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Socioscientific Issues-based Instruction: An Investigation of Agriscience Students' Argumentation Skills based on Student Variables

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Socioscientific Issues-based Instruction: An Investigation of Agriscience Students' Argumentation Skills based on Student Variables

Abstract

Many researchers in science education have recorded high school student achievement in areas of scientific literacy stemming from socioscientific issues (SSI)-based instruction. The purpose of this study was to describe agriscience students' argumentation skills following a six-week SSI-based instructional unit according to students' grade level, socioeconomic status, and experiences in agricultural education. Results indicated students improved their argumentation quality from pretest to posttest, but students' changes in the number of arguments they offered varied by grade level, socioeconomic status, number of completed agriculture classes, and FFA involvement.

Introduction

With the world's population rapidly growing, agricultural productivity will have to grow with it by increasing yields and the nutritional quality of available foods (Federico, 2005). Even though agriculturalists have made steps toward meeting this future need, the industry has been under fire from the public (Dimitri, Effland & Conklin, 2005; National Research Council, 2009). Perceptions of concern with regard to agricultural practices and related technologies have stemmed from anticipated environmental, food safety, health, and social risks, and persist in the face of scientific evidence supporting the practices in question (World Development Report, 2008). This public concern has led to an ironic situation wherein agriculturalists are responsible for meeting the nutritional needs of a growing population with shrinking resources while overcoming this challenge in ways deemed to be acceptable by the general public. The only way for agricultural production to continue to increase and improve so that future quality and quantity demands are met is for the public to become scientifically literate in order to make educated decisions regarding agricultural technologies (Federico, 2005; National Research Council, 2009).

Although not universally accepted, the concept of scientific literacy has usually referred to public understanding of science and how the public interacts with science to live more effectively (DeBoer, 2000; Laugksch, 1999). The notion of argumentation as a component of scientific literacy has been established by numerous researchers (Callahan, 2009; Duschl & Osborne, 2002; Newton, Driver, & Osborne, 1999; Thoron, 2010; Zeidler & Sadler, 2008). Kuhn (1991) (as cited in Thoron, 2010) defined argumentation skill as "the development of logical explanations and reorganization of opposing assertions, weights of evidence, and determination of merit for each assertion with regards to evidence" (p. 70). The major components of argumentation include articulating and justifying claims, considering counter positions and evidence, and the social negotiation of data and theories (Sadler & Fowler, 2006).

Scientific literacy was identified as the most important goal of science education by the National Science Teachers Association in the 1970s (DeBoer, 2000), and has more recently been included in the purposes, goals, and necessary aspects of science education by the American Association for the Advancement of Science (2009) and the National Research Council (1996). Researchers in science education have focused on socioscientific issues-based (SSI) instruction, a method of instruction that engages students in the multi-faceted decision making process associated with controversial scientific issues in society, as an effective method of increasing numerous aspects

of scientific literacy, including argumentation skills (Dori, Tal, & Tsauschu, 2003; Sadler & Fowler, 2006; Zohar & Nemet, 2002).

While agricultural education has been reported to be an ideal setting for the development of argumentation skills through applicable contexts (National Research Council, 1988; 2009), the practices in secondary agriculture classes have been slow to change, as the same problems regarding increasing scientific literacy have been the focus of agricultural education reform for over 20 years (National Research Council, 1988; 2009). The National Research Council (2009), Association of Public and Land-grant Universities (2009), National Science Education Standards (National Research Council, 1996), and the National Research Agenda (Doerfert, 2011) have called for changes in teaching practices in order to improve student scientific literacy, and recommended the incorporation of real-world, societal issues into instruction as a means of improving scientific literacy.

Numerous researchers in science education have reported student improvement in argumentation skills resulting from SSI-based instruction (Dori et al., 2003; Sadler & Fowler, 2006; Zohar & Nemet, 2002). Many of the issues utilized in SSI-based instruction are agriculturally based (Zeidler, Walker, Ackett, & Simmons, 2002), suggesting that SSI-based instruction in secondary agricultural education classes may improve students' argumentation skills. The problem addressed by this study was the continuing gap between students' scientific literacy skills and those needed to succeed in the workplace and society (Harvard Graduate School, 2011; National Research Council, 1996; 2009), and the search for instructional methods well-suited for secondary agricultural education that show evidence of success for improving student scientific literacy skills.

Theoretical Framework

Dunkin and Biddle's model for the study of classroom teaching (1974) guided this study, which examined changes in agriscience students' argumentation skills after an SSI-based instructional unit (Figure 1). Dunkin and Biddle adapted a model proposed by Mitzel (1960), and grouped thirteen classes of suggested variables into four larger groups of variables within the teaching environment, titled presage, context, process, and product variables.

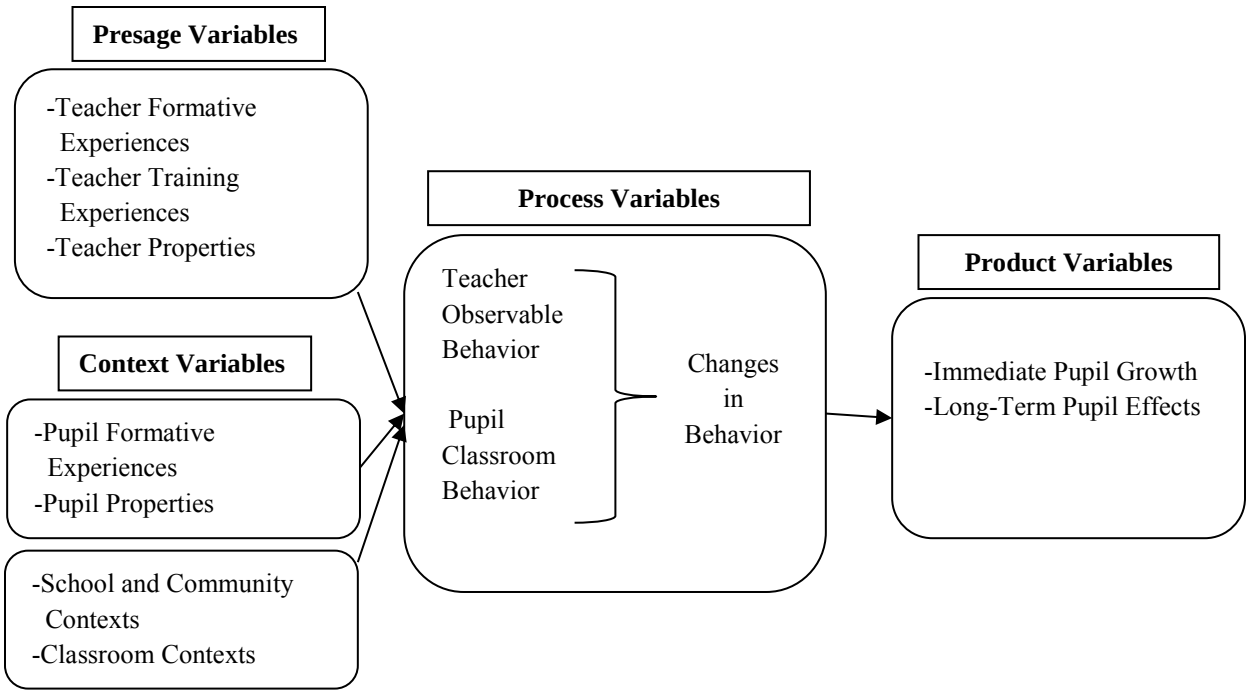

Figure 1 A model for the study of classroom teaching (Dunkin & Biddle, 1974)

Presage variables are defined as variables that teachers bring to the learning environment through their formative experiences, training experiences, and personal properties (Dunkin & Biddle, 1974). Based on teachers' perceptions of and experiences regarding specific SSI topics, classrooms utilizing SSI-based instructional approaches may operate differently from one another. Context variables are uncontrolled by the teacher. They refer to students' formative situations and properties, school and community contexts, and classroom contexts. Similarly to their teachers, students bring influential experiences to the classroom, and these experiences can be impacted by conditions such as home life, socioeconomic status (SES), and physical attributes. Because of its focus on decision-making in the context of controversial issues, SSI-based instruction can impact students differently based on their experiences outside of the classroom (Sadler, 2011). Process variables refer to the interactions between students and the teacher within the learning environment. It is in the learning environment that context and presage variables interact with learning material and the context and presage variables of the other individuals within the environment. Product variables refer to the outcomes of the learning. These variables can include both long term and short term effects of learning on students and teachers, and can refer to outcomes related to knowledge, skills, perceptions, behaviors, actions and others.

Conceptual Framework

The notion of argumentation as a component of scientific literacy to be developed through formal education has been established by numerous researchers (Callahan, 2009; Duschl & Osborne, 2002; Newton, Driver, & Osborne, 1999; Thoron, 2010; Zeidler & Sadler, 2008). Sadler and Fowler (2006) identified the connection between SSI-based instruction and argumentation skills as contextual, stating that "a common assumption underlying [SSI-based education research] suggests that learners' content knowledge related to the SSI under

consideration significantly influences argumentation practice" (p. 3). Utilized in scientific discourse, argumentation includes articulation of justification of claims, offering of counter positions and evidence, and social negotiation of data and theories (Sadler & Fowler, 2006). Toulmin's (1958) works in argumentation and subsequent development of his Argument Pattern (TAP) has provided a framework through which researchers have evaluated argument structure (Sadler & Fowler, 2006; Thoron, 2010). The TAP focuses on argument structure rather than on content (Callahan, 2009) and ranks arguments based on their inclusion of data, claims, warrants, backing, and rebuttals (Toulmin, 1958), and has been utilized as a primary tool in measuring the development of argumentation skills in science education.

In their 2003 study, Dori, et al. operationalized higher order thinking skills as "cognitive activities that are beyond the level of understanding according to Bloom's traditional taxonomy" (p. 771), and chose to measure higher order thinking skills through system thinking, question posing, and argumentation. Students' argumentation skills were measured before and after they engaged in an SSI-based module focusing on biotechnology and genetic engineering, and were analyzed based on student academic level. All students improved in their argumentation skills, averaging an increase in arguments from pre- to posttest of 1.74. Arguments were found to relate with medical, social, and moral aspects most often.

Zohar and Nemet's (2002) study examined the impact of an SSI-based genetic revolution unit on ninth grade Israeli students' argumentation skills through an experimental approach. Students in the experimental group, which engaged in the unit through the genetic revolution material, and those in the comparison group, which engaged in the same genetic principles through a traditional textbook approach, were both assessed through analysis of discussions, products developed during the classes, and written assessments. Arguments were scored according to students' abilities to form an argument consisting of argument formulation, argument alternatives, and rebuttals, along with justification of each. Results indicated that, while students in both groups had similar pretest scores, students in the experimental group significantly improved in their argumentation skills while those in the comparison group experienced no increase in argumentation score from pretest to posttest. Response analysis also indicated that those in the experimental group were able to transfer their argumentation skills to contexts outside of the genetics dilemmas.

Jimenez-Aleixandre, Rodriguez, and Duschl (2000) examined the argumentation skills of one ninth grade class in Spain during six sessions, two of which were SSI-based. Arguments were analyzed according to the argumentative operations and epistemic operations related to the development of scientific knowledge. Using TAP, the authors analyzed arguments for their data, claims, warrants to justify the connection between data and claims, warrants related to theories, qualifiers which state conditions of the claim, and rebuttals, which state conditions for discarding the claim. Epistemic operations were analyzed according a framework developed from other fields and scientific philosophy, and included induction, deduction, causality, definition, classification, use of appeals as explanation, consistency, and plausibility. Qualitative analysis indicated that student groups "developed a variety of arguments, in some cases more sophisticated…than in others" (p. 779). While groups co-constructed arguments, they also experienced unbalanced participation, wherein certain group members contributed the majority of the argument components. In all discussion, claims were the most frequently used aspects of

arguments. Epistemic operations identified in student discussions included causality most often, in addition to analogies.

Tal and Hochberg (2003) assessed the argumentation skills of ninth-grade Israeli students through the use of pre and post open-ended, case-based questionnaires, portfolios, and classroom observations. Although not analyzed quantitatively, the authors found that students' post-test arguments were longer, included more and better structured justifications, and incorporated more knowledge consideration.

In an experimental study examining the impact of an SSI-based unit on eighth-grade student argumentation skills, Osborne, Erduran, and Simon (2004) examined students' discussions using TAP. The experimental group was taught argumentation skills through consideration of whether a new zoo should be built while the comparison group was taught argumentation skills in a scientific context. Each of the six teachers was responsible for teaching one experimental and one comparison class. Results indicated that students in the experimental group engaged in more argumentative discourse than those in the comparison group, "suggesting that initiating argument in a scientific context is harder and more demanding both for students and their teachers, whose responsibility it is to scaffold such discourse" (p. 1007). With regard to the quality of the arguments, results indicated that while the shift was not statistically significant, students in the experimental group did exhibit an increase in their use of higher quality arguments. However, the difference in levels of argumentation between the experimental group and the comparison group was significant, with those in the experimental group exhibiting higher level arguments after their lessons than those exhibited by the comparison group.

Sadler and Fowler (2006) identified several limitations to TAP methodologies in SSI-based education research, despite its routine use. The main limitation of scoring arguments with TAP is the subjective nature of identifying an argument's components: "distinguishing what counts as data, warrants, and backings can be particularly tricky, leaving the reliability of TAP-based assessment schemes questionable" (p. 3). The authors stated that while some researchers have overcome this problem by grouping problematic categories together and focusing on rebuttals, this method is only useful in evaluating group discussions. In a study examining the SSI-based argumentation skills of high school and college students, Sadler and Fowler (2006) developed an Argumentation Quality Rubric in an effort to minimize TAP's limitations. Similar to the TAP, the rubric evaluated argument structure, but focused on claim justification, identified as the "most basic form of argumentation practices" (p. 7). Analysis of student arguments using the Argumentation Quality Rubric resulted in a statistically significant difference between groups; argumentation scores were significantly higher for science majors than for high school students or nonscience majors.

While the impact of SSI-based instruction on students' argumentation skills has been well researched in science education, there exists a gap in the literature with regard to how SSI-based instruction impacts students' argumentation skills within agriscience education. SSI-based instruction is rooted in society, implying that students may be presented with the issue, often within the context of agriculture, before experiencing it in the classroom. Therefore, formative context variables, such as SES and experiences in agricultural education, may considerably impact learning outcomes in SSI-based instructional classrooms. Cheek, Arrington, Carter, and Randell (1994) found that student achievement was positively related to student formative experiences such as FFA participation, number of years enrolled in agricultural education, and

SES. Pupil properties, such as how middle school students differ from high school students (Bong, 2001), can impact learning outcomes differently than in science classrooms, as agricultural education courses frequently contain mixed grade levels. This study sought to add to the knowledge base regarding how the context variables of the agricultural education classroom combines with the process variable of SSI-based instruction to impact student outcome variables related to argumentation skills.

Purpose and Objectives

The purpose of this study was to describe agriscience students' changes in argumentation skills following a six-week SSI-based instructional unit focusing on the introduction of cultured meat into the nation's food supply according to students' grade levels, SES, and experiences in agricultural education. In order to accomplish this purpose, the following objectives were developed:

1. Describe students' number and quality of argument justifications created prior to and following an SSI-based instructional unit.
2. Describe students' number and quality of argument justifications created prior to and following an SSI-based instructional unit based on enrollment in middle or high school.
3. Describe students' number and quality of argument justifications created prior to and following an SSI-based instructional unit based on SES, operationally defined as enrollment in the school free or reduced lunch program.
4. Describe students' number and quality of argument justifications created prior to and following an SSI-based instructional unit based on number of completed agricultural education classes.
5. Describe students' number and quality of argument justifications created prior to and following an SSI-based instructional unit based on membership in the FFA.

Methods

The target population for the study was secondary school agriscience students in [State]. A convenience sample of [State] agriscience teachers was used to access the population. To participate, teachers had to be teaching at least one [Introductory Agriculture] class during the 2011-2012 school year. The classes they taught could consist of students in middle and/or high school. Teachers attending the [State Association] Teachers and regional FFA Chapter Officer Leadership Conferences were recruited to attend training sessions related to this study.

While the use of SSI-based instruction in science education has been documented and has therefore begun the process of theory construction, a theory establishing the use of SSI-based instruction in agricultural education has not yet been built; the use of SSI-based instruction has not yet be documented in agricultural education. Because this study followed a theory building nature, a pre-experimental, single group pretest-posttest design was utilized; a true experimental or quasi-experimental design was not deemed appropriate. Theory building, "the purposeful process…by which coherent descriptions, explanations, and representations of observed or experienced phenomena are generated, verified, or refined" (Lynham, 2000, p. 161), is led in design by the nature and development of the theory rather than by a researcher's desired type of questioning (Lynham, 2002). The single group pretest-posttest design is susceptible to numerous internal validity threats. Five threats were identified by Campbell and Stanley (1963): history,

maturation, testing, instrumentation, and interaction of selection and other threats. Threats to history were addressed with the use of multiple classrooms during treatment. Threats to maturation were reduced in the study through the selection of agriculture education as a class subject since the field contains a wide range of student ages and different maturation based on those ages. There were no threats to instrumentation because the pretest and posttests remained the same before and after treatment. Interaction of selection and other threats was reduced with the collection of covariate data from multiple classrooms to control for differences between classrooms. Fidelity of treatment was met through a professional development session to train teachers in the use of the SSI-based instruction (Boone, 1988; Hennessey & Rumrill, 2003). Selection of content posted a "concern with conducting a study utilizing specific teaching methods' (Thoron, 2010, p. 91). A panel of experts from [University] [Department] examined the lesson plans and content used and deemed they were appropriate for the grade level and subjects. Generalizations of the findings in this study were limited; however, the ability to make generalizations was not a primary goal of the research since its intended nature was that of theory building.

The study's intervention contained lessons that taught agriscience material with an SSI method. The material consisted of three instructional units, with each investigating the SSI (whether cultured meat should be introduced into the nation's food supply) from a different point of view: (a) food safety, (b) economic impacts, and (c) environmental impacts. The study used 30 researcher-made lesson plans to be used in 45-minute classes.

Researchers provided audio recorders and instructions to be used by teachers for each session so that 25% of the recordings could be used to further ensure treatment fidelity (Thoron, 2010). Lessons had to be 80% aligned with the study to be deemed appropriate, and teachers with 90% of their lessons meeting alignment were allowed to be included in the study. Teachers were also required to take daily attendance logs. Classes that were missing over 25% of its students were deemed unacceptable and removed from the study. Despite weekly reminders, teachers failed to consistently record their class sessions citing forgetfulness and technical difficulties as their justification. Teachers also forgot to consistently record and share attendance records. Since the mortality rate of students receiving instruction was not proven to be below 25%, this is considered a limitation in the study. However, student work submitted to the researchers throughout the study indicated that classes were well attended.

