.5% of students had only seen or never done the skills, 15.9% done the skills with assistance and 29.5% could perform the skills without supervision or routinely. The results from the survey suggest that of the eight required small engines skills students should know, changing oil had the highest familiarity (45.6%) on how to perform this skill.

Conclusion/Recommendation

Through the analysis of the data for this study majority of students have either observed or had no exposure to the skills, let alone attempted them, which are required for the post-secondary entry level agricultural mechanics class. Students entering these courses are at the first rung of the pyramid, coming in with the foundation for learning based on their traits and characteristics. The skills and knowledge to be taught in the course are to move the students to the second rung and give them the basic skills in agricultural mechanics. If students retention of the skills learned in these courses are low than a reevaluation of the curriculum should be done to see what gaps can be filled or if a new class should be open to focus on a specific area. A reevaluation of high school agricultural mechanics curriculum should take place and see if the skills students should be leaving with can be taught more effectively. If the curriculum is missing any sections of the core areas, than it should be looked at how to incorporate the skills or if another designed agricultural mechanics class should be added to the high school curriculum. If an agricultural mechanics shop does not have the proper tools, equipment, or facilities to teach certain

skills than other learning methods or outside sources should be looked into so all core sections can be shown effectively.

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Student Perceptions of Agricultural Advocacy – A Mixed Methods Study

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Student Perceptions of Agricultural Advocacy – A Mixed Methods Study

Introduction/Need for research

Production agriculture is a controversial subject (Fraser, 2001). Fraser (2001) suggests that disagreements about the ethics involved with production agriculture often manifest in the form of emotionally charged claims that neither fully nor accurately represent the agriculture industry. Agriculturists must learn to recognize and use advocacy and persuasive techniques in response to inaccurate statements. Advocacy involves "pleading a cause, or encouraging someone to support, speak, or write in favor of a particular behavior or action" (Johnson & Mappin, 2005, p. 2). As new social networking and technology intensive media emerge, opportunities to increase the possible audience for agricultural advocacy are expanded (Hon, 2006). While activists increase efforts to displace modern production agriculture, a sense of urgency is created for the future workforce of the agricultural industry to develop the skills needed for effective advocacy. However, opportunities to engage undergraduate students in learning advocacy skills are both limited and underdeveloped. The need for research concerning advocacy is broad. First, the 2011-2015 National Research Agenda identifies public and policy maker understanding of agriculture and natural resources as the top priority research area for those employed in food and agricultural systems (Doerfert, 2011). Second, as the industry and skills needed to work in the industry evolve, the agricultural workforce must develop advocacy skills to remain globally competitive (Department of Agriculture, Fisheries, and Forestry [DAFF], 2009). Third, agricultural educators should be familiar with student perceptions of advocacy in order to develop advocacy based curriculum. Finally, though the need for research is evident, a search for articles with advocacy as the primary subject in the Journal of Agricultural Education and other agricultural discipline journals yielded zero results. The purpose of this study was to explore student perceptions of agricultural advocacy. The researchers aimed to determine whether or not students pursuing a degree in agriculture held the same attitudes toward animal agriculture, and assess student definitions of advocacy, student perceptions of effective advocacy skills, and student opinions of the importance of advocacy in agricultural careers.

Theoretical Framework

This study was grounded in Festinger's (1957) cognitive dissonance theory. According to Festinger (1957), people desire consistency among individual concepts including attitudes, behaviors, beliefs, values, and opinions. Cognitive dissonance theory suggests that dissonance occurs when information is presented that contradicts with one's held concepts, thus motivating an individual to action. Action can take the form of additional inquiry, or can cause individuals to formulate an appropriate response to justify their existing worldview. Thus, bias, opposition, and analyses in cognitive dissonance presents an opportunity for learning (Gorski, 2009). In this study, cognitive dissonance was introduced to provoke student to reflection on advocacy.

Methodology

Participants were undergraduate students (n = 15) enrolled in an oral communications course for agriculture majors. The mixed methods approach was a sequential exploratory

study with a quantitative → qualitative two-strand design of inquiry (Teddlie & Tashakkori, 2009). First, the Animal Attitudes Scale (AAS) (Herzog, Betchart, & Pittman, 1991) was administered to determine attitudes toward animal rights and animal welfare. The AAS, assesses individual differences in attitudes toward the treatment of animals through a 20-item Likert-type instrument; Cronbach's alpha = 0.93. Student scores were assessed on the AAS to determine whether they held attitudes consistent with animal rights or animal welfare. Based on the results, students were then assigned to one of two groups - animal rights (n = 8) or animal welfare (n = 7) for the purpose of viewing a short video that advocated for issues opposite the viewpoint of the student. For example, students whose scores on the AAS indicated attitudes in line with animal rights watched a video advocating for animal welfare through persuasive methods. Students in the animal welfare group watched a video advocating for animal rights in the same manner. After watching the video, students provided written responses to 11 open ended questions regarding agricultural advocacy. According to Bogdan and Biklen (2003), participants may express opinions more freely with open-ended questions than interviews, deeming this method of data collection fitting. Qualitative data were analyzed using constant comparative analysis, while inter-rater reliability was established because the researchers coded responses separately, thus increasing confidence in the emergent themes (Bernard & Ryan, 2010).

Results/Findings

Using the results from the AAS, an independent-samples t-test was conducted to compare attitudes toward the treatment of animals in those who support animal rights and those who support animal welfare. There was a significant difference in the scores for the animal rights group (M = 50.38, SD = 8.62) and the animal welfare group (M = 73.43, SD = 8.30); $t(13) = 5.26$, $p = 0.0002$. Based on the qualitative data analysis regarding student perceptions of agricultural advocacy, two primary themes emerged: (1) Awareness of advocacy - (a) definitions of advocacy, (b) limited knowledge/preparation in coursework, (c) need for combining persuasive techniques; and (2) Value of advocacy - (a) strengthened argument, critical thinking and literacy skills and (b) importance of advocacy skills in professional futures.

Conclusions

By introducing cognitive dissonance through advocacy materials from differing viewpoints, students were empowered to experience advocacy in action and reflect on effective advocacy skills. Results indicated differences regarding student attitudes towards animal practices; not all undergraduate agriculture students have similar attitudes about animal agriculture. Variance regarding student definitions of advocacy suggests that instruction of advocacy at the undergraduate level is limited and highlights misunderstandings about proper components, influence, and use of advocacy in agriculture. Participants suggest the need to combine emotion, personal stories, as well as images as effective advocacy techniques for this age group. Finally, students agree that advocacy skills in the agriculture industry will be necessary as a future agricultural professional; however, students do not feel prepared to advocate effectively.

Implications/Recommendations/Impact on Profession

Implications of this study are important to agricultural education. Enhanced curriculum development is necessary to engage students in critical thinking, literacy, and advocacy skill development; emphasis should be placed on both traditional and modern technological models of advocacy. Further investigation with a larger audience is recommended to expand the findings of the current study. As agricultural educators aim to equip students with advocacy skills, care should be taken to not impose certain views, but to enhance individual perspectives. With increased focus on teaching advocacy, agricultural educators must become more engaged in issues and help the public and policy makers understand the full gamut of agriculture.

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Student Recruitment Process for Career and Technical Education

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Research Poster

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Student Recruitment Process for Career and Technical Education

Introduction/Need for Research

Even in the face of the current economic recession, "the share of 18- to 24-year-olds attending college in the United States hit an all-time high in October 2008" (Fry, 2009, p. 1). These increases have occurred steadily over the past ten years despite college tuition increases that averaged 4.9% per year in addition to general inflation (College Board, 2009). As total postsecondary school enrollment increases across the U.S., it stands to assume that increased enrollment should occur within individual majors as well.

Within career and technical education, "The supply of Industrial Technology educators depends upon the number of Industrial Technology teacher preparation programs" (Bell, 2007, p. 4). However, many colleges and universities are cutting Career and Technical teacher preparation programs out of their courses of study (Bell, 2007). This would put Career and Technical Education programs at risk of fading out completely, both at the college and secondary levels (Pucel & Filster, 1997). Family and Consumer Science Education and Agriculture Education enrollment should be on the rise throughout the country as the demand for quality applicants continues to increase (Bell, 2007).

In order to continue to produce qualified new teachers for middle and high school Career and Technical Education programs, universities must recruit new students to be CTE majors. Current research suggests that the most effective recruitment practices for college recruiting are visits to high schools, interaction on the Internet, hosting campus visits, and offering merit-based scholarships (Grandillo, 2011). Hoover and Scanlon (1991) recommended that teacher education programs work closer with secondary teachers, counselors, and administrators in order to promote the profession. This study will examine the recruitment efforts at one College of Agriculture to determine which methods are the most effective within CTE programs.

Conceptual/ Theoretical Framework

Recruitment theory is based off the idea of a recruitment funnel where a high number of inquiries of prospective students from numerous entry points narrows to and moves toward application and ultimately a smaller number of matriculated students (LaBerge, 1962). This process of funneling students into a program is aided by conscious recruitment efforts by the college in order to move the potential student from casual interest in the college to the action of enrolling.

Methodology

To evaluate the effectiveness of the recruitment strategies conducted by a College of Agriculture's Career and Technical Education program, a quantitative case study was implemented. A questionnaire was administered to the freshman enrolled within the teacher education program at the University of [STATE]. Participants (n = 14) anonymously answered a series of questions that inquired the reflection of their recruitment experiences to the teacher education program. A panel of experts (n = 3)

examined the questionnaire for face and content validity. Criterion validity was determined through a literature review of college recruitment strategies. The study was descriptive in nature and therefore results were reported in frequencies and percentages.

Results/Findings

The majority of students reported they discovered the Career and Technical Education program at the University of [STATE] through their secondary classroom teacher (*f* = 8; 73%), followed by a university professor (*f* = 6; 54%). Most of the students (*f* = 8; 72%) reported their recruitment process to the CTE education program consisted of a university tour. When examining experiences during the recruitment process, the majority of current students (*f* = 4; 36%) believed the admissions office provided the most frustrations. When asked if the CTE program is meeting the freshman student's expectations that they held prior to admission, all students (*f* = 14; 100%) answered that the CTE program is meeting their expectations.