Students' argumentation skill was assessed using an Argumentation Quality Rubric, which scores open responses to SSI scenarios on a scale of 0 ("No Justifications Provided") to 4 (Justification with Elaborated Grounds and Counterposition) (Sadler & Fowler, 2006). The rubric was designed to address the limitations of Toulmin's Argumentation Rubric (TAP) (1958) which had been used in similar SSI-based education studies. The rubric surpasses the challenge of accurately categorizing claims, warrants and backings by focusing only on the justification of claims, which is a fundamental factor to argumentation (Sadler & Fowler, 2006). Reliability of the rubric was established by Sadler & Fowler (2006) through the use of multiple scorers, which resulted in an inter-rater consistency above .9. Students responded to researcher-developed scenarios directly related to SSI intervention in a paper-based open response format. The scenario remained the same from pretest to posttest, and was reviewed by a panel of experts in agricultural and science education for face and content validity. Scores were calculated by researchers in the [University] [Department]. The primary researcher individually scored each

response. Scores on 10% of the responses were reviewed and confirmed by a secondary researcher, which resulted in an inter-rater consistency score of 1.0 (Lincoln & Guba, 1985).

Findings

After initial contact, approximately 40 teachers attended the training sessions that were created to inform potential participants about the study. After the meeting, 11 teachers showed interest in participating in the study and signed consent forms, which lead to a total of 672 students available to participate in the study. After repeated contact with the researcher, seven teachers requested to be removed from the study due to problems during the school year. Four teachers' classes completed the duration of the study. Despite frequent contact, however, two teachers did not send in all of the finished instruments. A total of 633 students were removed from the study following their initial consent, resulting in a mortality rate of 94.20%. Therefore, a total of 39 students completed both pretests and posttests (see Table 1). This mortality rate is considerably higher than others that have been reported in previous experimental studies in agricultural education using intact classes (Jurs & Glass, 1971; Thoron, 2010), reducing the generalizability of this study beyond its participants. Only those students with both pretest and posttest scores were included in the data analysis.

Table 1

*Number of Students per Objective Variable Completing Each Argumentation Assessment (*N=*39)*

Objective Variable	Number of Students Completing Assessment (*n*)				
	Overall	Pretest Number	Posttest Number	Pretest Score	Posttest Score
All Students	39	39	39	39	39
Grade Level					
Middle	28	28	28	28	28
High	10	10	10	10	10
Free/Reduced Lunch Status					
Enrolled	18	18	18	18	18
Not enrolled	16	16	16	16	16
# of Completed Agriculture Classes					
1-2	35	35	35	35	35
3-4	2	2	2	2	2
FFA Membership					
Member	28	28	28	28	28
Nonmember	10	10	10	10	10

Students' Number and Quality of Arguments

The first objective was to describe students' number and quality of argument justifications created prior to and following an SSI-based instructional unit. There were a total of 39 students who completed both the pretest and posttest. The students' mean number of justifications on the pretest scenario was 2.15 (*SD* = 0.86), while the mean number of justifications on the posttest

decreased by 0.05 to 2.10 (*SD* = 0.94). Students' pretest justification quality had a mean score of 1.62 (*SD* = 0.75) while their posttest mean score increased by 0.56 to 2.18 (*SD* = 1.02).

Argumentation Skills based on Enrollment in Middle or High School

The second objective was to describe students' number and quality of argument justifications created prior to and following an SSI-based instructional unit based on enrollment in middle or high school. There were a total of 28 students who indicated they were in middle school classes and 10 who indicated they were in high school classes. Of the 39 students submitting argumentation pretests and posttests, one did not supply grade level information. Middle school students' pretest mean number of justifications was 2.07 (*SD* = 0.81), while their mean number of justifications on the posttest decreased by 0.21 to 1.86 (*SD* = 0.89). High school students' pretest mean number of justifications score was 2.30 (*SD* = 1.06). Their posttest mean number of justifications increased by 0.50 to 2.80 (*SD* = 0.79). Middle school students' mean justification quality pretest score was 1.79 (*SD* = 0.79), while their mean posttest scores increased by 0.07 to 1.86 (*SD* = 0.80). High school students' mean justification quality pretest scores was 1.20 (*SD* = 0.42), while their posttest mean score increased by 1.80 to 3.00 (*SD* = 1.15).

Argumentation Skills based on SES

The third objective was to describe students' number and quality of argument justifications created prior to and following an SSI-based instructional unit based on SES, operationally defined as enrollment in the school free or reduced lunch program. Out of 34 students indicating their enrollment status, 18 were enrolled in a free or reduced lunch program, while 16 were not. Free or reduced lunch students had a mean score of 2.39 (*SD* = 0.85) on their number of justifications pretest, while they had a reduced mean number of 2.11 (*SD* = 0.96) on their posttest. Students who did not have free or reduced lunches had a mean number of 1.94 (*SD* = 0.85) justifications on the pretest, while they had an increased mean number of 2.13 (*SD* = 1.02) justifications on the posttest. Students enrolled in a free or reduced lunch program had a mean quality of justifications pretest score of 1.67 (*SD* = 0.69), while their score increased by 0.61 to 2.28 (*SD* = 0.96) on the posttest. Non-free or reduced lunch students had a mean score on their quality of justifications pretest of 1.56 (*SD* = 0.81), while their mean score increased by 0.44 to 2.00 (*SD* = 0.97).

Argumentation Skills based on Number of Completed Agricultural Education Classes

The next objective sought to describe students' number and quality of argument justifications created prior to and following an SSI-based instructional unit based on number of completed agricultural education classes. Since only two students had completed more than two agricultural education classes, two groups were created for analysis: students that had completed one to two agricultural education classes and students that completed three to four classes.

Students who had one to two previous agricultural education classes had a mean number of justifications of 2.17 (*SD* = 0.89) on the pretest and a decreased mean posttest number of 2.09 (*SD* = 0.89). Students with three to four previous agricultural education classes had a mean number of justifications of 2.50 (*SD* = 0.71) on the pretest, with an increased posttest number of 3.50 (*SD* = 1.31). Students with one to two agriculture classes had a mean quality of justification

pretest score of 1.54 (*SD* = 0.66), with an increased posttest score of 2.09 (*SD* = 0.98). Students with three to four previous agricultural education classes had a mean quality of justifications pretest score of 1.50 (*SD* = 0.71), with an increased mean posttest score of 3.00 (*SD* = 1.41).

Argumentation Skills based on FFA Membership

The final objective described students' number and quality of argument justifications created prior to and following an SSI-based instructional unit based on membership in the FFA. Out of 38 students, 28 were members of the FFA while ten were not members of the FFA. Students who were FFA members had a mean number of pretest justifications of 2.07 (*SD* = 0.86), while their mean posttest number remained at 2.07 (*SD* = 0.94). Students who were non-members had a mean pretest number of justifications of 2.40 (*SD* = 0.97), while their mean number on the posttest decreased to 2.30 (*SD* = 0.95). Students who were FFA members had a mean quality of justifications pretest score of 1.68 (*SD* = 0.67), while their mean posttest score increased to 2.18 (*SD* = 0.98). Students who were non-members had a quality of justifications pretest mean score of 1.20 (*SD* = 0.42), while their mean posttest score increased to 2.20 (*SD* = 1.23).

Conclusions and Implications

From the findings, researchers drew numerous conclusions regarding the effectiveness of SSI-based instruction in impacting student argumentation skills. Objective one examined students' overall argumentation skills after receiving SSI-based instruction. Students were found to have a decreased mean number of justifications on the posttest compared to the pretest. However, from pretest to posttest, the mean quality score of their justifications increased. While findings related to the increase in justification quality are supported by previous research (Dori et al, 2003; Tal & Hochberg, 2003; Zohar & Nemet, 2002), the finding that students did not display gains in the number of argument justifications offered is contradicted by Tal and Hochberg's (2003) study, implying that external factors may have impacted students' abilities to supply an increased number of justifications in the current study. These external factors may include perceived time or space limitations when writing justifications, or writing fatigue on the part of the respondents.

Objective two examined students' argumentation skills in relation to grade level after receiving SSI-based instruction. Middle school students' quality of justifications pretest score was higher than high school students. This difference could imply a greater level of motivation among middle school students to perform on school tasks (Bong, 2001), an aspect of argumentation that has not yet been fully examined in SSI-based instruction research. Findings showed that regardless of student age, the quality of their justifications increased. However, the mean increase of the quality of justifications was greater among high school students than among middle school students. Middle school students also displayed a decrease in the number of justifications from pretest to posttest, which was not observed within the high school students.

Objective three examined students' argumentation skills based on SES, which was determined by their enrollment in a free or reduced lunch program. Regardless of enrollment status, students displayed an increase in the quality of their justifications from pretest to posttest. Students enrolled in a free or reduced lunch program displayed a greater mean score increase from pretest to posttest than those students who were not enrolled in a free or reduced lunch program. These results align with Dunkin and Biddle's (1974) theory, which states students' learning is influenced by their context variables, including SES.

Objective four examined students' argumentation skills based on the number of previously completed agricultural education classes. Students displayed a mean increase in quality of justifications regardless of the number of previous agricultural education classes they had completed. Students that had completed three to four previous agriculture classes had a higher mean increase in quality than students that had only taken one to two previous classes. These findings may be skewed by the great difference between the number of students in each group; the majority of students in the study had only taken one to two previous agricultural education classes while only two students had taken three to four previous classes. However, Dunkin and Biddle's (1974) theory states that formative experiences can impact students' learning, implying that students with more formative experiences in agricultural education may have been better equipped with agricultural knowledge to support their arguments.

Objective five sought to describe students' argumentation skills based on their FFA membership. The findings showed that regardless of membership status, students' mean quality of justifications increased from pretest to posttest. However, students that were not FFA members had a greater mean increase in their quality of justifications than students that were FFA members. This finding contradicts those of Cheek, et al. (1994), which state that student achievement was positively related with FFA participation.

Findings displayed that while SSI-based instruction did improve students' quality of justifications, their number of justifications decreased. This difference in score change may be from confounding factors such as perceived time permitted, writing skills, and students' motivation. Students may have not had adequate time or space to provide more justifications on their tests, which would have hindered their number of justifications. High school students could have had a higher level of writing skill, which would allow them to give better quality justifications than middle school students in the testing format provided.

Limitations of the study prevent generalizations from being made to populations beyond the study. Limitations of this study included the high attrition rate and resulting small sample of students participating in and completing the study, inconsistent group sizes within each objective, confounding variables such as student and teacher fatigue, and potential strong relationships between variables such as number of completed classes and grade level. While generalization is strongly discouraged, these findings can be useful in furthering understanding of how SSI-based instruction may impact different groups of students, as well as assisting researchers with the appropriate design of future studies regarding SSI-based instruction in agricultural education.

Recommendations

Previous research had found that SSI-based instruction can be considered an advantageous method in generating student knowledge in science education, although it remains a novel, sparsely-researched teaching approach in agricultural education. Like any introductory study, further research is needed to overcome limitations and further interpret preliminary findings. The results of this study show that while SSI-based instruction may positively impact agriscience students' argumentation skills, that impact may differ among students and classes. Teacher variables could have played a part in each classroom involved in the studies and their usage of SSI-based instruction (Duncan & Biddle, 1974). Presage variables such as previous education and training, and personal views of the SSI could have altered students' argumentation skills.

Further research should be conducted to examine the influence of presage variables on classroom behaviors and student outcomes during SSI-based instruction. The study also warrants further research on the impacts of student-related context variables, such as SES, membership with FFA, and agricultural education experience on learning during SSI-based instruction. Characteristics of the materials provided such as the order of lessons, SSI topics, and duration of the lessons could impact students' scores and should be subject to further study, as there are no best practices recommended by researchers in SSI-based instruction (Sadler, 2009).

The findings from this study present further recommendations to agriculture teachers. Teachers should select appropriate SSI topics based on student factors, such as SES, experience in agricultural education and the field of agriculture, and FFA membership, since argumentation scores for each of these factors differed. While further research is needed in this area before additional recommendations can be made, the findings of this study support careful consideration of student backgrounds and experiences when selecting appropriate SSI topics and aspects.

Finally, recommendations can be made regarding FFA recruitment. The strong overlap between FFA events and the agricultural aspects of many SSIs warrant the incorporation of FFA activities into SSI-based instruction in agricultural education. Nonmembers displayed higher quality arguments on the posttest than FFA members; in order to benefit the FFA aspects of agricultural education programs, recruitment efforts should be increased to incorporate these students. This effort may require that teachers and researchers examine potential differences between these groups that may impact both interest in being an FFA member and argumentation skills. Researchers should also determine if other skill differences exist between members and nonmembers that may impact learning during SSI-based instruction.

The study's findings indicate that SSI-based instruction is effective in increasing secondary agriculture education students' argumentation skills. The findings, coupled with previous research, give recommendations to future and current teachers, curriculum makers, and researchers that could potentially be beneficial to developing further knowledge about SSI-instruction in agricultural education. This study also carries the potential to be replicated in other states or areas of instruction to evaluate the impact of SSI-based instruction in the classroom.

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Migrants, Farming, and Immigration: Beginning a Dialogue in Agricultural Education

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Migrants, Farming, and Immigration:
Beginning a Dialogue in Agricultural Education

Abstract

Based upon quantitative survey data from 359 students, aged thirty or younger, at a large, state university that serves a relatively balanced rural / urban population, this manuscript outlines what Southern young people, particularly young educators, think they know and what they believe regarding the workers who are essential to their daily diet of fruits and vegetables: America's immigrant and migrant farm workers. The participants' attitudes are compared and contrasted with their relevant life experiences and backgrounds such as: gender, race / ethnicity, political affiliation, and agricultural experience. Using a factor analyses, significant clusters of semantically and statistically valid background experience subgroups and participant attitudes are extracted from the survey data. These explanatory factors are then cross-referenced to map out crucial and often surprising differences and similarities in the knowledge and attitudes of various sub-populations including: teachers, young people with farm work experience, and self-identified political groups.

Introduction and Theoretical Framework

For decades the U.S. Department of Labor's National Agricultural Worker Survey has consistently documented that 70% of U.S. farm workers were born outside the U.S., mostly in Mexico (Carroll, Georges & Saltz, 2011). Current anti-immigrant politics notwithstanding, this is not likely to change soon. Despite the rise of agricultural technology, there are many things machines and robots still cannot do as fast, as efficiently, or as carefully as a human. Moreover, most native-born Americans are not willing to pluck tomatoes all day in the hot sun or chase chickens through a barn full of excrement for sub-poverty wages (Smith, 2010; Thompson, 2011; Case, 2013). Thus, for the foreseeable future, American farmers, ranchers, agribusiness people, grocers, and consumers will all continue to depend upon immigrants to provide them with the labor, crops, and produce that keep them in business and well-fed.

However, as Rothenberg (1998) writes: "Like so many consumer products, fruits and vegetables appear before us as if by magic . . . Few people realize that virtually every vegetable or piece of fruit we eat was handpicked by a farm worker, a member of our nation's poorest and most disadvantaged class of laborers" (p. xiii). This is because our society erases the experience of migrant farm workers, as documented by analyses of cultural representations of farming, migrant farm workers, immigrants, and Latinos (Hoffman & Daniels, 1995; Barerra, Quiroa & West-Williams, 1999; Kruse, 2001; Lamme, Fu & Lowery, 2004; McGlinn 2004; Salinas & Fránquiz, 2004b; Jack, 2005; Nilsson 2005). As Beck (2009) states, for most Americans, "migrants are hidden behind heroic…, oversimplified, and culturally iconic white farmers such as Mr. Greenjeans, *Farmer Wants a Wife,* and Playskool's suspender-wearing figurines" (p.100). Meanwhile, those of us who have worked in agriculture scoff at Paris Hilton's *The Simple Life* and the lack of Latinos in Dodge's *God Made a Farmer* commercial (Varela, 2013).

More disappointingly, despite the fact that the majority of U.S. farm labor is done by immigrant and/or migrant farm workers (Carroll, Georges & Saltz, 2011), this erasure and silence extend to

agricultural education. A search for research regarding immigrant and migrant farm workers published since 2000 in significant U.S. agricultural education journals is nearly fruitless, with most references occurring only in passing (Hurst & Sperry, 2000; Kelsey, Weeks & Terry, 2002; Ortega et al., 2003; Rich et al., 2009). One exception is a 2006 *NACTA Journal* article by Mullinix et al. revealing a somewhat surprising desire among Latino farm workers for careers as agriculturalists. The only other examples are a handful of articles in the *Journal of Extension* regarding adult health/safety outreach efforts targeting migrants (Viramontez-Anguiano, 2001; Driscoll, 2003; Lobley & Peronto, 2007; Wallace, 2008; Baker & Chappelle, 2012).

This lack of acknowledgement of migrancy in agricultural education research is not surprising. The daily lives of migrant farm workers include harsh realities that many teachers, even agriculture educators, would rather avoid addressing: the dangers of immigration and the border; substandard housing; exhausting, unhealthy work conditions; children and child labor in fields and barns; continual movement and disrupted schooling; and the grievous inequity of the U.S. economy (Valle, 1994; Rothenberg, 1998; Beck, 2003; Martin, 2003; Beck, 2004; Salinas & Fránquiz, 2004a; Mantero, 2008; Owens, 2008; Thompson & Wiggins, 2009; Holmes, 2013)

However, given the absolute dependence of our agricultural system upon immigrant and migrant labor, today's politics of nativistic policymaking, and the rapid growth of the rural South's Latino population (Murphy, Blanchard & Hill, 2001; Murillo, 2002; Villenas, 2002; Fink, 2003; Smith & Furuseth, 2006; Odem & Lacy, 2009; Marrow, 2011), it is more important than ever for educators, especially agriculture educators in this region, to understand, confront, and counter the stereotypes regarding immigrants and migrant labor held by their colleagues and students.

Agriculture educators can build new understandings of migrancy within the community of teachers. With broader understandings, it is reasonable to expect teachers to have more positive attitudes about migrant children, attitudes that will lead to better academic outcomes for the students (Brophy & Good, 1974; Whittaker, Salend & Gutierrez, 1997; Walker, Shafer & Iiams, 2004; Gay, 2010). Agriculture educators also have direct influence upon tomorrow's farmers: today's agriculture education students. The voices of farmers who employ migrants can be very persuasive in helping mainstream Americans understand our dependence on migrancy. But they can only raise their voices if they are well-informed by their teachers, agriculture educators.

Purposes and Objectives

Agriculture educators cannot work toward these goals without a baseline assessment of what teachers and young people think and believe about immigrants and migrants. Thus, the purpose of this study is to map the attitudes of youth Southerners – educators and non-educators – regarding immigrant and migrant laborers in agriculture, to begin answering questions such as: What do young Southerners, including the next generation of teachers, think and believe about migrancy? What background experiences and demographic factors impact their beliefs and opinions? This study collected data regarding the participants' backgrounds, experiences, knowledge, and attitudes and then used statistical methods to address the following objectives:

1. Describe the participants' demographics and identify background experience subgroups;
2. Describe the participants' attitudes regarding migrancy, farming, and immigration; identify the most and least controversial issues and those that educators view differently;

3. Analyze the responses along a liberal-conservative spectrum and describe the participants' political orientations regarding the issues at hand;
4. Analyze participants' responses for underlying attitude factors;
5. Identify noteworthy correlations between participants' demographics and experiential subgroups – and – their attitude response factors.