The last two questions were in short answer format. The sixth question asked the students what the CTE program could do to attract more students. The general theme was that the CTE programs could do more advertising in high schools and have meetings with/send letter to possible recruits. The last question was asking the students what they feel the CTE could have done to make their recruitment process better and one general theme from this question was that they had a great experience and the CTE couldn't have improved anything to make their recruitment process better. The other general theme was that the students want to know what more to expect and maybe be connected with multiple professors.

Conclusions/Implications/Recommendations

Based on the results of this study, there are several recommendations for future research as well as possible changes to the recruitment process for Career and Technical Education at the University of [STATE]. The first recommendation would be to conduct a larger study at the university in order to verify the results of this case study. This study could be expanded and a study could be completed at other universities that offer Agricultural Education and Family and Consumer Science Education. A more thorough interview could be completed with new students to the Career and Technical Education Program in order to determine the level of effectiveness each recruitment method had on their decision.

The majority of students in University of [STATE] Career and Technical Education program were informed about the program by their secondary Agriculture Education or Family and Consumer Science teachers. Also, many students were given tours of the College of Agriculture and completed campus visits prior to their attendance. Based off these findings, the most effective recruiting techniques were communication with high school CTE teachers, campus tours, and college visits. It is recommended that the College of Agriculture of the selected university continue to work and communicate with secondary Family and Consumer Science and Agriculture Education teachers.

The college website was only used by one new student during their recruitment process to the CTE program. Therefore, it is recommended that more emphasis should be placed on the college website, as the internet becomes a more and more important research tool for potential students. If the website was more user-friendly and information-rich then traffic would most likely increase and more potential students would use it as a tool in their college decision-making process (Dawson, 2009).

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Research poster abstract

Students' Perceptions of Agriscience when Taught Through Inquiry-based Instruction

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Students' Perceptions of Agriscience when Taught Through Inquiry-based Instruction

Introduction/need for research

Students' motivation to achieve in science is directly related to their attitudes toward science (Sandoval & Harven, 2011). Attitudes toward science are developed over time, from an accumulation of science classroom experiences, and can be influenced by actions of the teacher, the instructional approach, and the manner in which activities are conducted (Wee, Fast, Shepardson, Harbor, & Boone, 2004). If students do not have a favorable attitude toward science, they may not be motivated to learn science. Thus, it is important to utilize instructional techniques that will help students learn, and be motivated to learn science.

Inquiry-based instruction (IBI) aids students to gain a deeper conceptual understanding and develop scientific reasoning skills (Sandoval & Harven, 2011). Students' develop these skills by making observations, posing questions, utilizing existing knowledge and analyzing data in order to draw conclusions (NRC, 1996). Past research regarding IBI has shown that IBI improves students' attitudes and perceptions toward science learning experiences (Wee et al., 2004). Studies indicated that students' who have participated in inquiry instruction appreciate the ability to understand data in order to draw conclusions and support their ideas (Sandoval & Harven, 2011). Although there is sufficient research concerning students' perceptions of inquiry in the science classroom, there is little research concerning students' perceptions of IBI in agriculture.

Theoretical Framework

The theoretical framework used to guide this research is rooted in the constructivist theory which consists of two basic ideas. First, constructivist theory suggests that the learner must construct knowledge (Bringuier, 1980). Secondly, the teacher cannot supply the knowledge for the learner, but rather the teacher provides the context in which students will learn (Bringuier, 1980). This is applied through the use of inquiry instruction in which the teacher provides the context of the investigation, where students are encouraged to gather data and utilize existing knowledge to draw conclusions.

Methodology

This study used a descriptive survey research design that contained twenty-one questions based on a summated rating scale (strongly disagree, disagree, uncertain, agree, strongly agree). The instrument used in this study was a researcher-developed instrument that was examined for face validity by a panel of experts at [university] . The instrument was deemed appropriate. Internal consistency was established through a pilot-test and reported a Cronbach's alpha of 0.83.

The population for this study consisted of students from seven National Agriscience Teacher Ambassador Academy (NATAA) participants (N=170). Students were taught IBI through a 12 week study, at the end of the instructional period the survey instrument was administered.

Results/findings

A majority (71.8%) of the students agreed or strongly agreed that "agriscience is useful for solving everyday problems". Furthermore, (88.2%) agreed or strongly agreed that "agriculture is of great importance to a country's development". Nearly two-thirds (60%) disagreed or strongly disagreed that "you can get along perfectly well in everyday life without agriculture". Nearly two-thirds (60.2%) of the students indicated they "would like to have a career in agriculture" and over half (51.9%) noted that most people should study some agriculture (Table1).

A majority (52.3%) of the students reported they would like to take more courses that used IBI, and nearly half (44.2%) of the respondents noted they preferred learning through IBI over other instructional methods.

Table 1
Students' Attitudes about Agriscience (N = 170)

Statement	SD %	D %	U %	A %	SA %
Agriscience is useful for solving everyday problems.	8.2	11.8	8.2	51.8	20
I preferred learning through inquiry over other ways I have been taught in the past.	8.2	15.9	31.7	32.4	11.8
I would like to take more courses that use inquiry-based instruction	15.9	15.9	15.9	44.1	8.2
Agriscience is my favorite class.	8.2	0	24.1	47.7	20
Learning through inquiry was confusing.	15.9	35.9	20	28.2	0
When I think of agriculture, I don't think of science.	15.9	35.9	0	40	8.2
I enjoy working in groups.	8.2	3.6	0	48.2	40
I like using the computer to complete assignments.	0	11.8	8.2	32.3	47.7
You can get along perfectly well in everyday life without agriculture.	24.1	25.9	20	20	0
I feel at ease in the Agriscience classroom.	0	20	8.2	35.9	35.9
When I hear the word agriculture, I have a feeling of dislike.	52.4	23.5	8.2	11.8	4.1
I would like to have a career in agriculture.	8.2	15.8	05.8	40	20.2
Most people should study some agriculture.	8.2	24.1	15.8	47.7	4.2
I like learning new things.	3.5	8.2	8.2	40.1	40
You won't be popular is you like agriculture.	72.4	8.2	7.6	11.8	0
I enjoy doing lab activities in class.	8.2	11.8	0	40	40
I enjoy talk to other people about agriculture.	2.4	8.2	17	40	32.4
Working in groups helps me learn more.	2.4	8.2	17	32.4	40
I have a real desire to learn agriculture.	8.2	8.2	7.7	35.9	40
There is no science taught in my agriculture class.	71.8	24.1	2.4	1.7	0
Agriculture is of great importance to a country's development.	0	0	11.8	36.4	51.8

Note. SD = strongly disagree, D = disagree, U = uncertain, A = agree, SA = strongly agree

Conclusions/Implications/Recommendations

Students responded positively toward agriscience regarding the importance to the country, solving problems used every day, and the need for agriculture in their daily

lives. Furthermore, agriscience students preferred to learn through IBI and are willing to take more classes that utilize IBI in the curriculum. Over half of the respondents that participated in this study indicated they would like a career in agriculture. Though this study is limited to describing only students of NATAA teachers, evidence supports that IBI can build students' agriculture perceptions and the evidence could provide insight into ways IBI can address the need to develop more science-driven students into an agricultural career.

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Taking the University to the People through Cowboy Churches

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Taking the University to the People through Cowboy Churches

Introduction

Cooperative Extension is designed to take research-based information to the people (Rasmussen, 1989). Yet, there is a lack of understanding and appreciation for this service (McDowell, 2004; Abrams, Meyers, Irani, & Baker, 2010). As a result, research recommends Extension to redefine its niche and target audience, to expand and market to more relevant to populations while utilizing modern communication strategies (Kelsey, 2010; McDowell, 2004; Telg, Irani, Hurst, & Kistler, 2007; West, Drake, and Lando, 2009). Cowboy churches are new type of church designed to attract the working cowboy and other individuals who share an affinity to the cowboy and western lifestyle (Williams, 2011). The *National Research Agenda* of The American Association for Agricultural Education recommends scientific focus to determine environments and support systems facilitating in adoption decisions and processes of groups and individuals while identifying factors affecting communication and educational efforts (Doerfert, 2011). Academic research on cowboy churches is limited, providing very little insight to how these churches facilitate change within their respective communities. These churches may serve as a potential audience for Extension.

Purpose of Study

The purpose of this study was to describe cowboy church subject awareness of Cooperative Extension and identify the potential for Extension-cowboy church collaborations.

Theoretical Framework

This study was framed using Rogers' (2003) diffusion of innovations. Partnerships between Extension and cowboy churches are an innovation not yet investigated. Using an acceptability research perspective, the innovation of Extension-cowboy church collaborations, will be evaluated prior to diffusion. Rogers' (2003) five perceived attributes of an innovation aid in determining an innovation's rate of adoption and will be used to evaluate the acceptability for collaborations. The five perceived attributes of an innovation include:

(1) *relative advantage*: degree the innovation is more advantageous compared to others; (2) *compatibility:* consistency of innovation to one's values, experiences, and needs;

(3*) complexity*: degree of difficulty in understanding and implementing innovation;

(4*) trialability:* degree in which an innovation can be experimented; and

(5) *observability*: the visibility of results.

Methods

This study followed a basic, qualitative research design, utilizing a purposive snowball sampling technique (Berg, 2009; Dooley, 2007; Merriam, 2009). Key informants were snowballed from the American Fellowship of Cowboy Churches (AFCC) using a top-down approach. The criterion upon selection required participants to be current ministers, former ministers, and/or secretaries of churches affiliated with the

AFCC. Thirteen informants were identified and ten subjects participated in this study, nine of which were male pastors and one a female administrative assistant. Seven subjects represented the AFCC in an administrative capacity as an officer, board member, and/or field representative. Semi-structured face-to-face and phone interviews were conducted with participants. Interview transcripts were analyzed for recurring patterns and themes. Multiple measures were taken to secure trustworthiness including an audit trail, member checks, a researcher journal, and purposive sampling (Dooley, 2007; Merriam, 2009).