Participants, Methods and Procedures

The participants in this study were volunteers from the primary researcher's college courses between 2011 and 2013. Many of these courses focused on language arts methods for teachers. However, participants were also drawn from his freshman seminars regarding farming, immigration, and migrancy. Of the approximately 465 potential participants, 410 gave permission for their data to be included in this study. Of these, 359 fell below the 30 year-old cut off for this manuscript's focus upon young people.

At the beginning of each course, the primary researcher provided his students with both a verbal and written description of the study, explaining that their participation or non-participation would neither raise nor lower their grade – nor would it increase or decrease their workload for the course. Students chose whether their data would be included in the study and completed a two-part online survey. The first section included 19 questions documenting their personal demographics and background experiences (age; gender; ethnicity/race; travel; language ability; agricultural experience; family income, politics, and history of immigration/migration).

The second part of the survey focused upon participants' attitudes regarding immigration and migrant farm worker issues. This part consisted of 51 prompts to which the students responded on a five-point Likert scale extending from "strongly agree" (1) to "strongly disagree" (5), with the middle (3) as "neither agree or disagree." The statements were intentionally provocative and reflected opinions found at both ends of the political and rhetorical spectrum, for example: "People in the USA without documentation should be protected by our laws" versus "Our country needs to deport all the illegal aliens right away." The repugnant term "illegal alien" was included in some prompts to accurately reflect the terms of the debate. Data collection began over a year before the Associated Press shifted its policy regarding the term (Haughney, 2013).

The prompts were screened by the second researcher, an immigrant to the U.S. with a strong background in multicultural issues and quantitative research, for content validity and accuracy in reflecting real-world opinions about these issues. For each item on the survey, participants were allowed to not answer if they felt uncomfortable. Nonetheless, only 1.8% of the total possible responses were left unanswered by the participants, indicating a very high level of participation.

Findings

Objective 1: Participant Demographics & Experiential Subgroups

As Table 1 shows, 53% of the participants were drawn from teacher education courses, and because of the predominance of women in the field of teaching, the sample is weighted 2 to 1 toward female participants. Eighty percent of the sample was from families who had been in

Georgia for at least one generation, with more than a third tracing their Peach State roots back to the 1800s. As mostly native Georgians, the sample reflects the state's current status as a red state, with a near majority, 44%, self-identifying as Republicans, Conservatives, or Tea Party members. In comparison, a 2011 poll of registered Georgia voters showed a Republican / Democrat / Independent breakdown of 38 / 35 / 27% (Davis & Stirgus, 2012). Thus the study sample was somewhat more conservative than the state's electorate, a fact explained by the underrepresentation of traditionally left-leaning populations. African Americans only account for 19% of the sample, while they are 31% of the state's populace, and Latinos are only 5% of the sample as compared to 9% of the state (U.S. Census, 2013).

Note that, although Libertarians often agree with conservative perspectives, when asked about immigration issues, the self-identified Libertarians in our sample tended strongly toward liberal opinions. This can be explained by Libertarians' preferences for non-regulation and free-market policy making (Pew Research, 2014).

Table 1: Demographics of Participants

	Field of Study:	Educators		Non-Educators		All	
Characteristic of Participant:		*N*	%	*N*	%	*N*	%
Academic Level	Undergraduate	158	83	169	100	327	91
	Graduate	32	17	-	-	32	9
Age	Under 20	75	40	142	84	217	60
	21-25	86	45	26	15	112	31
	26-30	29	15	1	-	30	9
Gender	Female	166	87	72	43	238	66
	Male	24	13	97	57	121	34
Family Generations in GA	1-2	53	28	72	43	125	35
	3-5	54	28	44	26	98	27
	Earlier	78	41	50	30	128	36
Hometown	Urban	14	7	20	12	34	9
	Suburban	64	34	64	38	128	36
	Small Town	66	35	49	29	115	32
	Rural	44	23	31	18	75	21
Family Income	< $30,000	18	9	9	5	27	8
	$30 -100K	101	53	76	45	177	49
	> $100,000	33	17	41	24	74	20
Self-ID Politics	Democrat /Liberal/Libertarian	55	29	34	20	89	25
	Independent	22	12	23	14	45	13
	Republican/Conservative/Tea	81	43	77	46	158	44
Race/Ethnic	White/White American/American	158	83	110	65	268	78
	Black/African American	34	18	36	21	70	19
	Native American	9	5	10	6	19	5
	Latino / Hispanic	7	4	12	7	19	5
	Asian &/or Middle Eastern	4	2	7	4	11	3

Non-responses have been excluded from table, but counted in the calculation of percentages

Although 25% of Georgians live in the state's fourteen metropolitan center counties, only 9% of

the sample was urbanites. Instead, small town natives are overrepresented in the sample at 25%, when only 10% of Georgians live in such areas (U.S. Census, 2010; UGA CFCS, 2014). Regarding family income, almost 19% of Georgia's families live on an annual income of less than $25,000 (U.S. Census, 2014). However, only 8% of the sample estimates their family income under $30,000, reflecting the fact that enrollment in four-year college programs is not a feasible financial possibility for many impoverished Americans (Pew Research, 2014).

Background prompts with especially high and significant Pearson correlations (greater than .300) with each other – indicating possible underlying latent variables – were used for a Principle Component Factor Analysis. This analysis demonstrated that 49.7% of the prompts' total variance could be explained in terms of four sensible latent variables: White Conservatives, Rural Aggies, Non-Cosmopolitans, and Female Teachers. The four rotated factors emerged from an Oblimin Rotation ($\Delta = 0$) with Kaiser Normalization and Anderson-Rubin scoring. Table 2 describes the four factors and names them as background subgroups according to the underlying experiences with which they most strongly correlate positively or negatively.

Table 2: Background Factor Subgroups and Correlating Demographics/Experiences

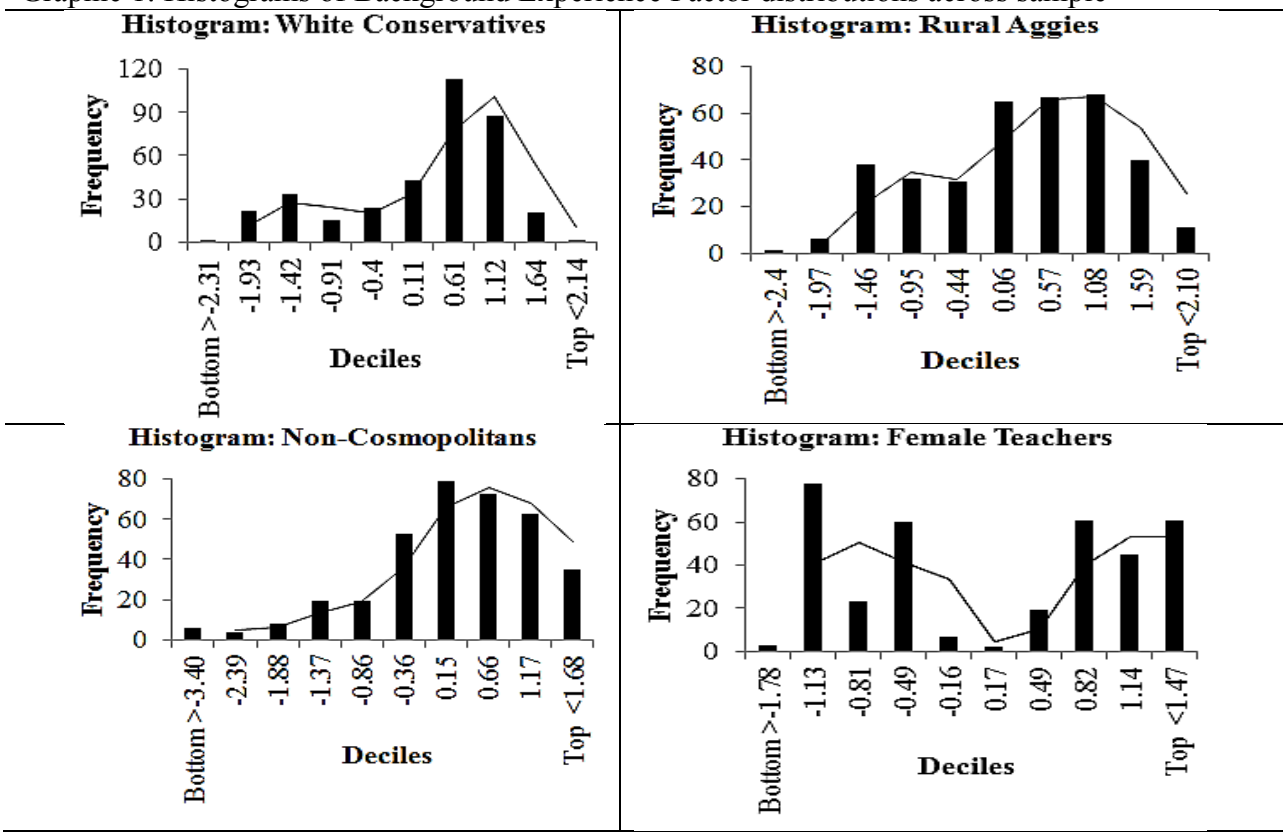
Background Experience Subgroups : *Characteristics:*	White Conservatives	Rural Aggies	Non-Cosmopolitans	Female Teachers
Non-White Race/Ethnicity	**-.877****	*-.212***		
Mother Liberal Politics	**-.787****	*-.173***		
Father Liberal Politics	**-.754****	*-.168***		
African-American/Black self-ID $^{\rho}$	**-.673****	*-.192***	*.184***	
Student Liberal Politics self-ID	**-.654****		*-.168***	
White self-ID $^{\rho}$	**.630****	*.272***		*.139***
American self-ID $^{\rho}$	**.580****			
Family Income	*.226***			
Non-GA Crops Correct		**.815****		
GA Crops Correct		**.776****	*.152***	*.172***
Hand Labor Crops Correct		**.710****		
Rural Hometown		**.546****	*.202***	
Agricultural Work Experience	*.180***	**.485****		
Generations Since Farm Family	*-.153***	-.350**		
Spoken w/ Migrants	*.146***	.343**	-.273**	
Speak Language other than English	*-.175***		**-.769****	
Spanish Fluency			**-.718****	
Travel Out of the US	*.162***	*-.179***	**-.629****	
Spanish Friends			**-.580****	
Generations since Immigrant Family		*.193***	**.455****	
Travel Out of the South	*.183***	*-.168***	**-.448****	*-.203***
Latino/Hispanic self-ID $^{\rho}$	*-.150***		-.249**	
Generations of family in Georgia	*.143***	*.199***	.213**	
Educator $^{\rho}$		*.136***		**.855****
Female $^{\rho}$				**.683****

All Pearson, except $^{\rho}$ *= Spearman;* ***=significant at 0.01 level; all are 2 tailed*

Note that the "Non-White Race/Ethnicity" characteristic listed here is a compound variable intended to account for participants with multiple race/ethnic identities. The variable ranges from 2 to -2 such that a participant self-identifying as both Black and Asian, for example, would score 2, while another participant self-identifying as White and American would score -2, and a Black and White participant would total 0. American and White were treated as the equivalent ethnic/racial identities for our purposes because census data shows that racially "White" Southerners increasingly self-identify ethnically as only "American" (U.S. Census, 2004).

As would be expected from a factor analysis, these four background factor subgroups stand largely independent of (nearly orthogonal to) each other. The only exception being a small .160 Pearson correlation (significant at the .01 level) between the White Conservative and Rural Aggie factors. All four background factors have $M = 0$ and $SD \approx 1$. The histograms in Graphic 1 display the distribution of the factors across the entire sample.

Graphic 1: Histograms of Background Experience Factor distributions across sample



Objective 2: Attitudes, Most & Least Controversial Prompts, Educators' Responses

The 51 prompts (*N* range 347 to 359; listwise valid *N* = 283) are listed in Table 3 sorted by mean (*M*) response, ranging from agreement at *M* = 1.79 to *M* = 3.92, disagreement. The statements with the strongest levels of agreement tended to be either demonstrably factual or regarding the children. Most of the prompts with high rates of rejection exemplify some of the strongest anti-immigrant rhetoric currently popular on the right-wing of American political discourse. The *Note* column includes a variety of codes regarding individual prompts:

CS = Consensus prompt: small *SD* (.692 to .828) and high skewness (.350 to .855).

CT = Controversial: large *SD* (1.061 to 1.309) and large negative kurtosis (-.855 to -1.168).

ED = Educators disagreed at notably higher rate (difference of M > .300).

Note that the AF (Attitude Factor) column will be explained below in Objective 4.

Table 3: Mean Responses to Attitude Prompts

Prompt *(some abbreviated)* 1=strongly agree, 5=strongly disagree	*M*	*SD*	*Note*	*AF*
Hard work is good for you and should make you proud.	1.79	0.81	*CS*	*tv*
Pesticide poisoning causes farm workers long-term health problems.	1.83	0.69		
Undocumented children that are in the USA will likely be here as adults.	2.04	0.69	*CS*	
Undocumented students brought here as children who have good academic & clean criminal records should be encouraged to go to college.	2.06	0.90		*pe*
We should educate the children of people who produce our food.	2.11	0.79		*pe*
Immigrants bring new ideas and a willingness to work hard to the USA.	2.24	0.85		*pi*
Children should never have to work to help feed their families.	2.25	1.07		
It makes more sense to educate undocumented children now than pay the costs of having a large number of uneducated people here later.	2.25	0.91		*pe*
If a foreigner has education and skills we need for our economy, we should allow him/her to legally immigrate to the USA.	2.30	0.87		*pi*
Immigration is one of the things that made this country great.	2.31	1.02		*pi*
Welcome anyone who wants to live, work & play-by-the-rules in the USA.	2.33	0.96		*pi*
Undocumented workers are exploited & mistreated by employers here.	2.37	0.97		*tv*
Many pregnant women cross the border into the USA just to give birth to an 'anchor' baby – a baby who is an American citizen at birth.	2.41	0.86		*au*
Society is morally obligated to educate children of migrants/illegal aliens.	2.41	0.92		*pe*
Per capita, the USA welcomes more immigrants/refugees than any other.	2.49	0.83	*CS*	*tv*
The U.S. government was correct in changing immigration procedures for all immigrants after the terrorist attacks of 9/11/2001.	2.50	1.04		*au*
I'm willing to pay extra for food grown and harvested by legal workers.	2.54	1.01		
Require everyone who comes to the USA to learn English w/in 3 years.	2.56	1.05		*lx*
If a foreigner is willing to work hard at a job most Americans are unwilling to do, we should allow him/her to immigrate to the USA.	2.69	1.02		*em*
Farmers should provide comfortable & safe housing for farm workers.	2.69	1.10		*em*
Illegal aliens in the USA reduce the wages earned by real Americans.	2.72	1.01		*em*
We can't offer amnesty to illegals because others will follow behind them.	2.77	0.88		*au*
Crossing the border w/out documentation should be a deadly risk.	2.77	1.11	*ED*	*au*
If a foreigner is a refugee, we should allow him/her to immigrate to USA.	2.82	1.09		*em*
Real Americans lose jobs to illegal aliens.	2.83	1.12		*au*
USA is obligated to give sanctuary to the world's poor, huddled masses.	2.84	1.07		*pc*
People in the USA w/out documentation should be protected by our laws.	2.84	1.09		*tv*
The USA can't be safe without absolute & total control over its borders.	2.86	1.04		*pc*
The current situation – with millions of illegal aliens in the USA – is challenge unlike anything our nation has ever faced before.	2.88	1.02		*au*
If a foreigner is very rich, we should allow him/her to immigrate to USA.	2.89	1.06		*pi*
The government puts too many rules and regulations on farmers.	2.90	0.82		
Parents' status, not birth location, should determine a baby's citizenship.	2.94	1.11		*au*
When people are speaking a language I do not understand, I worry that they are talking about me.	2.95	1.21	*CT*	*lx*

TABLE Continued				
Illegal aliens cost us more than they contribute to our economy.	2.97	1.01		*au*
Because people producing food I eat are paid poorly, I have more money.	3.04	1.04		
If farmers do not provide acceptable housing for their farm workers, the farmers will be in trouble with government regulators.	3.07	1.10		*em*
I am uncomfortable with people speaking a language I don't understand.	3.07	1.21	*CT*	*lx*
If a teacher suspects that a student and/or their family is undocumented, they should call the federal immigration enforcement agency.	3.09	1.04		*em*
Everyone in America has an equal chance to succeed.	3.21	1.29	*CT*	*tv*
Without farm workers, we would develop machines to take their place.	3.22	1.06	*CT*	*bm*
All people in the USA should be required to speak English in public.	3.26	1.19	*CT*	*lx*
As a teacher, I'd be uncomfortable w/ students who didn't speak English.	3.29	1.09		*lx*
Farm workers shouldn't complain, they knew what they were getting into.	3.32	1.05		*bm*
Schools aren't legally obligated to teach migrants and illegal aliens.	3.41	1.10	*ED*	*pe*
Farm work is neither particularly hard nor dangerous.	3.51	1.31	*CT*	*em*
Our country needs to deport all the illegal aliens right away.	3.55	1.01		*au*
American immigration laws treat people of all countries fairly & equally.	3.59	0.99		*bm*
Farm workers should not complain – at least they have a job.	3.61	1.09	*ED*	*pc*
Migrants don't value education b/c they bring children to fields to work.	3.65	0.98	*ED*	*bm*
Moving from place-to-place all the time would be an adventure for a child.	3.89	0.97		*bm*
I do not trust people who are speaking a language other than English.	3.92	0.94		*lx*

AF= Attitude Factors, to be explained below in Objective 4: au= Anti-Undocumented; bm= Blame Migrants; em= Empathy for Migrants; lx= Linguistic Xenophobia; pe= Pro-Education; pc= Pro-Immigration Control; pi= Pro-Immigrant; tv= Traditional Values

The three strongest consensus prompts had a mean of less than 2.5, indicating that the consensus was to agree with these prompts. Two of them correlate with the "Traditional Values" attitude factor (explained in Objective 4) indicating that part of their appeal is that they are derived from the discourse of American exceptionalism and national pride (Hodgson, 2009).

The six outlying controversial prompts had means of 2.95 or higher, indicating that participants tended to be neutral to skeptical about them. One controversial prompt, regarding equality of opportunity, can also be considered part of the Rhetoric of American "Traditional Values." Half of the controversial prompts conveyed hostility toward languages other than English. The last two highly controversial prompts ("Farm work is neither particularly hard nor dangerous" and "Without farm workers, we would develop machines to take their place") demonstrated the range from knowledge to ignorance about farm work within our sample.