Findings

Subjects were asked three questions to ascertain awareness of Extension. The questions included: What is your familiarity with [State] Extension? Do you know of county agents? Does your church have a 4-H group? In addition to these questions, subjects were asked to express their willingness to collaborate with outside organizations, like Extension. Responses revealed over half of subjects recognized the brand name of [State] Extension. All but one subject indicated awareness of county agents, with one being married to a county agent. Every subject recognized the organization 4-H; however, it was unclear if subjects understood county agents and 4-H were part of Extension. Subjects indicated horses, youth, and wildfire response as primary mediums for collaborating with Extension. Strong interest was expressed for information pertaining to horse health such as shot clinics, while one subject specifically wanted to host the horsemanship clinic put on by local Extension. All subjects indicated some youth participation in either 4-H or FFA. One subject was married to the local FCS and 4-H agent, this agent was described to have conducted programs using the chuck wagon and sewing classes to make leather western wear. In addition, four subjects indicated strong interest to host and/or sponsor livestock shows that would undoubtedly attract both 4-H and FFA youth. More recently, churches have begun responding to wildfires helping farmers and ranchers relocate animals and resource hay. Two subjects described organizing directly with Extension agents for emergency response efforts. Willingness for these churches to collaborate with outside organizations is completely based on mission alignment. Subjects expressed the outside organization and/or message must be culturally relevant, have a respect of the church mission, and allow the opportunity for the church to share the Gospel.

Conclusions

Cowboy church subjects have a general awareness of Extension; however, it is not fully known the extent to which they understand the brand as a whole. Not all cowboy churches of this study openly seek community collaborations; however, those that do, require the outside organization and/or message be culturally relevant and as churches they reserve the right to openly share the Gospel.

Implications & Recommendations

Subject awareness of Extension implies that county agents do not commonly seek out cowboy churches. Collaborations with cowboy churches are advantageous to Extension as they provided an untapped population for programming. The audience structures of churches are compatible to the target audience of Extension; however, complexity lies in that cowboy churches are not yet accessible in every county in the United States. It is

recommended for Extension professionals identify and initiate contact with the cowboy churches in their counties, when applicable. Pastors, a leadership position allocated to men, should be contacted first regarding interest in collaborations as they serve as gatekeepers, controlling the flow of information through the church. Horsemanship, shot clinics, livestock shows, chuck wagon nutrition, and emergency response are recommended avenues for Extension to engage with these churches. Future research should focus on the observability of the proposed means of collaborations, providing case-study analyses.

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Teacher Attitudes toward the National Safe Tractor and Machinery Operation Program: Comparison by Gender, Competition, and Campus Location

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Teacher Attitudes toward the National Safe Tractor and Machinery Operation Program: Comparison by Gender, Competition, and Campus Location

Introduction

According to the National Institute for Occupational Health (2004) agriculture is one of the most dangerous occupations with 25% of farm-based youth fatalities associated with machinery accidents. Tractor overturns were the cause of 101 farm fatalities between 1992 and 2005. Males account for 96% of farm fatalities with 15 year olds being the age with the highest frequency (Hard & Myers, 2006).

The Hazardous Occupations Order for Agricultural Employment designates the operation of farm tractors and machinery as hazardous and restricts the age of operators to 16 years or older unless exempt due to family relationship with the employer or the completion of a tractor and machinery safety program for ages 14-15 (National Safe Tractor and Machinery Operation Program, 2006).

Theoretical Framework

According to Rogers (2003), attitudes toward an innovation affect the rate of adoption through influence during the persuasion stage. In this study, the National Safe Tractor and Machinery Operation Program (NSTMOP) was investigated as an educational innovation. The need, relevance, and value of the NSTMOP, as perceived by secondary agricultural science teachers, were indicative or the adopters' and potential adopters' attitudes toward the innovation.

This study investigated agricultural science teachers' attitudes toward the need, relevance, and value of the Tractor and Machinery Operator Certification Program and compared responses related to teachers' gender, student participation in relevant competitions, and campus location.

Methods

The population consisted of secondary agricultural science teachers in three distinct geographical regions of the state. These regions of the state offered a balance of metropolitan and non-metropolitan school locations in areas of diverse agricultural productivity. A researcher-developed, web-based questionnaire was administered using procedures recommended by Dillman (2007) and field-tested by a group of agricultural science teachers from another region of the state regarding content and ease of completion. Slight revisions to the questionnaire were made, and it was successfully

distributed to 356 recipients. A four-week collection period, with recommended follow-up procedures, yielded a response rate of 38% (n=135).

The following hypotheses were used to guide the study and provide a framework for data analysis and discussion:

H_{O1} There is no significant difference in attitudes toward the Tractor and Machinery Operator Certification Program between male and female teachers.

H_{O2} There is no significant difference in attitudes toward the Tractor and Machinery Operator Certification Program between teachers who have students active in tractor-related competitions and those who do not have students participating.

H_{O3} There is no significant difference in attitudes toward the Tractor and Machinery Operator Certification Program between teachers from metropolitan and non-metropolitan campuses.

Results

The Mann Whitney *U* was used to determine if significant differences existed between teachers based on gender, campus location, and student involvement in related competitions. Significant differences ($p<0.05$) in need, value and relevance of the NSTMOP were found between teacher genders with males displaying more favorable attitudes than females.