Four prompts with means for educators that differed by more than 0.3 were noted. Interesting, there were no prompts that educators agreed with at a substantially higher rate – teachers only disagreed more. These four prompts had means of 2.77 or higher, indicating that the sample was already neutral to skeptical about them. Paralleling the most controversial prompts, these four prompts convey a conservative perspective. Thus, with their higher level of disputation, the educators indicated a more liberal perspective regarding these issues.

Objective 3: Liberal-Conservative Political Orientation: The "Nurturing Liberal" factor

A composite factor was created by applying Lakoff's (2010) argument that the metaphor of 'government as parent' can provide useful insight into the thinking of liberals and conservatives in the U.S. Lakoff states that liberals consistently use language that supports a "nurturing and supportive" role for government, while conservatives invoke a "strict disciplinarian" approach. On the basis of this dichotomy, attitude prompts were semantically categorized. Participants' pro-nurturing responses were summed and their pro-disciplinarian responses subtracted to construct a composite "Nurturing Liberal" factor (range 45 to 194, $M = 94.2$, $SD = 19.2$) that rose in value with participants' agreement with a "supportive" role for government.

Evidence for the validity of the composite Nurturing Liberal factor is to be found in its strong correlations with both the participants' self-reported liberal political affiliation (.504) and with the White Conservative background factor (-.263). Other experience subgroups that correlated significantly with Nurturing Liberal were Non-Cosmopolitans (-.308) and Female Teachers (.249). All of these correlations are two-tailed Pearson and significant at the .01 level.

Correlations with the Nurturing Liberal factor allow us to identify the prompts that provoked the most extreme responses. They range from -.587 for the most conservative prompt "Our country needs to deport all the illegal aliens right away" to .457 for the most liberal prompt "It makes more sense to educate undocumented children now than pay the costs of having a large number of uneducated people here later." As seen during the current crisis regarding unaccompanied children along the Mexican border, issues regarding undocumented immigrants are very divisive, provoking clear correlations between participants' politics and their responses. The two other most liberal prompts also concerned this issue: "Undocumented students brought here as children who have good academic and clean criminal records should be encouraged to go to college" (.446) and "People in the USA without documentation should be protected by our laws" (.443).

The divisiveness of the issue of immigrants without papers is reinforced by the fact that three of the four most conservative prompts also regarded undocumented immigration, including "Illegal aliens cost us more than they contribute to our economy." (-.472). Other prompts that tended to result in polarized correlations regarded language and education – facts that will be reflected later in Objective 5 as the Pro-Education and Linguistic Xenophobia attitude response factors will be shown to have the most extreme correlations with the Nurturing Liberal factor.

Objective 4: Attitude Response Factors and their Politics

A Principle Component Factor Analysis was conducted upon the responses to the attitude prompts, excepting five prompts with problematic response patterns that did not correlate well with any other responses. It was shown that 39.5% of the total variance could be explained in terms of eight intuitively and semantically valid latent variables: Pro-Education; Pro-Immigrant; Empathy for Migrants and Poor; Pro-Immigration Control; Rhetoric of 'Blame the Migrants,' Anti-Undocumented; Rhetoric of 'Traditional Values,' and Linguistic Xenophobia. These emerged from an Equamax Rotation with Kaiser Normalization and Anderson-Rubin scoring. The factors range in value from approximately -5 to 3.5, with $M \approx 0$ and $SD \approx 1$. In order to

further explain the nature of these attitude response factors, they are listed in column AF in Table 3 alongside their most significantly correlating prompts.

As Table 4 shows, all eight attitude response factors correlated significantly with the Nurturing Liberal factor. Liberals were strongly Pro-Education and Pro-Immigrant in their responses. Meanwhile, conservatives displayed Linguistic Xenophobia and Anti-Undocumented sentiments, and accepted the rhetorics of Traditional Values and Blame the Migrants. These correlations parallel those from the students' self-reported political affiliations. The educators in our sample tended toward more liberal positions: opposing strong immigration controls, rejecting both the rhetorics of Traditional Values and Blame the Migrants, while supporting education.

Table 4: Significant Correlations: Attitude Response Factors v. Politics & Educator

Attitude Response Factors	Nurturing Liberal	Student Liberal Politics self-ID	Educators $^{\rho}$
Pro-Education	.383**	.258**	.150**
Pro-Immigrant	.365**	.185**	
Empathy Migrants & Poor	.194**		
Pro-Immigration Control	-.110*		-.169**
Rhetoric of Blame the Migrants	-.324**		-.341**
Anti-Undocumented	-.400**	-.204**	
Rhetoric of Traditional Values	-.410**	-.362**	-.143**
Linguistic Xenophobia	-.434**	-.230**	

**Note.* All Pearson, except $^{\rho}$ = Spearman; **=significant at 0.01 level, *=0.05 level; all are 2 tailed

Objective 5: Demographics and Experience vis-à-vis Response Factors

Table 5 identifies all significant correlations between the background and attitude factors developed in this manuscript.

Table 5: Significant Correlations: Background Experiences v. Attitude Factors – All Participants

Background Experience Subgroups: *Attitude Factors*	White Conservatives	Rural Aggies	Non-Cosmopolitans	Female Teachers
Pro-Education	-.186**		-.128*	.191**
Pro-Immigrant			-.124*	
Empathy Migrant/Poor	-.107*			
Pro-Immigration Control				-.126*
Rhetoric of Blame the Migrants	-.114*	-.209**		-.351**
Anti-Undocumented	-	-	-	-
Rhetoric of Traditional Values	.307**	.160**		-.154**
Linguistic Xenophobia	.109*		.346**	

**Note.* All Pearson; **=significant at 0.01 level, *=0.05 level; all are 2 tailed

The most conservative attitude factors (identified in Table 4) do not find uniform support from any of the background subgroups. Non-Cosmopolitans did not correlate with Traditional Values, but did express a high level of discomfort with diversity through their adherence to Linguistic

Xenophobia. Opposingly, White Conservatives agreed very strongly with invocations of Traditional Values, but only weakly with Linguistic Xenophobia. Intriguingly, although Rural Aggies also supported Traditional Values, they notably rejected the Rhetoric of Blame the Migrants. Even more strongly opposed to Blaming Migrants were Female Teachers. Anti-Undocumented attitudes did not correlate significantly with any subgroup, possibly due the current divisiveness of these issues. A closer look at specific demographic and experiential items in Table 6 allows some further insight into some of the underlying details.

Table 6: Significant Correlations: Specific Demographics / Experiences v. Attitude Factors

Backgrnd: *Attitude*	Male $^{\rho}$	Black $^{\rho}$	Latino $^{\rho}$	Fmly Inc̸m	Spoke w/Migr	Agric Exprc	Gens Farm	Travel >South	Travel >USA
Pro-Educ.			.17**			-.12*			
Pro-Imm.				-.13*					
Emp. Migr.			.13*						-.13*
ProImmCtrl					-.15*	-.13*	.13*		
Blame Migr.	.23**	.13*			-.18**	-.18**			
Anti-Undoc					-.15**				
TradValues		-.30**		.14*	.17**	.16**	-.12*		
LingXnoph			-.11*					-.17**	-.11*

**Note.* All Pearson, except $^{\rho}$ = Spearman; **=significant at 0.01 level, *=0.05 level; all are 2 tailed

Table 6 shows that some specific demographic groups held strong attitudes. Males were strongly associated with the Rhetoric of Blame the Migrant, while African Americans correlated mildly with the same. More significantly, Blacks overwhelmingly rejected Traditional Values rhetoric. Notably, Latinos held particularly strong Pro-Education attitudes, other than teachers themselves.

Surprisingly, increased Family Income was not a strong indicator of many attitudes, only correlating mildly with reduced Pro-Immigrant and increased Traditional Values sentiments. Experience working in farming and speaking with migrants has some significant correlations: reducing support for strict immigration control and Blame the Migrant rhetoric. This is despite the fact that both background experiences correlate significantly and positively with adherence to Traditional Values. Somewhat expectedly, travel beyond the South and outside the U.S. is a counterweight to Linguistic Xenophobia.

Conclusions, Recommendations and Questions for Further Research

If agriculture educators are to take up the challenge of cultivating open and honest dialogues about migrancy, immigration and farming among both their students and their colleagues, they need to be aware that they have multiple audiences to address within these groups. For example, a group of generally politically conservative students can hold very different attitudes about the issues at hand. White Conservatives can be distinguished from Non-Cosmopolitans on the basis of both their life experiences and their divergent responses to Traditional Values and Linguistic Xenophobia. Non-Cosmopolitans' personal fear of diversity and discomfort with non-English speakers suggests that positive personal interaction with immigrants could address some of their concerns. However, for White Conservatives, a more fact-based challenge to their Rhetoric of

Traditional Values might be in order. For both groups, hearing their Rural Aggie classmates' attitudes, rooted in both personal experience with migrants and technical knowledge of farming, would appear to have transformational potential.

Conversations and more formal training with other teachers, especially groups that are, like the teacher workforce in general, predominantly female can assume a higher level of support for migrants and immigrants. It is around the Rhetoric of Blame the Migrants that gender differences become most acute. Statements about migrants being at fault for their own circumstances are common among men, but even more uncommon among female teachers. This difference is a likely source of debate in mixed-gender groups.

Although this first analysis of the data has yielded significant findings, there are a number of questions that remain to be addressed through further data collection and analysis:

1) How does the generally conservative politics of rural communities interact with the liberalizing (regarding issues of migrancy and immigration) effects of interacting and working with migrants in agricultural settings?
2) Do specific demographic subgroups (male/female, rural/urban, race and ethnicity, income, etc.) within the larger background factor subgroups diverge from those groups in significant ways? What about individuals who bridge seemingly divergent subgroups? What of Female Teachers who come from strongly White Conservative or Non-Cosmopolitan backgrounds? Or African Americans with Rural Aggie experience?
3) How can the attitudes of students and teachers best be informed and challenged? What pedagogies, literature, and experiences are most effective regarding these issues? Which attitudes are most/least easily challenged and among which subpopulations?

Further data collection and analysis may allow us to form a clearer picture of how the various elements identified thus far in this study weigh upon and interact with each other. In the meantime, it is hoped that agriculture educators will accept the challenge of explaining our nation's dependence on migrants and immigrant labor and work to propagate and inform thoughtful conversations among both their colleagues and students.

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WESTERN REGION STUDENT TEACHERS' PERCEPTIONS OF RURAL AND URBAN AGRISCIENCE PROGRAMS

Research: Quantitative RPA: Teacher Education and School-Based Ag Education

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Western Region Student Teacher Perceptions of Rural and Urban Agriscience Programs

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Abstract

Agricultural Education is continually changing and its role in the urban school is becoming more important. Agriscience teachers must be willing to teach within urban programs. This study was performed in order to identify characteristics in recruiting agriscience teachers in urban programs. Data collection took place during the months of August and September 2010 using a researcher designed questionnaire. Seventy Western Region student teachers, completing their programs in the AAAE Western Region, completed the questionnaire. Findings of this study concluded participants' value location as an important factor when selecting their teaching position. The majority of participants experienced an agriscience program in a rural program and agreed they are receiving the correct preparation to teach in an urban program. Participants completing an agriscience program in rural and urban areas are willing to teach in either rural or urban programs. The majority desire to teach in the type of program they experienced in high school; therefore most of the participants want to teach in rural programs. Kirchhoff and Lawerenz's model of the pathway to retention in high-need settings indicates that the main influence in perspective teachers to teach in urban settings were choosing teaching as a career, choosing where to teach, and remain teaching in high-need settings (2011). The researchers suggested the importance of creating awareness and encouraging students to learn about urban agricultural programs. Research needs to be conducted on how to influence those teachers to accept jobs in urban areas.

Introduction-Theoretical Framework

There are currently 7,429 agriculture education programs that exist in all 50 states, Puerto Rico, and the Virgin Islands (National FFA Organization, 2010). According to the National FFA Organization (2010), within the 7,429 agricultural education programs, there are 506,199 FFA members. The National FFA Organization (2005) set a goal to have 10,000 programs by 2015. With an integrated model of classroom instruction, teaching, laboratory instruction, experiential learning, leadership opportunities and personal skill training, these programs will better serve the students of agricultural education programs (National FFA Organization, 2008). According to Warner (2006), the most promising area of expansion would be in urban school districts where schools are diverse in their offerings to accommodate the increasing student populations.

Agricultural education in the United States (US) is constantly changing (Kantrovich, 2007). As new teachers are educated and brought into the profession, they have to adapt as the education profession continues to change (Lynch, 1996). It is important to track the implemented changes within agricultural education programs throughout America (Kantrovich, 2007). In recent years, there has been a shortage of teachers nationally. As agricultural education programs increase in popularity in urban settings, the demand for teachers able and willing to teach in those urban settings also increases (Warner, 2006). This new demand raises questions

concerning the motivating factors leading teacher candidates to pursue teaching jobs in urban areas, particularly since a majority of teacher candidates are from more traditional program experiences. The shortage of agricultural education teachers is not a result of the shortfall of graduates but the low percentage of graduates that actually choose teaching as their career (Kantrovich, 2007). According to Brown (1995):

> Approximately half of those graduating with a bachelor's degree in agricultural education were electing not to enter the teaching profession. The problem was not created by insufficient numbers completing bachelor's degrees in agricultural education. The problem was created by insufficient recruitment of qualified individuals into the profession of teaching (p.9).

In order to increase the number of agricultural education programs, it is very important to increase the number of programs in urban areas (Warner & Washburn, 2007a). The United States Census Bureau (USCB) defines an urban area as an area encompassing 50,000 people or more. Urban areas can be inside or outside of metropolitan areas and geographic areas such as counties and places can contain urban areas, rural areas, or both (United States Census, 2010). Esters (2005) stated the concept of urban agricultural education programs has been around for more than 50 years. Urban agricultural education programs combine the traditional vocational program model with new approaches and broadened curricula (National Research Council, 1988). Esters (2007) stated there has been increasing interest among educators to establish urban agricultural education programs in major cities. Therefore, an adequate amount of agricultural education teachers must be willing to teach and maintain a position within those urban programs (Warner & Washburn, 2007a).

Teachers are likely to seek positions in or close to their desired environment, hometown, or somewhere very similar (Easter, Shultz, Neyhart, & Reck, 1999; Gilbert, 1995; Werner, 1993). Prospective teachers are often reluctant to teach students with different backgrounds than their own; therefore, many agricultural education teachers are unwilling to teach in an urban program (Zeichner, 1993). When teachers are searching for employment, they will tend to look for jobs close to where they grew up (Zimpher, 1988). Teachers believe if they go back to their hometown or nearby surrounding areas they will have a better understanding of students since they have comparable backgrounds (Werner, 1993). In addition, teachers from rural/suburban backgrounds feel they would be successful when teaching in environments in which they are comfortable. Teachers growing up in rural or suburban areas are often reluctant to accept a teaching position within an urban area (Gilbert, 1995).

Teachers are often attracted to urban schools because they feel they can make a difference with the satisfaction of making a contribution in helping students with academic growth (Gilbert, 1995). Warner and Washburn (2007b) found that teachers who are eager to accept and retain teaching positions in urban locations are desperately needed. The most influential factors on the teachers' career decisions were the desire to interact with people and the opportunity to teach students valuable life skills through different components of the program. The increase in urban agriculture programs offers a multitude of benefits, but without agriculture teachers willing to teach in urban schools, there will be no one to reap those benefits and the efforts to expand urban agricultural education will be futile (Warner and Washburn, 2007b).

Purpose and Objectives

The purpose of this study was to identify student teachers' perceptions of rural and urban agriscience programs, as well as to explore and describe the characteristics of agricultural education student teachers. This study evaluated students currently enrolled in their agricultural education student teaching experience. Perceptions of rural and urban agriscience programs were explored as well as the relationship between the types of agriscience program the student teacher experienced in high school compared to the type of program in which they desired to teach. These students attended a university in the Western Region.

The following objectives were developed based on the purpose of this study:

1. Describe the type of agriscience program the student teacher experienced in their high school career.
2. Describe factors that influence student teachers' career choice of teaching in urban and rural programs.
3. Describe student teachers' beliefs about urban programs.
4. Describe the relationship between the type of agriscience program the student experienced in high school and the type of program in which they desire to teach.

Theoretical Framework

This study utilized Kirchhoff and Lawrenz (2011) model of pathway to retention in high-need settings. The model of the pathway to retention in high-need settings (Kirchhoff & Lawrenz, 2011), "indicates the main influences on scholars' decisions regarding teaching and teaching in high-need settings" (p. 252). According to the model, relations exist between choosing teaching as a career, choosing where to teach, and remain teaching in high need settings. The model becomes extremely relevant in recruiting agriscience teachers to urban settings. Urban settings are currently the high-need area in terms of growth for FFA and agriscience programs.

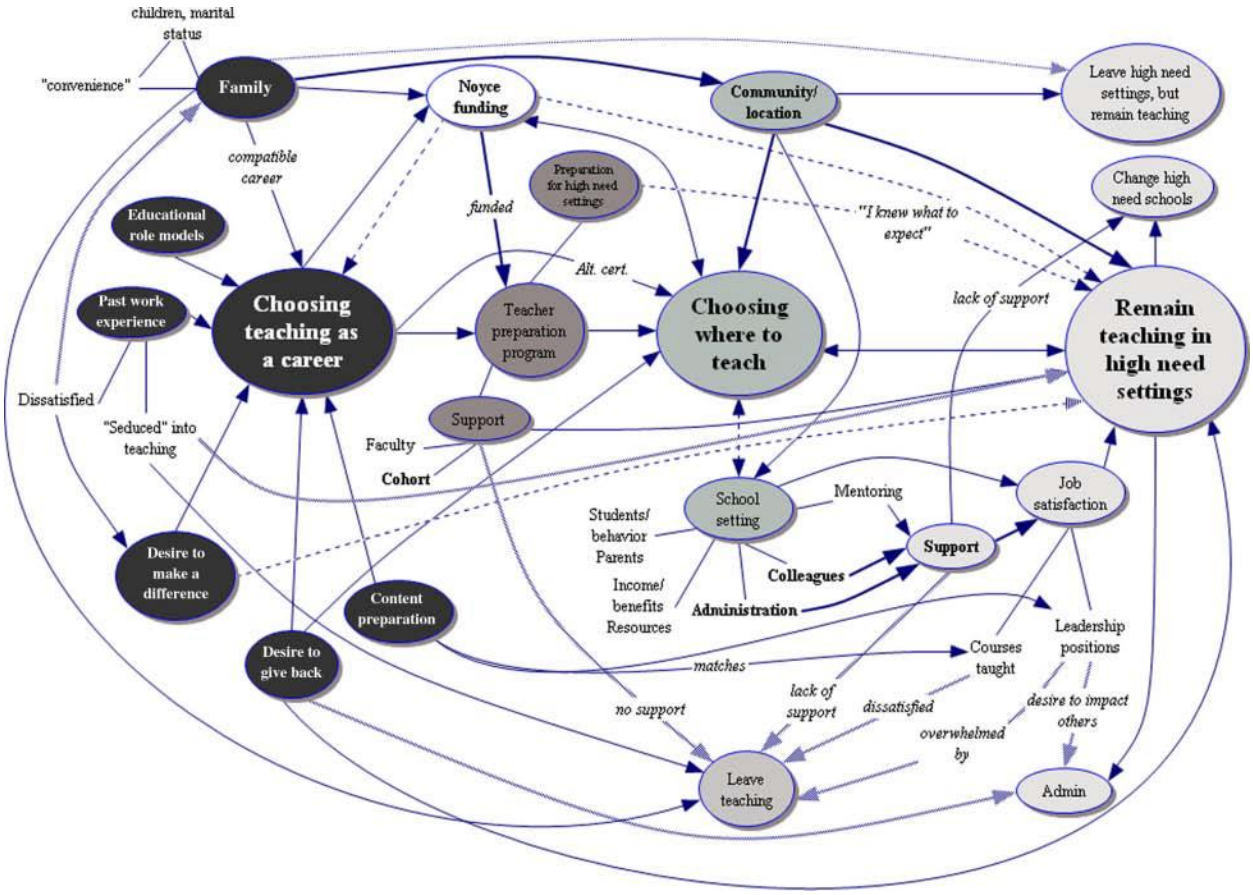

Figure 1: Model of the pathway to retention in high-need settings (Kirchhoff & Lawrenz, 2011)

The main category that influenced the decision about where to teach was the community and location. Almost all participants reported looking for teaching positions near their community or close to their family's community. "The school setting seemed to highly influence the scholars, in particular, the support of administration and colleagues" (Kirchhoff & Lawrenz, 2011, p. 253). The support from the administration and colleagues greatly affected job satisfaction and ultimately, the decision to remain in the school.

No trends were found between the type of program (alternative or traditional certification) and the participants' decision to teach. The two major topics related to the role of teacher education were support and preparation for high-need settings. Students found support in faculty and cohorts; cohorts had a significant impact on students remaining to teach in high-need settings (Kirchhoff & Lawrenz, 2011). Preparation for high-need settings was important, although not as relevant as support. Preparation levels varied greatly between the students, and specific details of preparation for high-need settings were more important than others. Several scholars reported the importance of the experience in high-need settings, especially for those who grew up with a different background. Pre-service teachers addressed the importance of learning how to deal with low-income students and their family situations (Kirchhoff & Lawrenz, 2011).

Lent et al. (2002) found when young adults make their career decision they mention their direct experiences relating to work shaped their choices. Kirchoff & Lawrenz's model of the pathway to retention in high-need settings shows a relationship between choosing teaching as a career, where to teach, and remain teaching in high-need settings (2011). In addition, Christopher-Sisk, Gravino, & Phillips (2001) found young adults will seek help from others to assist in their decision making process.

Warner and Washburn (2007b) found several specifics related to the teachers' decisions to teach agricultural education in urban schools. The desired location, decision to teach in a particular school, teachers' perceptions of urban schools, and participants' perceptions of agricultural education in rural schools were all part of the findings.

Grasping the concept and an understanding of agricultural education in urban programs is extremely important. According to Warner (2006) urban schools enroll students whose demographic characteristics are different than those of rural and suburban students. In several urban schools, minority groups (American Indian/Alaska Natives, Asians/Pacific Islanders, Hispanic, and African American) represent the majority of the population (Warner, 2006). According to the Urban Teacher Collaborative (2000), 50% of minority students in the United States are enrolled in urban schools. It is projected that urban schools educate almost half of the students who are not proficient in English (Urban Teacher Collaborative, 2000)

There is a need to identify characteristics of teachers who want to teach in urban programs in order to recruit agriscience teachers for those programs. With a decline in the number of rural areas, there is a high need for urban agriscience teachers to teach in developing urban agricultural education programs. In looking at Western Region agricultural education student teachers, perceptions of urban and rural agricultural programs can be described, as well as the desired teaching location.

Having a better understanding of why and how teachers make decisions based on certain characteristics of teaching in rural or urban agricultural education program can give professionals in teacher education a better grasp on how to recruit teachers to teach in urban programs. Using Kirchhoff and Lawrenz (2011) model of pathway to retention in high-need settings when recruiting teachers will help to retain those teachers in an urban setting.

Methods and Procedures

This study was designed using quantitative research methods to examine the relationship between variables. This study describes student teachers of the Western Region according to the type of program they participated in during high school and the factors of job selection criteria. Student teachers' perceptions of urban and rural programs were also explored.

The target population for this study included all students completing their agricultural education student teaching experience within American Association for Agricultural Education (AAAE) Western Region universities in the fall 2010 semester. All 29 AAAE Western Region universities were contacted via a telephone call or email. The professor overseeing the student teacher preparation program was contacted and asked for cooperation in administering the questionnaire to students in their institution.

Seven universities did not have student teachers for the fall 2010 semester, and therefore, were not included in this study. Of the universities within the population, ten universities agreed to participate and their students were included in the accepting sample. Within the sample from the ten universities, 71 student teachers ($N = 71$) completed the survey from Western Region universities. The surveys were completed before their teaching experience. The researcher believes the student teacher's experience will impact their perceptions. However, due to the timeline, the survey was completed before they went in the field.

One participant was removed due to not completing the instrument correctly. Therefore, the accepting sample included 70 Western Region student teachers ($N = 70$). Nine student teachers ($n = 9$) indicated they were not enrolled in agricultural courses in high school. Since these student teachers were not enrolled in agricultural courses, they were directed to skip the *types of programs* section and move on to the second section of the instrument.

The instrument was divided into five sections. The sections included the background of the type of program the participant experienced in high school, participant's beliefs about rural and urban programs, the importance of job selection criteria, how comfortable the participant is in teaching certain areas of content, and demographics. Validity was established by a panel of experts in the Agricultural Education and Communications Department at Texas Tech University. The panel measured the instrument for both face and content validity, making sure the instrument was measuring what it was intended to measure.

Reliability of the data collection instrument was established through a pilot test conducted on students at "state" university. Initial reliability estimates were low (estimates ranged from .13 to .78), particularly on the section measuring beliefs about rural and urban programs. The instrument was revised based on the reliability analysis and feedback from participants in the pilot. Several items were eliminated or reworded and the directions were edited to more clearly reflect the purpose of the items. A post hoc reliability analysis of the instrument yielded reliability estimates of .99 for the beliefs section, .89 for the job selection section, and .96 for the content area section.

Data was collected during the months of August and September of 2010. This study was conducted over the course of six weeks and reached 70 student teachers within nine AAAE Western Region universities. Each contact made after the initial correspondence was tailored for the convenience at each individual university due to student teacher program schedules. Universities participating in this study were given the instrument before the field experience. The individual overseeing the student teacher preparation program administered the survey.

Data was analyzed using Statistical Package for Social Sciences (SPSS) version 17.0 for Microsoft® Windows. Frequencies and percentages were used to describe the type of program the student teacher completed in high school and to describe the characteristics of teaching in urban and rural programs. Frequencies and percentages were used to describe Western Region student teachers' beliefs about urban programs.

Findings

Demographics

The variables of gender, age, ethnicity, and grade point average were evaluated by calculating frequencies, frequency percentage, and mode. The sample for this study consisted of 40 females (57.1%) and 30 male (42.9%) participants. Ages of the participating student teachers ranged from 20-51. The average age for the participants of this study was 22. Participant age was grouped categorically to provide a clearer picture of the distribution of ages throughout the sample. The majority were between the ages of 20-23 (n = 57, 81.4%). Other age categories represented were ages 24-28 (n = 12, 17.2%) and older than 29 (n = 1, 2.7%) with one individuals reporting their age as 51.

Four ethnic categories were identified among respondents. The majority of the sample (n = 65, 92.9%) was White (Non-Hispanic), followed by Hispanic (n = 3, 4.3%), African American (n = 1, 1.4%), and other ethnicities (n = 1, 1.4%). All student teachers self-reported their grade point average by category. The most frequently reported grade point average category reported was 3.0-3.5 (n = 31, 44.3%) followed by 3.6-4.0 (n = 25, 35.7%) and 2.6-3.0 (n = 12, 17.1%).

Objective one sought to describe the type of agriscience program the student teacher participated in during high school. Characteristics were assessed to determine if student teachers were enrolled in agriculture courses in high school and if they were active in the National FFA Organization. It is important to note that if the student was not enrolled in agriculture courses in high school, they were to skip to the second section of the survey. The majority of student teachers (n = 61, 87.1%) were enrolled in agriculture courses in high school and the remaining student teachers (n = 9, 12.9%) were not enrolled in agriculture courses in high school.

The population of the student teacher's hometown determined the type of community the student teacher experienced during their high school agriculture courses. The Bureau of the Census defines an urban area as an area with 50,000 people or more. The majority of student teachers completed high school in a rural community (n = 51, 72.9%). Student teachers completing high school in an urban community (n = 19, 27.1%) was significantly lower than those in rural communities.

The second objective sought to describe factors that influence student teachers' career choice of teaching in urban and rural programs. Western Region student teachers determined the importance of five factors in job selection by ranking five items from most important to least important (Table 1). The scales of measure ranged from one to five with one being the most important and five being the least important. Based on the five factors of important job selection criteria, participants value location (M = 2.01, SD = 1.27) as the most important factor in job selection. The second most important factor to consider in job selection was salary (M = 2.94, SD = 1.33), followed by type of program (M = 3.06, SD = 1.35) and content area (M = 3.10, SD = 1.35). The least important characteristic when selecting a teaching position was the length of the contract (M = 3.89, SD = 1.14).

Table 1
Average Ranking of Importance of Job Selection Factors(N = 70)

Characteristic	*M*	*SD*
Location	2.01	1.27
Salary	2.94	1.33
Content area	3.06	1.35
Type of program	3.10	1.35
Length of contract	3.89	1.14

Note: 1 = most important, 5 = least important.

The most important characteristic in job selection is location. Student teachers were given four characteristics in which they considered importance when choosing their desired teaching location. Most student teachers, (n = 51, 72.9 %) indicated that teaching in their home state was an important factor in job selection, followed by 42.9 % (n = 30) who desired to locate within a 60- mile radius of their hometown. They indicated teaching within their hometown was not important, with only 18.6% (n = 13) desiring to teach in their hometown and 28.6% (n = 20) indicated location wasn't an issue when selecting a teaching position, and they would locate anywhere.

The third objective sought to describe student teachers' beliefs about urban agricultural education programs. Participants of this study were asked to describe their level of agreement with nine statements based on a Likert-type scale. The six levels of agreement included 1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = slightly agree, 5 = agree, and 6 = strongly agree.

Participants of this study agreed there is a need for qualified agricultural education teachers in urban programs (n = 44, M = 5.41, SD = 1.10). In addition, student teachers agreed it is important to look at how to expand in urban areas (n = 34, M = 5.00, SD = .91). Participants indicated they agreed with the statement, "the trend for growth in agriculture education is going toward urban areas" (n = 28, M = 4.43, SD = 1.00). The statement, "different preparation is needed to teach in urban programs than rural programs" (n = 24, M = 4.37, SD = 1.13) gathered a slightly agree level of agreement from the teachers. Along with the importance of different preparation, student teachers indicated their slight agreement with the statement that, "student teaching experience will prepare them to teach in an urban program," (n = 30, M = 4.34, SD = 1.18). In addition, participants agreed that they have the skills to teach in an urban program (n = 35, M = 4.54, SD = 1.11).

In addition, participants indicated they slightly agreed with the statement of taking a job in an urban program (n = 25, M = 4.31, SD = 1.12). The statements, "individuals who graduate from an urban school are more prepared to teach in an urban agriscience program," (n = 23, M = 3.86, SD = 1.34), and "the type of high school program I attended does not affect my ability to teach in a rural or urban program," (n = 20, M = 3.80, SD = 1.50) received a slightly lower level of agreement. Almost half of the participants indicated they agree that there is a difference in teaching in rural and urban programs (n = 33, M = 2.16, SD = 1.21).

Objective four sought to determine the relationship between the type of program the student teacher experienced in high school compared to the type of program in which they desire to teach. A Pearson's chi-square test was utilized. Of the 70 AAAE Western Region student teachers, 61 student teachers were included in this objective since they experienced agriscience courses in high school. Eighty-four percent of student teachers attended high school in a rural community (n = 51). Of those student teachers, 24 (n = 24) desire to teach in a rural program, two (n = 2) desire to teach in an urban program (n = 2), 20 (n = 20) desire to teach in either a rural or urban program, and one (n = 1) does not plan to teach. Of the student teachers who participated in a high school program in an urban area (n = 10), desire to teach in a rural program (n = 2), desire to teach in an urban program (n = 5), and desire to teach in either a rural or urban program (n = 7).

A contingency table analysis was conducted to evaluate whether the type program the student teacher experienced in high school compared to the type of program they desire to teach (Table 2). The two variables were the type of program the student teacher attended in high school (rural or urban) and the type of program the student teacher desires to teach (rural, urban, does not matter, do not plan to teach). Follow-up comparisons were conducted between student teachers experiencing a program in rural or urban areas. The Holm's sequential Bonferroni method was used to control for Type I error at the .05 level across the comparisons. The only difference that was significant was between those experiencing a program in rural and urban programs desiring to teach in urban and rural programs. The comparison was not conducted on those not desiring to teach or those who don't prefer to teach in a specific program due to matching the expected outcomes.

Table 2
Relationship between program experienced and program desired to teach (*N = 70)*

Comparison	Pearson chi-square	*p* value	Cramer's V
Rural versus urban	13.41	.00	.64

Conclusions-Implications-Recommendations

Objective one sought to describe the type of agriscience program the student teacher experienced in high school. The majority of Western Region student teachers completed agricultural courses at the high school level. Western Region student teachers have a better understanding about agricultural education programs in rural areas as opposed to urban agricultural education programs. The findings of this study support the findings of Werner (1993), who found teachers believe if they go back to their hometown or nearby surrounding areas, they will have a better understanding of students with comparable backgrounds.

Objective two sought to describe characteristics of teaching in urban and rural programs. Western Region teachers ranked five factors in selecting their first teaching position. They indicated location was the most important factor when choosing a teaching position followed by salary. Student teachers know the locations they find desirable when selecting their teaching position. The findings of this study are not in agreement with the findings in studies conducted by Gilbert (1995) and Werner (1993) indicating teachers are likely to seek positions within their hometown; however, it supports the findings that they seek employment in similar environments. Student teachers prioritize their job selection based on the location of the program being in their

home state or within a 60-mile radius versus their hometown. Warner (2006) found teachers' decisions to teach in an urban school were based on their perceptions of urban schools and perception of agricultural education in rural schools. Findings from this study did not support those of Warner's (2006) study due to the fact that Western Region student teachers base their job selection criteria on location more than any other factor.

Objective three sought to describe student teachers' beliefs towards urban programs. Participants of this study agreed there is a need for qualified agricultural education teachers in urban areas, and that it is important to look at how to expand in urban areas. The majority of participants grew up in a rural program. Participants believe they are knowledgeable about urban agricultural education programs even though they did not attend one in high school; therefore, it is not imperative that we educate student teachers about the importance of urban agriscience programs. Warner and Washburn (2007a) indicated that in order to increase the number of agricultural education programs, it is very important to increase the number of programs in urban areas. This finding supports the findings from Warner and Washburn's study as participants agreed there is a need for qualified teachers in urban programs.

Objective four sought to determine the relationship between the type of program the student experienced in high school and the type of program in which they desire to teach. The majority of participants who were enrolled in an agriscience program in rural and urban programs are willing to teach in either rural or urban programs. Of those student teachers who indicated their desire to teach in a specific program, the majority desire to teach in the program type that they attended in high school.

Participants who participated in an agriscience program in a rural area are willing to teach in a rural or urban program. The findings of this study do not support the findings of a study conducted by Zeichner (1993) that concluded prospective teachers are often reluctant to teach students with different backgrounds than their own; therefore, many are unwilling to teach in an urban program. The results of this study show participants growing up in a rural area are willing to take a position in an urban agriscience program. The findings of this study support the finding from Warner and Washburn (2007a) indicating agriscience teachers must be willing to accept a position within urban agriscience programs.

The majority of student teachers who participated in agriscience programs in rural areas are willing to accept a teaching position within a rural or urban area. Student teachers need to be educated on urban programs early in their agricultural education study. It is recommended that universities provide students with opportunities to take classes about urban agricultural education programs. In addition, attending professional development events could increase knowledge and broaden their perceptions towards urban programs. Exposing student teachers to more than one type of program could increase awareness of the different types of program within agricultural education. This could create awareness for the types of agricultural education programs.

Future research should be conducted in the form of a nationwide study to see if these findings are regional or if they can be applied to agriculture education teacher preparation programs across the country. In addition, further research should be conducted on student

teachers' perceptions of urban and rural agricultural education programs. This would allow a greater understanding of the way teachers are making their decisions.

With student teacher's indicating they are willing to consider a job in an urban program; further research needs to be conducted on how to influence those teachers to accept jobs in urban areas. With this study identifying certain characteristics upon which teachers make their job selection choice, research is needed to identify ways to implement those characteristics in encouraging student teachers to accept teaching positions within urban agriscience programs.

It is not enough to simply recruit students into high-need settings, once agriscience teachers are there it is essential to keep them there. Reflecting Kirchhoff and Lawrenz (2011) model of pathway to retention in high-need settings, those items need to be considered in recruiting students to urban settings so that a higher number of teachers are retained. Using their model and keeping those items in mind will help urban programs to grow long-term.

In addition, additional research is needed on perceptions of students who would not consider teaching in an urban school. Research identifying educational material to educate students not interested in urban programs about the importance and benefits of teaching in an urban program should be conducted.

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How FFA Camp Affects Youths' Attitudes for Learning about Leadership

Research Priority Area: Agricultural Literacy

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How FFA Camp Affects Youths' Attitudes for Learning about Leadership

Abstract

In the 1970s, the number of FFA camps expanded quickly across the country with the goal of increasing leadership capacities of FFA members. Although FFA camps were designed, originally, as a fun medium to increase leadership skills, current data suggests that camps also can improve students' content knowledge. The two major domains that impact the outcome of learning are cognitive and affective. Although recent research has been conducted regarding cognitive achievement at FFA camps, scholars have called for additional research on youth development related to the affective domain. The purpose of this descriptive-correlational study was to measure the relationship between the cognitive and affective learning domains of FFA members who attended Oklahoma FFA Alumni Leadership Camp. Although camp participants have an overall positive attitude about camp, there is no relationship between what they learned during small group sessions and their attitude toward the overall camp experience. As a result of this study, those responsible for planning the Oklahoma FFA Alumni Leadership Camp are advised to discontinue the use of academically structured learning material during small group sessions and consider incorporating activities that will help campers improve their learning of leadership concepts in the context of outdoor activities and recreation.