Teachers from non-metropolitan campuses rated the need, value, and relevance of the NSTMOP significantly higher ($p<0.05$) than teachers from metropolitan campuses. Teachers who had students competing in Tractor Restoration, Tractor Technician, or Agricultural Mechanics Career Development Events ranked the need, value, and relevance of the NSTMOP significantly higher ($p<0.05$) than teachers without students participating in the same event.

Conclusions

Relevance, need, and interest exist for the NSTMOP in secondary agricultural science programs in the regions of the state that were studied. The relevance, need and interest is greater in non-metropolitan schools, which are in rural areas or small towns. Male teachers, in this study, had more favorable attitudes toward the NSTMOP than female teachers. Teachers whose students participated in tractor-related FFA competitions placed higher need, value and relevance on the NSTMOP than teachers whose students did not participate.

Implications

The potential for teachers to adopt the NSTMOP is greater among teachers in non-metropolitan area because of the perceived higher need, value, and relevance. Since female teachers and teachers in non-metropolitan areas demonstrated less favorable attitudes toward the program, more effort should be made through professional development to demonstrate how this program is also applicable to less traditional audiences in secondary agricultural sciences. Demonstrating relevance to these audiences

through preparation and involvement in tractor-related competitive events may provide a place to start.

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The Impact of School Gardens on the Local School Community

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The Impact of School Gardens on the Local School Community

Introduction

Public school gardens are becoming more and more popular across the US as school systems, educators, and consumers identify a cadre of positive outcomes from planting and harvesting fresh fruits and vegetables. Teachers at all academic grade levels are utilizing open space on their campuses to teach students the science behind our food. School gardens help students understand where food comes from and can help them teach their families how to plant and harvest their own garden to save money and live healthier. School gardens can also help in providing fresh food for the school, cutting spending on vegetables that would otherwise be purchased from a market (Feenstra, 2002). Graham, et al., (2005) state that school systems should implement gardens as a learning laboratory to increase student's attention and enthusiasm for learning.

In addition to providing fresh and healthy food, it has been documented that students who participate in school garden projects have shown increased performance on standardized tests (Graham, et al., 2005). By taking action at the local school level and educating students by a proven means, several national issues can be addressed including obesity, nutrition, and the local economy (Burros, 2009). It is believed that in order to educate the community, children in schools should be educated so they may teach their families at home (Burros, 2009). These concerns coincide with the lack of outdoor education that children need to better understand food and farming (Dillon, et al., 2005). These issues can be addressed by implementing gardens on school campuses (Burros, 2009). One may argue that school gardens are necessary to combat childhood obesity. The use of school gardens allow students to learn about nutrition and healthy eating as well as promoting physical activity (James, et al., 2004). School gardens help with nutrition education by letting the student's plant and harvest the garden while learning which nutrients come from the vegetables and fruit (Morris, et al., 2002).

The main purpose of this study was to determine the overall use of school gardens. The objectives of the study were to identify: The percent of teachers and students involved with school gardens; the resources necessary to establish school gardens; the size of current gardens; the utilization of gardens and garden products in teaching; the extent of community involvement; and, the seasons of the year that gardens are utilized.

Methodology

All middle and high school agricultural education teachers from the 321 agricultural education programs in [state] were invited to participate in an on-line survey. Of the 321 programs across [state], teachers representing 184 programs responded to the on-line survey. This sample represents 57% of the middle and high school agricultural education programs across [state]. Because of the nature of this study, no follow-up emails were sent to non-respondents.

Results

Results indicate that teachers' representing101 agricultural education programs (55%) utilize a school garden and 70 (84%) of those who don't currently have a garden said they

would like to establish a garden at their school. Teachers identified four resources that would aid them in establishing a garden: 1. Fifty percent identified money and grants; 2. Thirty-five percent identified gardening supplies and equipment; 3. Ten percent listed the need for garden construction plans/blueprints; and 4. Five percent identified location on the school campus.

Of those reporting a school garden, size ranged from less than 50 square feet to over 500 square feet. Eighty-one percent of the gardens were less-than 500 square feet. Thirty-four percent of the teachers stated that 50 or more students were involved in the garden project while 37% of teachers reported that 21-50 students were involved. Time spent on the topic of gardening in the classroom varied widely from less than 1 hour per week to more than 5 hours per week with most teachers reporting that time varied depending on the season. Time in the garden mirrored closely the time spent in the classroom on gardening with most teachers spending 1-2 hours a week in the classroom and 1-2 hours per week in the garden. Forty-seven percent of the produce from the school garden was utilized in the classroom in taste tests and 30% was used by students in their homes. However, only 3 percent of teachers reported providing cooking and preparation instruction. Community involvement was strong with 40% of the teachers reporting community partners from groups and individuals such as farmers, parents, other teachers, and students. Spring gardens (41%) and fall gardens (31%) were used most often. Sixteen percent of teachers reported year-round school gardens.

Conclusions

School gardens are popular in agricultural education programs. Over one-half of the programs in [state] have a school garden and another 70 teachers (22%) report they would like to have a school garden. A number of factors limit the use of gardens at some schools. Utilization of the garden produce in teaching is low, especially for instruction in cooking and preparation. Less than 50% of the teachers use school gardens in any one season.