Introduction and Background

In excess of 10 million children attend a youth camp each year (American Camp Association [ACA], n.d.). Typically, youth camps are held outdoors during the summer months with a curriculum delivered by trained leaders (Henderson, Bialeschki, & James, 2007). When people think of attending a camp, they usually envision a fun, enjoyable environment that offers multiple opportunities for making new friends and participating in engaging activities (Henderson et al., 2007). Camps can, however, serve as serious learning environments where life skills, such as problem solving, decision making, and respecting others, are learned (Thurber, Scanlin, Scheuler, & Henderson, 2007, p. 251). One such camp offered each year with the intent to improve learning is the Oklahoma FFA Alumni Leadership Camp (Brown & Terry, 2013).

In the 1970s, FFA camps expanded quickly in individual states across the country with the goal of increasing leadership capacities of FFA members (Hoover, Scholl, Dunigan, & Mamontova, 2007). In addition to learning valuable leadership skills, FFA camps allow students to meet new friends, participate in recreational activities, and make lifelong memories (Connors, Falk, &

Epps, 2010). Although leadership development has been the primary focus of FFA summer camp activities, numerous states also incorporated experiences related to conservation and environmental stewardship (Connors et al., 2010).

Although FFA camps were designed, originally, as a fun medium to increase leadership skills, current data suggests that camps also embed an element of seriousness and can improve students' content knowledge. In a recent study, Brown et al. (2013) found that youth doubled their knowledge associated with a program focusing on communications offered during the three and one-half-day experience. Data were generated from a pretest to a posttest criterion-referenced examination based on objectives of the camp. However, when assessing content knowledge six months later, via a deferred posttest, long-term retention of this knowledge was found to be negligible, causing the researchers to question the impact of FFA camp on the outcome of learning.

The two major domains that impact the outcome of learning are cognitive and affective (Kraiger, Ford, & Salas, 1993). Learning is multidimensional and may be impacted by a person's cognitive and affective capacities (Gagne, 1984). The cognitive domain of learning encompasses activities impacting a person's mental ability to process, store, and retrieve information and includes the mental strategies necessary for learning new content (Kraiger et al., 1993). The affective domain, however, focuses more on the person's feelings and attitudes and is associated with how people relate to or connect with the material (Kraiger et al., 1993). Affective learning impacts a person's feelings, moods, and emotions with the material. Although both the cognitive and affective domains affect learning, "The affective domain can be characterized as being indirectly linked to learning outcomes" (Boyle et al., 2007, p. 301).

One factor that could relate to students' attitudes while attending camp is the instructor in charge of delivering content (Brown & Terry, Jr., 2013). In fact, Bialeschki, Henderson, and James (2007) stated, "camp is not inherently good without purposeful and directed efforts by camp professionals" (p. 770). Among other things, camp instructors can help students improve their "teamwork, social skills, and initiative" (Ferrari & McNeely, 2007, Discussion para.)

Students who are connected to and engaged with the content through the affective domain have improved levels of learning due to their increased understanding, as a result of their emotional connection and motivation (Biggs, 1999). However, unfortunately, students' emotional connection to what they learn at camp has not always been perceived in the most positive light. In a study of 4-H camp attendees, respondents shared that their friends considered camp to be "stupid, childish, for nerds, corny, lame, cheesy, and boring" (Garst & Johnson, 2005, Results para.). Therefore, Larson (2000) called for additional research on youth development related to the affective domain. One means of measuring the affective domain is by assessing students' attitudes (Breckler & Wiggins, 1989a; Phillips, 1992).

Theoretical Lens

Attitudes can impact a person's behavior and performance (Cochran, et al., 2010; Gagne, 1984; Hortwitz, Hortwitz, & Cope, 1986; Onwuegbuzie, Bailey, & Daley, 2000; Shih & Gamoon, 2001). Kelman (2007) identified four factors of attitudes:

> 1) Attitudes inextricably combine the affective and cognitive dimensions of our relationships to social objects; 2) attitudes are shared within a group, organization, or society and constitute properties of both the individual and the collectivity within which these attitudes are shared; 3) attitudes emerge and constantly evolve and change in a context of action and interaction; 4) an attitude represents a range of potential commitment to the object . . . at times extending from approach to avoidance, from support to opposition – rather than a single point on a bipolar scale. (p. 288)

This study was guided by the attitude theory (Breckler & Wiggins, 1989a). Historically, attitude theory has emphasized the affective domain of learning (Breckler & Wiggins, 1989a). This study was concerned with campers' attitude *extremities throughout* the camp experience. Attitude extremities are defined as "the degree of favorableness or favorableness of an individual's evaluation of a given object" (Krosnick & Abelson, 1992, p. 179). Semantic differential scales assist researchers in learning how subjects respond to a stem statement regarding the extremities of their attitude (Breckler, & Wiggins, 1989b).

"Many theoretical considerations of attitude have, of course, argued that stronger attitudes have stronger links to behavior than weaker attitudes" (Raden, 1985, p. 313). However, attitude and its impact on learning and behavior is a complicated phenomenon. Ajzen and Fishbein (1977) posited that attitude "is one of many factors determining behavior" (p. 888). Similar to other studies, variability has existed in how researchers have used attitudes as predictors in learning (Funk, Haugtvedt, & Howard, 2000).

Wingenbach and Kahler (1997) concluded, "The construct of youth leadership and life skills development is a complex arrangement of experiences, backgrounds, and attitudes, when measured by the perceptions of secondary agricultural education students" (p. 25). As complex as it is, a combination of factors, such as camp goals, small group leaders, perceived emotional safety, and activities help make outcome achievements a possibility (Bialeschki et al., 2007). Because of these numerous factors, the majority of research conducted on camps has been anecdotal in nature (Henderson et al., 2007). Therefore, a need existed to determine the relationship of participants' overall attitude toward attending a statewide leadership camp, and how it affected their cognitive outcome related to learning the curriculum delivered at the camp.

Purpose and Objectives

The purpose of this study was to measure the relationship between the cognitive and affective learning domains of FFA members who attended Oklahoma FFA Alumni Leadership Camp. Also of interest were interactions between attitude and selected personal characteristics. The study aligns with the American Association for Agricultural Education's National Research Agenda Priority Four, which focuses on investigating meaningful, engaged, learning in multiple environments (Doerfert, 2011).

The following objectives were formulated to accomplish the purpose of this study:

1. Assess campers' attitudes regarding the overall camp experience.

2. Determine the relationship between campers' leadership knowledge acquired, as a result of the curriculum taught, and their attitudes toward the overall camp experience.
3. Determine the relationship between campers' leadership knowledge retained, as a result of the curriculum taught, and their attitudes toward the overall camp experience.
4. Describe the relationship between campers' selected personal characteristics (sex, race, age, grade level, socioeconomic status, years of camp attendance, chapter FFA officer status, and grade point average) and attitudes regarding the overall camp experience.

Methods

This descriptive-correlational study investigated FFA members (campers) who attended Oklahoma FFA Alumni Leadership Camp in the summer of 2011. Campers were members of the National FFA Organization whose school classification ranged from eighth to twelfth grade. With more than 1,500 Oklahoma FFA members attending the four three and one-half-day camp sessions, we determined a random sample was appropriate. Simple random sampling techniques allowed us to be less intrusive on the camp experience while also collecting data that could be generalized to the entire population of camp participants (Creswell, 2008). According to Krejcie and Morgan (1970), a sample of at least 310 subjects was needed to generalize to the population (N = 1,543). We chose to randomly sample 435 campers from the population to ensure the final sample size would be sufficient. Randomizer.org, a web-based randomization site, was used to generate a list of 435 campers from the population. Forty campers were not granted parental permission to participate, so the sample was condensed to 395. In the end, we achieved an 87% response rate as 344 campers assented to join the study. This high response rate negated any procedures necessary to control for non-response error (Lindner, Murphy, & Briers, 2001).

Data Collection Instruments

Three instruments were utilized to collect quantitative data and meet the objectives of the study: (a) the Camp Communications Content Examination (CCCE), (b) the Alumni Camp Attitude Assessment (ACAS), and (c) a nine-item questionnaire designed to collect campers' personal characteristics.

In 2011, the camp leadership curriculum focused on interpersonal and intrapersonal communications. We collaborated with Oklahoma FFA staff and camp planners to construct the CCCE, a criterion-referenced exam. The CCCE was designed to measure the level of campers' cognitive achievement concomitant with the communications curriculum taught at camp. The CCCE consisted of 17 multiple-choice questions, which were cross-walked to the curriculum taught during small group sessions that met throughout the camp experience.

A panel of experts was engaged to assess face and content validity of the CCCE instrument. The panel consisted of three university faculty members in agricultural education, two curriculum designers, and three high school students. Specifically, we relied on the university faculty to critically evaluate the test construction while we asked the curriculum specialists to examine each question for content validity. Finally, we elected to include high school students in the panel to determine if the instructions and writing were age appropriate.

Criterion-referenced exams are used for the purpose of determining the amount of information learned or retained (Kane, 1986). Therefore, conventional reliability indices testing for internal consistency are not necessarily appropriate (Kane, 1986). Instead, we employed the Kuder-Richardson (*KR20*) formula, as it is the most suitable test for reliability of criterion-referenced items (Cronbach, 1970). The CCCE generated a reliability coefficient of .52 (*KR20*). Kane (1986) explained that criterion-referenced instruments should produce reliability coefficients above .50 to be deemed reliable. Thus, the CCCE was deemed reliable and valid.

We created the Alumni Camp Attitude Assessment (ACAS), a semantic differential (Osgood, Suci, & Tannenbaum, 1965), to measure the attitudes of campers concerning the camp experience. According to Isaac and Michael (1995), "the semantic differential is a method for measuring the meaning of concepts" (p. 144). Osgood et al. (1965) used factor analysis of 76 pairs of dichotomous adjectives to identify three factors that account for a variety of the semantic differential loadings. The three factors are evaluation, potency, and activeness (Osgood et al., 1965). Isaac and Michael (1995) suggested that pairs of adjectives should be selected from the list of those factor-analyzed and developed by Osgood et al. (1965) and placed on opposing ends of a seven-point summative scale. The instrument should include five to nine pairs of adjectives from each of the three factors (Osgood et al., 1965). Following this advice, we chose five adjective pairs for each of the three factors, and varied the arrangement of each adjective pair so that the potent, evaluative, and activeness ends of the scales were situated on both the left and right positions of the seven-point scale to avoid response pattern development. Table 1 displays the 15 pairs of polar adjectives selected to include in the sematic differential that were developed for the purpose of this study. An attitude score between 1.00 and 3.99 is considered a negative attitude, a score between 4.00 and 4.99 is a considered a neutral attitude, and a score between 5.00 and 7.00 is considered a positive attitude (Isaac & Michael, 1995).

Table 1

List of Pairs of Polar Adjectives Utilized for the Development of Alumni Camp Attitude Assessment (ACAS) Semantic Differential

Evaluation	Potency	Activeness
Good – Bad	Hard – Soft	Active – Passive
Happy – Sad	Strong – Weak	Fast – Slow
Sociable – Unsociable	Large – Small	Difficult – Easy
Friendly – Unfriendly	Heavy – Light	Emotional – Unemotional
Kind – Cruel	Deep – Shallow	Excitable – Calm

The same panel of experts reviewed the ACAS for face and content validity. Although all adjective sets were chosen from the list of factor-analyzed adjective pairs developed by Osgood et al. (1965) and were considered standardized, we elected to perform a post-hock reliability analysis of the ACAS. The ACAS generated a reliability coefficient of .70 (Cronbach's Alpha). As a result, we deemed the ACAS to be both valid and reliable.

Campers' personal characteristics were collected using a nine-item questionnaire. The instrument included six multiple-option questions, two fill-in-the-blank questions, and an open-ended item. Our panel of experts reviewed the questionnaire for face and content validity.

Research Procedures

During camp registration activities, participating campers were asked to complete the personal characteristics questionnaire. Before leaving camp, campers were asked to complete the ACAS and the CCCE to measure the amount of knowledge acquired. The results of the content examination were utilized to determine the level of cognitive gain associated with the communications curriculum taught by former FFA members during the 12 one-hour small group sessions that met throughout the camp experience. Per the educational literature regarding delayed posttests (Berti & Andriolo, 2001), each camper was instructed to complete the CCCE again six months later. The results of the delayed content examination were employed to determine campers' cognitive retention (Fleming & Alexander, 2001; Hall & Edmonson, 1992).

We followed Dillman's Tailored Design (2000) to ensure a high response rate associated with the data collection for the delayed content examination. We decided that communicating with the teachers of each research participant, rather than contacting each camper individually, would achieve the highest possible response rate. The resulting procedures were followed to achieve an optimal response rate (Dillman, 2000):

1. *Respondent-friendly questionnaire* – A panel of experts reviewed the CCCE to ensure that the questions were clear and comprehendible. The panel also reviewed the instrument's design.
2. *Four separate mailings to each subject by first class mail, with an additional contact* – Each teacher received a letter of pre-notice three days prior to the questionnaire being mailed. The questionnaire was mailed with an explanatory letter included. A thank you/reminder postcard was mailed approximately one week after the questionnaire was received. Replacement questionnaires were mailed to teachers who no longer had the instrument in their possession.
3. *Return envelopes with first class stamps* – A return envelope with a prepaid first class postage stamp affixed accompanied each questionnaire.
4. *Personalized correspondence* – All correspondence was printed on high quality stationary, including names of instructors and original signatures from the researcher.
5. *Prepaid incentive* – Each questionnaire packet included an ink pen branded with the Oklahoma State University logo and the department name. Teachers were encouraged to keep the pen as a token of appreciation for their effort in the data collection process.

As expected, research mortality (Kirk, 1995) occurred. In all, 243 campers completed the delayed content examination, producing a 70.65% response rate. To control for nonresponse error, we compared 20 non-responders to our sample and determined that there was no significant difference between delayed content exam scores of responders and non-responders $t(261) = -.56$, $p = .58$. The collection of non-responder data was accomplished by contacting Agricultural Education teachers of those campers' who did not respond originally.

Analysis of Data

Creswell (2008) explained correlational research is necessitated when "you seek to relate two or more variables to see if they influence each other" (p. 356). Therefore, Pearson's correlation

coefficient *r* was used to test if relationships existed between camper content examination scores and continuous variables, which are appropriate when determining relationships between test scores and continuous data (Field, 2009). Additional statistical procedures were necessitated to answer the fourth research question. ANOVA was used to determine relationships between campers' attitude scores and nominal variables with multiple categories (Kirk, 1995). Finally, a *t*-test was calculated to determine relationships between campers' attitude scores and nominal variables with only two categories (Kirk, 1995). Appropriate statistical analyses were employed to ensure all assumptions were met (Field, 2009).

"Effect size in the correlational context is referred to as the strength of association between two variables" (Chen & Popovich, 2002, p. 42). Cohen's (1988) conventional reference of effect size magnitude related to correlations (small = 0.1, moderate = 0.3, large = 0.5) are "relative, not only to each other, but to the area of behavioral science or even more particularly to the specific content and research method being employed in any given investigation" (p. 25). Cohen's *d* was calculated for all *t*-test outputs. Kirk (1995) explained, "Cohen refers to a *d* value of 0.2 as a small effect size" (p. 64). He added that " a medium effect size is one for which $d = 0.5$, and a large effect size is one for which $d = 0.8$" (Kirk, 1995, p. 64). Partial eta squared (η_p^2) was reported for all ANOVA outputs (Kirk, 1995).

Findings

Findings Associated with Objective One

The first objective was to assess attitudes of participants regarding the overall camp experience. Campers' attitudes were measured by three constructs: evaluation of camp, potency of camp, and activeness of camp. Figure 1 is a diagrammatic illustration of mean attitude scores associated with each construct.

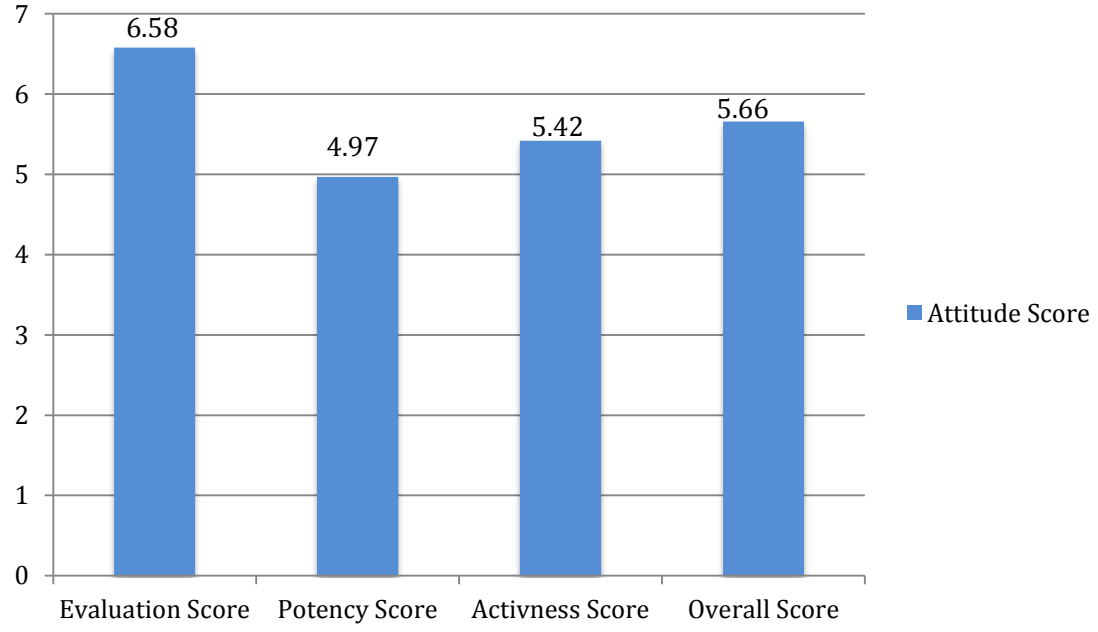

Figure 1. Mean camper attitude scores by construct.

The possible score range was 1.00 – 7.00. A score falling between 1.00 and 3.99 indicated a negative attitude. A mean score between 4.00 and 4.99 was considered a neutral attitude. And, finally, a mean score between 5.00 and 7.00 indicated a positive attitude (Osgood et al., 1965). As displayed in Table 2, campers' overall attitude toward camp was positive (M = 5.66; SD = 0.45). When comparing the three attitude constructs, they were most positive regarding their evaluative attitude of camp (M = 6.58; SD = 0.53), followed by their attitude related to the activeness of camp (M = 5.42; SD = 0.62). Camper attitude related to the potency of camp (M = 4.97; SD = 0.65) was neutral (see Table 2).

Table 2

Mean Camper Attitude Scores (n = 344)

Type of Attitude	n	M[a]	SD
Attitude Related to Evaluation of Camp	344	6.58	0.53
Attitude Related to Potency of Camp	344	4.97	0.65
Attitude Related to Activeness of Camp	344	5.42	0.62
Overall Attitude of Camp	344	5.66	0.45

[a]Scale: 1.00 – 3.99 = negative attitude; 4.00 – 4.99 = neutral attitude; 5.00 – 7.00 = positive attitude.

Findings Associated with Objective Two

Table 3 displays that no statistically significant relationship existed $r(342) = .01$, $p = .83$ between camper evaluation of camp attitude scores and content examination scores. Data do, however, reveal that camper content examination scores were statistically significantly correlated to camper attitude scores when measuring the potency of camp $r(342) = .11$, $p = .04$. According to Cohen (1988) an $r = .11$ is a small effect size. No statistically significant relationship existed between camper attitude scores associated with activeness of camp and camper content examination scores $r(342) = .07$, $p = .20$. Further, no statistically significant relationship existed between campers' total attitude toward camp score and their content examination score $r(342) = .09$, $p = .10$ (see Table 3).

Table 3

Correlation Between Camper Attitude Scores and Content Examination Scores (n = 344)

	Camper Exam Score
Evaluation of Camp	.01
Potency of Camp	.11*
Activeness of Camp	.07
Overall Attitude Toward Camp	.09

*$p < .05$.

Findings Associated with Objective Three

Table 4 shows that no statistically significant relationship existed between campers' evaluative attitude of camp score and delayed content examination score $r(241) = -.06$, $p = .33$. Data also reveal that campers' delayed content examination scores are not statistically significantly correlated to campers' potency attitude of camp scores $r(241) = .06$, $p = .32$. No statistically significant relationship existed between campers' activeness attitude of camp scores and campers' delayed content examination scores $r(241) = .09$, $p = .16$. Further, no statistically significant relationship existed $r(241) = .05$, $p = .45$ between campers' overall attitude toward camp score and delayed content examination score (see Table 4).

Table 4

Correlation Between Camper Attitude Scores and Delayed Content Examination Scores (n = 243)

	Camper Exam Score
Evaluation of Camp	-.06
Potency of Camp	.06
Activeness of Camp	.09
Overall Attitude Toward Camp	.05

Findings Associated with Objective Four

The fourth objective was to determine the relationship between selected personal characteristics (i.e., sex, race, age, grade level, socioeconomic status, years of camp attendance, chapter FFA officer status, and grade point average) and attitudes of participants regarding the overall camp experience. Socioeconomic status (SES) was determined by asking campers if they received free or reduced lunches at school, a practice accepted widely in academic literature to distinguish levels of SES (Caldas & Bankson, 1997; Molnar et al., 1999; Nye, Konstantopoulos, & Hedges, 2004). We chose to report only statistically significant findings. No statistically significant relationships were detected between attitude scores and sex, race, SES, chapter officer status, or GPA.

Table 5 displays data showing that no statistically significant relationship was found between campers' age and evaluative attitude score $r(344) = .03$, $p = .59$. A statistically significant correlation was found between campers' age and potency attitude $r(344) = .15$, $p = .00$. According to Cohen (1988) an $r = .15$ is a small effect size. No statistically significant relationship was detected between campers' age and activeness attitude mean score $r(344) = .09$, $p = .11$. However, a statistically significant relationship did exist between campers' age and their overall mean attitude score (see Table 5), which also resulted in a small effect (Cohen, 1988).

Table 5

Correlation Between Camper Age and Attitude Scores (n = 344)

	Camper Age
Evaluation of Camp	.03
Potency of Camp	.15*
Activeness of Camp	.09
Overall Attitude Toward Camp	.12*

There were no statistically significant differences between campers' evaluative attitude scores $F(4, 343) = 1.00$, $p = .41$ or activeness attitude scores $F(4, 343) = 2.18$, $p = .07$ by grade level (see Table 6). As displayed in Table 6, there was a statistically significant difference between campers' potency attitude scores when compared by grade level. The analysis resulted in an effect size of $\eta_p^2 = .04$, indicating that 4% of the variance can be attributed to camper grade level. A post hoc pairwise analysis revealed that ninth grade campers had a statistically significantly lower potency attitude score than did twelfth grade campers (see Table 6).

Table 6

Comparative Analysis of Camper Potency Attitude Scores by Grade Level (n = 344)

	SS	*df*	*MS*	*F*	*p*
Between-Groups	5.86	4	1.47	3.62	.01
Within-Groups	137.20	339	.41		
Total	143.06	343			

*$p < .05$.

Table 7 shows there was a statistically significant difference between camper's overall attitude scores by grade level. The analysis produced an effect size of $\eta_p^2 = .04$, indicating 4% of the variance can be attributed to grade level. A post hoc pairwise analysis revealed that ninth grade campers have a statistically significantly lower overall attitude score than twelfth grade campers (see Table 7).

Table 7

Comparative Analysis of Camper Overall Attitude Scores by Grade Level (n = 344)

	SS	*df*	*MS*	*F*	*p*
Between-Groups	2.68	4	.67	3.41	.01
Within-Groups	66.66	339	.20		
Total	69.33	343			

*$p < .05$.

When comparing mean attitude scores by years of camp attendance, we found no statistically significant differences between campers' mean evaluative attitude scores when compared by years of camp attendance $F(4, 343) = 1.70$, $p = .15$. We found, however, differences in potency attitude scores when compared by years of camp attendance. This analysis resulted in an effect size of $\eta_p^2 = .07$, signifying 7% of the variance in potency attitude scores can be attributed to

years of camp attendance (see Table 8). A post hoc, pairwise analysis revealed campers' who were participating in camp for the third or fourth time had a statistically significantly higher potency attitude score than campers who were attending for the first time (see Table 8).

Table 8

Comparative Analysis of Camper Potency Attitude Scores by Years of Camp Attendance (n = 344)

	SS	*df*	*MS*	*F*	*p*
Between-Groups	9.85	4	2.46	6.27	.00
Within-Groups	133.21	339	.39		
Total	143.06	343			

*$p < .05$.

Table 9 shows data indicating a statistically significant difference between campers' activeness attitude scores when compared by years of camp attendance. The analysis produced an effect size of $\eta_p^2 = .09$, meaning 9% of the variance in activeness attitude scores can be attributed to years of camp attendance. A pairwise analysis indicated campers who were attending camp the third time produced a statistically significantly higher activeness attitude score than those campers who are attending for the first or second time (see Table 9).

Table 9

Comparative Analysis of Camper Activeness Attitude Scores by Years of Camp Attendance (n = 344)

	SS	*df*	*MS*	*F*	*p*
Between-Groups	12.34	4	3.09	8.80	.00
Within-Groups	118.94	339	.35		
Total	131.28	343			

*$p < .05$.

Finally, we found statistically significant differences in campers' overall attitude scores when compared by years of camp attendance (see Table 10). Analysis resulted in an effect size of $\eta_p^2 = .09$, indicating that 9% of the variance in overall attitude scores can be attributed to years of camp experience. A post hoc, pairwise analysis revealed campers attending camp the third time had a significantly higher overall attitude score than those campers who were attending for the first or second time (see Table 10).

Table 10

Comparative Analysis of Camper Overall Attitude Scores by Years of Camp Attendance (n = 344)

	SS	*df*	*MS*	*F*	*p*
Between-Groups	6.34	4	1.58	8.53	.00
Within-Groups	62.97	339	.19		
Total	69.33	343			

*$p < .05$.

Conclusions, Implications, and Recommendations

Overall, campers have a positive attitude toward the overall camp experience. Two of the three construct scores were greater than 5.00, indicating campers have a positive attitude regarding their evaluation of the camp and the activeness of the camp experience. The lowest attitude score was associated with the potency of camp. The mean of 4.97 indicates that campers' attitudes were indifferent regarding the potency of the camp experience. Do campers not recognize the need to learn the planned academic curriculum? Campers' indifferent potency attitude suggests they were not challenged by the learning goals at camp.

Findings of this study lead to the conclusion there is no statistically significant relationship between attitude and learning of the curriculum taught. Further, there is no relationship between campers' attitudes at camp and what they remember from the camp experience six months later. This conclusion refutes previous research indicating the presence of a relationship between the affective and cognitive learning domains (Boyle et al., 2007; Cochran, et al., 2010; Hortwitz et al., 1986; Onwuegbuzie et al., 2000) and supports the notion that attitude is one of many factors impacting a person's behavior (Ajzen & Fishbein, 1977). Therefore, what is the purpose of FFA Leadership Camp? The implication is that FFA Leadership Camp exists as a fun event that students enjoy. However, perhaps it is not the venue for significant learning of content.

Campers attending for the third year have more positive attitudes about camp than those who are attending for the first or second time. Do students with less camp experience exhibit lower attitude scores due to anxiety or even fear? Do previous experiences with camp – building on familiarity – lead to better attitudes? According to attitude theory (Breckler & Wiggins, 1989a), attitudes are shared in a group and are properties of both the individual and the group. We recommend camp planners consider informally organizing events that allow campers to group by years of camp experience and engage in activities appropriate for their comfort level. For example, more experienced students could engage in a high ropes course while first year students learn the foundations of trust by completing a low ropes course. We predict such practices would increase the attitude scores of both experienced and non-experienced campers.

What are the implications of these results for FFA camp planners? Conclusions of this study and previous research noting negligible knowledge retention from this camp (Brown & Terry, 2013) question the value of using a significant component of an FFA summer camp to teach academic leadership content. FFA summer camp, where the more formal structure of school is exchanged for an outdoor, short-term, physically active environment, may not be conducive for such a

component. Further, the emphasis and expectations of students may be more focused on meeting new people, socializing, and having fun than learning a curriculum. Finally, qualitative phenomenological research focused on discovering the essence of the lived experiences of FFA summer campers is warranted.

Further research is warranted to determine if our results are tenable over time; however, if they are, we recommend that camp planners discontinue the use of academically structured learning material during small group sessions. This recommendation is supported by the traditional concentration of FFA summer camps that taught leadership concepts in the context of outdoor activities focused on the environment, conservation, and recreation (Connors et al., 2010).

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Professional Development Needs of Tennessee School-Based Agricultural Education Teachers

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Research Priority Area: Teacher Education and School-Based Ag. Education

Abstract

School-based agricultural education (SBAE) teachers feel the skills and knowledge they bring into the classroom may be inadequate for providing their students with the tools needed to face the changing world. The purpose of this study was to explore the professional development needs of Tennessee school-based agricultural education teachers. In addition, this study sought to determine if differences existed in the professional development needs of Tennessee school-based agricultural education teachers based on selected demographic variables. The sample for this descriptive study was 127 SBAE teachers in Tennessee. The researchers modified an existing survey instrument and used descriptive statistics to describe the demographic data and professional development delivery preferences. To describe the professional development data, mean weighted discrepancy scores were used. The top five rated professional development items were (a) utilizing the Common Core in agricultural instruction, (b) teaching critical thinking skills, (c) managing stress, (d) balancing work and personal life, and (e) teaching problem solving skills. We recommend professional development be developed and offered related to the Common Core Standards, critical thinking, and problem solving. In regard to managing stress and balancing work and personal life, numerous factors such as extended contracts, implementing the total program (FFA, SAE, and instruction), new educational initiatives, and deficiencies in content or pedagogical knowledge may be contributing to these needs. Future research should investigate this matter in Tennessee and determine the most appropriate means for reducing work and personal life conflicts and stress. These recommendations should positively impact student success, since understanding teachers' needs are linked to student achievement.

Introduction/Literature Review

Student achievement has been the focus and unit of measure for school system success for years (Shoulders & Myers, 2014). In the late 1980s and throughout the 1990s, major educational reforms arose in the United States (Phipps, Osborne, Dyer, & Ball, 2008). Rigorous schedules of

standardized testing were on the rise during this time in order to stimulate student performance, chart achievement gains at the district and state levels, and promote core academic learning (Phipps, et al., 2008). Urbanization, global agricultural production capacity, biotechnology and digital equipment began to change the landscape of agriculture (National Research Council, 1988). Vocational agriculture education programs began to adapt and change their programs because curricula had to complement major goals for learning in the core subjects of math, science, reading, and writing as well as the new challenges in agriculture (Phipps, et al., 2008; National Research Council, 1988). In 1988, the National Research Council established the Committee on Agriculture Education in Secondary Education and released *Understanding Agriculture: New Directions for Education*. The report stated agriculture education must be more than vocational agriculture and revisions needed to be made to agriculture education at large. In response, schools began to integrate concepts from core subjects into the agriculture classroom (Phipps, et al., 2008). Agricultural literacy was also deemed necessary in order to educate all students about the food and fiber system (National Research Council, 1988). Thus, agriscience programs began in schools across the nation (Phipps, et al., 2008).

The educational reform initiatives of the 1990s emphasized testing, school and program evaluation and accountability, and increased standards for student achievement (Phipps, et al., 2008). Due to these initiatives, school-based agricultural education (SBAE) teachers have faced many challenges in their programs. Restrictions on number of field trips, FFA events, and so forth have been limited due to school administrators wanting to keep absences from core subjects to a minimum, but still demanding students be career ready (Phipps, et al., 2008). Additionally, agriculture continues to evolve and now includes forestry, nutrition, environmental sciences and life sciences (National Research Council, 2009). There is also a greater focus on the integration of global agricultural markets, how agriculture impacts the environment, consumer influence, growing demand for local and organic foods, rising concerns with obesity, and how the demographics of the agricultural workforce has changed (National Research Council, 2009). With these changes, many SBAE teachers feel the skills and knowledge they bring into the classroom may be inadequate for providing students with the tools needed to face the changing world (Sorensen, Tarpley, & Warnick, 2010). These feelings may indicate the need for professional development in order to help SBAE teachers face new educational and agricultural challenges.

To that end, Estepp, Thoron, Roberts, and Dyer (2014) posited that in order to maintain professional competence, all teachers must continuously learn throughout their careers. Similarly, Sorenson, Tarpley, and Warnick (2010) indicated SBAE teachers require some form of regular professional development to help cope with the rising demands of their profession. Professional development opportunities are designed and implemented to increase teacher learning, which can result in furthering student achievement (Shoulders & Myers, 2014). According to Supovitz and Turner (2000), professional development is considered the most effective outlet for implementing changes in teacher behavior and practices. Similarly, Shoulders and Meyers (2014) purported professional development to be the ultimate keystone for initiating teacher change, and teachers' personal perceptions and behaviors can be improved through professional development. Furthermore, Shoulders and Meyers concluded when professional development activities included the following core features: (a) focus on content, (b) coherence, (c) sufficient duration and (d) collective participation, teachers benefited more

from these activities than solely from active learning. Additionally, they recommended these core features be taken into consideration when designing and implementing future professional development.

Research specifically on professional development needs for SBAE teachers suggest needs vary based on years of experience and by state (Duncan, Ricketts, Peake, & Uesseler, 2006; Garton & Chung, 1996; Joergen 2002; Veeman, 1984). New agriculture teachers often experience greater difficulty with classroom management, motivating students, finding quality teaching materials, managing student behavior and discipline, and understanding and implementing school and community polices (Joerger, 2002; Veeman, 1984). Garton and Chung (1996) found there is a great need for helping new agricultural educators in numerous areas such as motivating their students, conducting local FFA chapter activities, and teaching using experiments. Furthermore, new agriculture teachers have a greater need for learning how to complete reports for their school administration, preparing quality FFA degree and proficiency applications, incorporating agriscience into their curricula, effectively utilizing alumni, advisory committees and youth organizations, developing SAE opportunities for their students, and effectively using public relations (Garton & Chung, 1996; Joerger, 2002; Layfield & Dobbins, 2002). Additionally, Garton and Chung found new agricultural educators need less information surrounding content knowledge and skills in agricultural construction, relation of agriculture to the environment, general knowledge about plants, and parent teacher conferences.

In regard to professional development needs by state, Layfield and Dobbins (2002) found SBAE teachers in South Carolina needed professional development in using computers, completing FFA degrees and proficiency applications, effectively using multimedia in the classroom, and better record keeping skills. Furthermore, South Carolina's experienced teachers vocalized a need in better overall integration of technology in the classroom and organizing and developing activities for youth and adult education (Layfield & Dobbins, 2002). In 2006, Georgia agricultural education teachers indicted professional development was needed to effectively integrate current advances in agricultural technology into the classroom and curriculum, develop SAE opportunities for students, and prepare better proficiency and degree application (Duncan, Ricketts, Peake, & Uesseler, 2006). Furthermore, while significant research lacks in the areas of professional development needs based on gender and grade level, Estepp et al. found female agricultural teachers in Florida had a need for professional development related to integrating math and science into the curricula as well as balancing work and personal life.

Purpose and Objectives

The purpose of this study was to explore the professional development needs of Tennessee SBAE teachers. No prior research was found on professional development needs of this population. In addition, this study sought to determine if differences existed in the professional development needs of Tennessee SBAE teachers based on selected demographic variables. Specifically, three research questions guided this study.

1. What are the professional development needs of Tennessee SBAE?
2. What differences exist, if any, in the professional development needs of SBAE teachers based on years of teaching experience, undergraduate major, gender, length of employment contract, and geographic region?

3. What are the professional development delivery preferences of Tennessee SBAE teachers?

Methods/Procedures

This descriptive study was conceptualized as a slice in time (Oliver & Hinkle, 1982) and was approved by the University of Tennessee's Institutional Review Board. The target population was SBAE teachers ($N = 330$) in Tennessee. Contact information for the teachers was provided by the Tennessee FFA Foundation. Data were collected during the spring 2013 semester using the Qualtrics online survey platform. Dillman, Smyth, and Christian's (2009) web survey implementation procedures guided the multiple contacts made. Dillman et al. stated little research exists on the optimal combination of contacts and suggested additional contacts are not needed when responses per contact stalls. Thus, six emails were sent to the entire target population by the researchers: (a) prenotice, (b) email with a link to the survey, (c) three reminder emails with a link to the survey, and a (d) final email with a link to the survey announcing the end of the study. One hundred eight teachers completed the survey and 12 declined to participate. In addition to these contacts, Tennessee's agriculture, food and natural resources consultant and two teacher educators sent email contacts encouraging the agricultural education teachers to complete the survey. Following this data collection period, the researchers also presented the opportunity to participate in this study to the SBAE teachers during the FFA summer camp and the summer professional development conference, which yielded 19 additional responses. Therefore, data were collected from 127 SBAE teachers or 38.5% of the target population.

To address potential nonresponse bias, the researchers compared early to late respondents on all items and compared respondents to the target population for the only known variables of gender and geographical region. These analyses were done to examine the external validity of the responses to the target population (Ary, Jacobs, Sorensen, & Walker, 2014). To that end, Lindner, Murphy, and Briers (2001) suggest defining early and late respondents based on the contacts made, and stated the minimum number of responses that should be categorized as late is 30 to ensure statistical meaning. Based on Lindner et al., the researchers classified the last 34 responses or the last three contacts as late respondents. Chi-square tests were utilized for nominal data and MANOVA was used for interval data. No differences were found between early and late respondents. The sample was also representative of the target population in regard to gender but was not representative in regard to geographical region. As a result, data were weighted according to Biemer and Christ (2008) to create a sample that was representative of the target population in regard to geographical region. After data were weighted based on geographical region, data were compared to the target population again and was found to be representative based on gender and geographical region.