The number of students involved in school garden projects varies widely. This may be due to class size and the number of classes in which the topics relevant to gardening are appropriate. Also, garden size seems small with 81% of the gardens under 500 square feet. Larger gardens would accommodate more students and perhaps allow for individual production areas.

The percentage of partnerships in gardening projects is encouraging (40%). Many community members and other school personnel are involved in the projects. Continued partnerships in classroom instruction on the utilization of vegetables may extend learning to other areas of the curriculum, as well as into the students' homes.

Recommendations

The popularity of gardening in schools across the US presents a unique opportunity for agriculture educators to utilize school gardens in the classroom, as well as partner with community members, organizations and other school personnel. Also, it has been shown that school gardens provide a vehicle to increase student's attention and enthusiasm for

learning as well as increasing test scores. Recommendations from this study are to: Work with school administrators and community leaders to remove barriers to establishing school gardens; Extend the curriculum and garden partnerships into product preparation; and, Enlarge garden plots and extend the season of use to include more students. Teachers may find that the school garden can be a useful teaching tool year-round, and especially in the fall and spring when regular classes are in session.

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Research

The Status of State Curriculum Standards and Curriculum Decision Making

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The Status of State Curriculum Standards and Curriculum Decision Making

Introduction/Need for Research

"Schools must assume the responsibility to develop, plan, and implement curriculum that meet the needs of both students and society" (Finch, 1999). Finch placed the responsibility solely on the school; however, as society becomes more complex, and budgets get tighter the responsibility for curriculum development, planning, and implementation is impacted by many more factors. In the past, agricultural education teachers taught concepts and subjects based upon the needs of the communities in which they taught. With the major push for standardized evaluation and testing, more and more teachers must use a pre-determined curriculum, one that may not truly reflect all the educational needs of the community.

Increased accountability is also greatly affecting education. The passage of numerous pieces of legislation has prompted teachers to feel pressure that all students perform at a certain level. The four major principles of "No Child Left Behind" are: accountability, research-based reforms, parental options, and flexibility (United States Department of Education, 2003). Teachers are held accountable for producing results comparable to other areas across the nation. Research-based reforms refer to those methods that are guaranteed to produce certain results. If a school does not meet the standards, parents have the option to select another school. Flexibility does relinquish a modicum of control back to local schools to make some curriculum choices. The primary focus of the bill, however, is that all teachers regardless of curriculum are responsible for ensuring that their students score well on a *standardized* test.

The purpose of this study was to determine the types of curriculum (state-wide, district, county, etc.) being used in high school agricultural education programs in the United States. It is also beneficial to know who selects the curriculum that is implemented in the classrooms. The information gained from this research study will allow curriculum developers to examine trends occurring in curriculum development within Agricultural Education.

Conceptual/ Theoretical Framework

Curriculum developers need to understand trends related to adopted standards and practices. Priority one of the "Six National Research Priorities" refers to the "Public and Policy Maker Understanding of Agriculture and Natural Resources" (Doerfert, 2011, p. 6). Within this policy there is discussion of how researchers need to "increase their understanding of related message and curriculum development, delivery, method preferences and effectiveness, and the extent of change in audience knowledge, attitudes, perceptions, and behaviors after experiencing an educational program or consuming related information and messages" (p. 6). With the shift of curriculum development moving to a national curriculum, developers need to understand what curricula and procedures states are currently using. Only after establishing the connections and relationships between what is being used nation-wide will curriculum developers be able to successfully advance a national curriculum that will be effective to such a diverse audience. The question that arises is who, ultimately, is responsible for developing curriculum that will meet the needs of agricultural students across a country, which has previously taken pride in curricula flexible enough to meet the needs of the community.

Methodology

An instrument was developed by the researchers and reviewed by a panel of experts in curriculum development and piloted through e-mail to five faculty in agricultural education teaching at the university level in five different states. Changes were made to the instrument as suggested by these reviewers. The instrument was distributed to Agricultural Education State Supervisors at the National FFA Convention State Supervisor meeting on October 17, 2011. Twenty four state supervisors from twenty four different states completed the instrument for a forty-eight percent response rate.

Results/Findings

Approximately ninety two percent of the respondents replied that their state has adopted state standards teachers use to guide their lessons. Fifty percent of those surveyed indicated that their state provided some type of teaching materials to their teachers and seventy percent of states have a state supported website which allows teachers to share resources and materials. Two thirds of the state supervisors perceived that academic integration is very important and that inquiry learning and experimentation is important. Surprisingly four percent thought that inquiry learning and experimentation were not important. Thirty-three percent of the state supervisors indicated textbooks must first be adopted at the state level, while twenty-one percent stated textbooks are first adopted at the local school system. Approximately thirty percent allow teachers to use their own discretion when adopting textbooks.

Conclusions

Almost all states now have state curriculum standards and half of the states are providing instructional materials to help teachers meet these standards. However there is not a similar textbook adoption policy standard occurring at the state level. Many state supervisors made note of certain national curriculum products that are being used in their states to provide teachers with the content needed to meet state standards. A majority of states are also encouraging teachers to share resources and materials to meet content standards in their classrooms. Additionally, the trend of the academic integration of STEM through inquiry and experimentation is currently perceived by state supervisors as an important component of curriculum standards and products.

Implications/Recommendations/Impacts

The trend of state accountability/curriculum standards continues to grow; however, most states are still allowing teachers the flexibility to adopt curriculum materials that align with state standards and are best suited for their communities. Universities should continue to instruct teachers on the basics of the curriculum development process instead of teaching them how to be facilitators of a curriculum product in order for them to be effective teachers in their communities. Curriculum developers should also continue to develop curriculum that integrates STEM and 21st Century Skills.

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Poster Type: Research

UNIVERSITIES GOING SOFT? SOFT SKILL DEVELOPMENT IN UNDERGRADUATES

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UNIVERSITIES GOING SOFT? SOFT SKILL DEVELOPMENT IN UNDERGRADUATES

Introduction/Need for Research

The goal of higher education institutions is to produce quality graduates fully prepared to enter and excel in the workforce. A component of preparation necessary includes the development of soft skills. Soft skills, such as leadership development, communication, problem solving and decision making, are considered crucial for an individual to be successful and to foster career development in today's workforce (Rutherford, Stedman, Felton, Wingenbach, & Harlin, 2004). Corporate Voices for Working Families (2010) states, "the future of American business competitiveness is directly tied to the quality and skills of the current and incoming workforce" (para. 1). Recently, a lack of soft skills in hires directly out of college has been noticed by employers and universities.

Research efforts have been conducted by companies, universities, and coalitions to pinpoint the underdeveloped skills graduates lack, and to discern needed soft skills which should be taught (Birkenholz & Schumacher, 1994; Casner-Lotto & Barrington, 2006; Crawford, Lang, Fink, Dalton & Fielitz, 2011; Rutherford et al., 2004; Schumacher & Swan, 1993). A study conducted by the Association of Public Land-grant Universities found students, faculty, alumni, and employers all agree teaching soft skills should be a shared responsibility between the employer and the university (Crawford et al., 2011). Soft skill development is included to an extent in post-secondary curriculums. However, the realization is that graduates are not entering the workforce fully prepared to successfully compete.

As the research suggests, there is a deficiency of adequate soft skill development for undergraduates within the education system. The evidence suggests more research is essential to fully understand and comprehend the depth and scope of this problem before attempting to address and implement crucial changes.

Conceptual Framework

Research was completed by the [University] to establish where curriculum changes could be made to offer soft skills. An informal questionnaire was presented to a group of undergraduates participating in a university sponsored seminar whom were at various levels in their programs. The study was conducted to determine the development opportunities provided by departments, as perceived by undergraduates.

Methodology

Participants were 25 randomly selected undergraduate students from the College of Agriculture at [University]. An open ended questionnaire was distributed to all participants. Participants were requested to answer the questionnaire based on opportunities available within their majors to develop soft skills including: communication, self-management, professionalism, leadership, decision making/problem

solving, teamwork, and experiences. A mixed methods research design was used for data analysis. Percentages were formulated to determine the prevalence of opportunities to develop each soft skill based on participant responses. Two researchers conducted a content analysis of the responses to determine the soft skill development opportunities available. Comparative coding was used to determine response similarities.

Results

After analyzing the participants' responses, all soft skills were found to be existent in some degree within the College of Agricultural at [University]. Communication skills, professionalism skills, and leadership skills were found to be the most commonly obtained soft skills. However, 48% or greater of all responses indicated there were opportunities available for the development of each soft skill listed. Classes were the most common means for obtaining communication and leadership skills. Seventy-two percent of respondents developed communication skills and 36% gained leadership skills through classes. Forty-four percent of respondents believed professionalism skills were taught through the curriculum of their major. Similarly, 36% of replies attributed the expansion of teamwork skills to group projects. The development of self-management skills was credited by the majority to be gained through learning how to balance their own curriculum and schedules. Decision making/problem solving skills and experiences were mentioned the least amount of times throughout the responses. On the contrary, the variety of opportunities to obtain decision making/problem solving skills and experiences was the highest.

Conclusions

Although some opportunities for soft skill development were found within undergraduate programs, there is still a need for a wider variety of opportunities and the promotion of programs currently available.

Recommendations

Some responses indicated a wide array of opportunities available through majors to develop their soft skills such as extra-curricular activities, attending class, internships, workshops, and seminars. Although a majority of respondents found opportunities to develop communication, professionalism, and leadership skills, institutions should continue to promote the development of these skill sets while incorporating more opportunities for experiences, teamwork, decision making/problem solving, and self-management skills.

A few responses indicated conducting research, studying abroad and volunteering were valuable for developing soft skills. By expanding the accessibility and knowledge of such opportunities, institutions could increase their students' preparedness for entrance into the workforce. Specifically, 32% of responses mentioned group projects as a means of developing leadership experiences. Therefore, faculty should consider altering curriculum

(Rutherford et al., 2004) to integrate more group projects and advanced test questions which require problem solving and decision making.

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