The survey used in this study was a modified version of Estepp, Thoron, Roberts, and Dyer's (2014) professional development survey. The researchers reviewed Estepp et al.'s survey and removed items not pertinent to Tennessee, reworded items to reflect Tennessee's program of study, and added items specific to SBAE in Tennessee. Face and content validity were verified by an expert panel consisting of three agricultural education faculty, three SBAE teachers, and Tennessee's agriculture, food and natural resources consultant. Based on the recommendations

of the expert panel, two items were added and three items were revised for clarity. The final survey consisted of 85 items. Seventy-five items asked the teachers to provide their perceived levels of knowledge and relevance on competencies related to SBAE in Tennessee. Knowledge and relevance items were measured using a 5-point rating scale (1 = *low knowledge* or *relevance* and 5 = *high knowledge* or *relevance*). Post-hoc reliability was assessed for the aforementioned items using Cronhach's alpha (α = .97). The remaining 10 items consisted of nine demographic questions and one professional development delivery question.

Data were analyzed using IBM SPSS 20. Descriptive statistics (i.e., frequencies, percentages, and means) were used to describe the demographic data and professional development delivery preferences. To describe the professional development data, mean weighted discrepancy scores (MWDS; Borich, 1980) were used. Furthermore, the years of teaching experience data were grouped based on Steffy and Wolfe's (2001) life-cycle model for career teachers.

Results/Findings

The top five rated professional development items were (a) *utilizing the Common Core in agricultural instruction* (MWDS = 4.20), (b) *teaching critical thinking skills* (MWDS = 3.92), (c) *managing stress* (MWDS = 3.76), (d) *balancing work and personal life* (MWDS = 3.64), and (e) *teaching problem solving skills* (MWDS = 3.56). The professional development items MWDS ranged from -1.11 to 4.20. A complete list of professional development items and MWDS are found in Table 1.

Table 1
Mean Weighted Discrepancy Scores for Professional Development Items

	Knowledge		Relevance		
Item	*M*	*SD*	*M*	*SD*	*MWDS*
Utilizing the Common Core in agricultural instruction	2.82	1.20	3.87	1.12	4.20
Teaching critical thinking skills	3.70	0.89	4.53	0.65	3.92
Managing stress	3.49	1.01	4.37	0.86	3.76
Balancing work and personal life	3.29	1.10	4.38	0.82	3.64
Teaching problem solving skills	3.77	0.92	4.52	0.68	3.56
Managing time	3.67	0.91	4.43	0.77	3.25
Motivating students	3.84	0.90	4.60	0.63	3.23
Recruiting students	3.73	0.94	4.38	0.92	2.79
Teaching decision making skills	3.85	0.83	4.50	0.70	2.77
Integrating reading strategies into agricultural instruction	3.64	0.98	4.28	0.79	2.72
Managing the classroom	4.04	0.83	4.60	0.58	2.71
Modifying instruction for Special Needs Students	3.68	0.92	4.27	0.75	2.53
Managing facilities	3.76	0.83	4.35	0.80	2.52
Completing award applications (i.e. proficiencies, star awards, chapter awards)	3.24	1.01	3.87	1.07	2.45
Integrating science into agricultural instruction	3.95	0.99	4.50	0.66	2.39
Integrating math into agricultural instruction	3.82	0.85	4.34	0.74	2.07

Integrating content from academic End of Course Exams or TCAP concepts into agricultural instruction	3.11	0.94	3.66	1.13	2.02
Fundraising	3.65	0.91	4.18	0.94	2.02
Offering/implementing the Tennessee SAE course	2.52	1.13	3.17	1.31	2.00
Designing curricula	3.58	0.95	4.07	0.95	1.96
Preparing for Career Development Events	3.66	0.91	4.15	0.97	1.95
Teacher evaluation system (i.e. TEAM, TAP, etc.)	3.26	0.95	3.75	1.22	1.95
Teaching in laboratory settings (ex. Land lab, greenhouse, garden, ag mechanics lab, etc.)	4.01	0.97	4.49	0.80	1.90
Repairing and reconditioning agricultural tools and equipment	3.13	1.21	3.65	1.30	1.90
Teaching using technology	3.88	0.85	4.37	0.79	1.89
Developing public relations	3.59	0.96	4.06	1.03	1.89
Teaching leadership	3.94	0.83	4.45	0.75	1.86
Supervising non-traditional SAEs	3.33	1.11	3.75	1.19	1.77
Preparing reports for administrators	3.66	0.89	4.10	1.00	1.76
Developing SAE opportunities for students	3.63	0.99	4.10	1.01	1.72
Evaluating student performance	3.85	0.79	4.26	0.73	1.66
Understanding learning styles	3.72	0.80	4.16	0.78	1.65
Developing lesson plans	3.85	0.89	4.23	.087	1.56
Completing a Program of Activities	3.55	1.13	3.98	0.99	1.55
Utilizing a local advisory committee	3.72	1.01	4.08	0.97	1.47
Determining content to be taught in specific courses	3.69	0.91	4.05	0.94	1.45
Recruiting alumni	3.08	1.04	3.51	1.27	1.44
Recruiting volunteers	3.33	1.00	3.71	1.12	1.41
Designing programs for non-traditional students	3.20	1.00	3.57	1.10	1.40
Teaching Record-Keeping Skills	3.36	0.98	3.72	1.13	1.30
Developing relationships with other local agricultural organizations and agencies	3.90	0.88	4.22	0.86	1.27
Collaborating with teachers in other subjects	3.66	0.93	4.00	0.97	1.24
Locating and selecting reference materials	3.74	0.85	4.05	0.79	1.23
Evaluating the local agricultural education program	3.72	0.88	4.00	1.02	1.12
Collaborating with other agriculture teachers	3.96	0.89	4.22	0.85	1.07
Counseling students interested in post-secondary education	3.92	0.68	4.18	0.88	1.04
Selecting course offerings to fit the needs of the community	3.75	0.92	4.00	1.15	0.99
Teaching Agriscience	3.59	1.13	3.76	1.36	0.69
Teaching Veterinary Science	2.81	1.11	3.03	1.46	0.68
Teaching Agricultural Mechanics and Maintenance	3.07	1.40	3.29	1.58	0.68
Teaching Agricultural Power and Equipment	2.91	1.39	3.13	1.59	0.64
Teaching Plant Biotechnology	2.46	1.21	2.68	1.47	0.57
Teaching Agricultural Engineering	2.77	1.36	2.95	1.58	0.53
Supervising traditional SAEs	3.75	1.00	3.86	1.09	0.41

Teaching Aquaculture/Hydroponics	2.50	1.22	2.64	1.48	0.38
Teaching Financial Management	3.06	1.05	3.19	1.24	0.37
Teaching Floral Design	2.37	1.31	2.44	1.51	0.19
Managing volunteers	3.44	0.91	3.48	1.12	0.17
Teaching Greenhouse Management	3.65	1.11	3.66	1.53	0.08
Teaching Small Animal Care	3.09	1.21	3.11	1.53	0.07
Teaching Forestry Management	2.88	1.15	2.89	1.50	0.03
Teaching Equine Science	2.81	1.19	2.76	1.51	-0.11
Teaching Animal Biotechnology	2.53	1.06	2.45	1.28	-0.15
Teaching Leadership Communications	3.42	1.13	3.38	1.41	-0.17
Teaching Wildlife Management and Recreation	3.17	1.12	3.03	1.45	-0.34
Teaching Agricultural Sales and Marketing	2.65	1.07	2.48	1.32	-0.40
Teaching Landscaping and Turf Management	3.47	1.18	3.32	1.51	-0.54
Teaching Agricultural Economics	2.60	1.11	2.35	1.28	-0.59
Teaching Advance Principles of Agricultural Sciences	3.23	1.21	3.01	1.50	-0.64
Teaching Agricultural Business/Finance	2.70	1.14	2.38	1.34	-0.74
Teaching Plant and Soil Science	3.48	1.15	3.24	1.49	-0.75
Teaching Principles of Agricultural Sciences	3.73	1.13	3.49	1.55	-0.85
Teaching Principles of Horticultural Sciences	3.37	1.18	3.06	1.54	-0.94
Teaching Exploring Agricultural Science	3.29	1.24	2.90	1.51	-1.07
Teaching Livestock Management	3.37	1.16	3.00	1.45	-1.11

Note. Items are ranked highest to lowest priority.

Similarities and differences were present in professional development needs among SBAE teachers in Tennessee based on years of teaching experience, and no one items was found in every group. *Utilizing the Common Core in agricultural instruction* was rated top five for all groups except 0-5 years of experience, and *balancing work and personal life* and *teaching critical thinking skills* were rated top five for all groups except greater than 20 years of experience. Additionally, *managing stress* was rated top five for all groups except 11-20 years of experience, and *motivating students* was top five for the 11-20 and greater than 20 years of experience groups. A complete list of top five professional development items based on years of teaching experience is found in Table 2.

Table 2
Top Five Mean Weighted Discrepancy Scores Based on Years of Teaching Experience

Years of Teaching Experience	Item	*MWDS*
0-5	Teaching problem solving skills	6.12
	Teaching critical thinking skills	5.80
	Managing stress	5.43
	Balancing work and personal life	5.21
	Managing the classroom	4.98

6-10	Managing stress	5.75
	Utilizing the Common Core in agricultural instruction	5.70
	Teaching critical thinking skills	4.77
	Teaching problem solving skills	4.59
	Balancing work and personal life	4.48
11-20	Utilizing the Common Core in agricultural instruction	4.69
	Teaching critical thinking skills	4.00
	Balancing work and personal life	3.72
	Motivating students	3.43
	Managing time	3.31
>20	Managing stress	2.14
	Motivating students	1.91
	Utilizing the Common Core in agricultural instruction	1.83
	Fundraising	1.71
	Managing facilities	1.54

Similarities were mostly present in professional development needs of SBAE based on their undergraduate major. The one item not present in teachers who majored in agriculture education was *teaching problem solving skills*. Whereas those who majored in a specific agricultural content area did not have *motivating students* as a professional development factor. Both groups possessed (a) *utilizing the Common Core in agricultural instruction*, (b) *teaching critical thinking skills*, (c) *balancing work and personal life,* and *managing stress* in their top five. A complete list of the top professional development needs of SBAE teachers based on their undergraduate degree is found in Table 3.

Table 3
Top Five Mean Weighted Discrepancy Scores Based on Undergraduate Degree

Major	Item	*MWDS*
Agricultural Education	Utilizing the Common Core in agricultural instruction	4.02
	Teaching critical thinking skills	3.73
	Balancing work and personal life	3.61
	Managing stress	3.48
	Motivating students	3.44
Specific Agricultural Content Area	Teaching critical thinking skills	4.23
	Managing stress	4.09
	Utilizing the Common Core in agricultural instruction	4.04
	Teaching problem solving skills	3.96
	Balancing work and personal life	3.38

Similarities and differences were present in professional development needs of male and female SBAE teachers. Three items were rated top five in both groups (a) *utilizing the Common Core in agricultural instruction*, (b) *teaching critical thinking skills*, and (c) *balancing work and personal life*. Males identified (a) *managing stress* and (b) *managing time* as two top rated professional development needs that were different than females. Whereas females identified (a) *teaching problem solving skills* and (b) *modifying instruction for special needs students* as

professional development needs different than males. A complete list of professional development needs of male and female SBAE teachers is found in Table 4.

Table 4
Top Five Mean Weighted Discrepancy Scores Based on Gender

Gender	Item	*MWDS*
Male	Utilizing the Common Core in agricultural instruction	3.81
	Managing stress	3.65
	Teaching critical thinking skills	3.34
	Balancing work and personal life	3.24
	Managing time	3.20
Female	Teaching critical thinking skills	5.27
	Utilizing the Common Core in agricultural instruction	5.25
	Teaching problem solving skills	4.96
	Balancing work and personal life	4.64
	Modifying instruction for special needs students	4.17

Mostly differences, but some similarities were present in professional development needs of SBAE teachers based on their length of contract. Two items were rated top five in all three groups (a) *teaching problem solving skills*, and (b) *teaching critical thinking skills*. Teachers with a 10 month or 11 month employment contract report needing more assistance with items that directly relate back to the classroom such as (a) *integrating science into agricultural instruction*, (b) *teaching in laboratory settings*, (c) *motivating students*, and (d) *integrating reading strategies into agricultural instruction*. SBAE teachers with 12 month contracts desired more assistance with items related to their personal lives such as (a) *managing stress*, (b) *balancing work and personal life*, and (c) *managing time*. A complete list of professional development needs of SBAE teachers based on their length of contract is found in Table 5.

Table 5
Mean Weighted Discrepancy Scores for Length of Employment

Length of Employment Contract	Item	*MWDS*
10 months	Teaching problem solving skills	5.39
	Utilizing the Common Core in agricultural instruction	5.25
	Teaching critical thinking skills	4.50
	Integrating science into agricultural instruction	4.04
	Teaching in laboratory settings (ex. land lab, greenhouse, garden, ag mechanics lab, etc.)	3.78
11 months	Teaching critical thinking skills	4.16
	Motivating students	3.59
	Teaching problem solving skills	3.32
	Teaching decision making skills	3.08
	Integrating reading strategies into agricultural instruction	2.90
12 months	Managing stress	4.32
	Utilizing the Common Core in agricultural instruction	4.31

	Balancing work and personal life	4.13
	Teaching critical thinking skills	3.67
	Managing time	3.58

Similarities and differences were present in professional development needs of SBAE teachers located in the eastern, middle, and western regions of Tennessee. Only one item was consistent across all three regions; *utilizing the Common Core in agriculture instruction*. In the Eastern and Western region, three of the same items were ranked top five: (a) *utilizing the Common Core in agricultural instruction*, (b) *managing stress*, and (c) *managing time*. In the Eastern and Middle regions, only one item was rated top five in both groups: *teaching critical thinking skills*. A complete list of top five professional development items based on region is found in Table 6.

Table 6
Top Five Mean Weighted Discrepancy Scores Based on FFA Region

FFA Region	Item	*MWDS*
East	Utilizing the Common Core in agricultural instruction	4.18
	Managing stress	3.73
	Managing time	3.52
	Teaching critical thinking skills	3.50
	Balancing work and personal life	3.45
Middle	Teaching critical thinking skills	4.13
	Utilizing the Common Core in agricultural instruction	3.74
	Teaching problem solving skills	3.64
	Recruiting students	3.38
	Motivating students	3.17
West	Balancing work and personal life	5.33
	Utilizing the Common Core in agricultural instruction	5.09
	Managing stress	4.90
	Managing time	4.20
	Managing Facilities	4.10

Lastly, in regard to professional development delivery preferences (Table 7), SBAE teachers preferred professional development at the Tennessee summer teachers' conference or as a summer workshop. Few teachers preferred webinars for professional development. One teacher indicated they would prefer professional development to be during the school day and commented that other subjects have professional development during these hours. Lastly, one other teacher indicated they would like professional development to occur on location at their school. A complete list of professional development delivery preferences of SBAE teachers is found in Table 7.

Table 7
Professional Development Delivery Preferences

Delivery Preference	*f*
Summer conference	99
Summer workshop	83
Webinar	18

Other	2

Conclusions, Implications, and Recommendations

SBAE teachers in Tennessee are in need of various types of professional development. Overall, SBAE teachers identified their top professional development needs as (a) *utilizing Common Core in agricultural instruction*, (b) *teaching critical thinking skills* (c) *managing stress*, (d) *balancing work and personal life* and (e) *teaching problem solving skills*. Tennessee is a race to the top state, and the pressure to incorporate the Common Core Standards may explain why utilizing the Common Core was the number one professional development need. In addition, being a race to the top state may partially explain the need for professional development in teaching critical thinking and problem solving skills. Authors of the Common Core Standards claim the standards promote higher-order thinking skills (Common Core State Standards Initiative, 2014). Furthermore, the applied nature of agriculture may also partially explain the need for professional development in teaching critical thinking and problem solving. We recommend professional development be developed and offered related to the Common Core Standards, critical thinking, and problem solving. In regard to managing stress and balancing work and personal life, numerous factors such as extended contracts, implementing the total program (FFA, SAE, and instruction), new educational initiatives, and deficiencies in content or pedagogical knowledge may be contributing to this need. Future research should investigate this matter in Tennessee and determine the most appropriate means for reducing stress and work and personal life conflicts. These recommendations should positively impact student success, since understanding teachers' needs are linked to student achievement (Shoulders & Meyers, 2014).

Commonalities and differences were found based on years of teaching experience. Teachers with 0-5 years of teaching experience needed professional development in the area of managing the classroom. This need was not found in the top five of teachers with more than five years of experience. Unique to teachers with greater than 20 years of experience was the need for professional development in fundraising and managing facilities. The most common area of need for teachers with more than five years of experience was *utilizing the Common Core in agriculture education*. The National Research Council (1988, 2009) stated agricultural teachers need to adapt their programs to the changes in education but also in the world of agriculture. New teachers may not have indicated needing assistance incorporating the Common Core standards into their programs, because they gained that specific knowledge and experience at the university level, leaving more experienced teachers behind in the learning process. Additionally, new teachers were the only group to include classroom management as an area of professional development, because they may be more concerned with discipline and developing a constructive learning environment. Further research should be conducted on teachers' knowledge and understanding of utilizing the Common Core in agriculture education.

Furthermore, we recommend professional development workshops be developed to focus directly on helping new teachers with problem solving and critical thinking skills, managing stress during their first years of teaching, strategies for classroom management, and how to effectively manage workload and their personal life. Research should be conducted to measure the professional development effectiveness in these areas to see if new teachers experienced an increase in their ability to teach problem solving and critical thinking skills, manage or reduce

stress, implement effective classroom management strategies, and balance work and personal life. For teachers with 11-20 years of teaching experience, we recommend professional development workshops be developed to help teachers incorporate the Common Core Standards in the classroom, teach their critical thinking skills, strategies for motivating students, as well as strategies for managing time and balancing workload and personal life. Further research should also be conducted to measure the effectiveness of the professional development to determine the effects of Common Core Standards application and evaluate the effectiveness in the agricultural classroom. Finally, we suggest professional development be targeted specifically for teachers with 20 or more years of teaching experience. Experienced and well-seasoned SBAE teachers need professional development in managing facilities and stress, fundraising, motivating their students, and utilizing Common Core Standards in the classroom. Research and further evaluation should be conducted to determine how teachers manage their facilities, stress, keeping students continually motivated, effectiveness of fundraising efforts, and the level at which Common Core Standards were adequately applied in the classroom.

The only unique difference between agriculture education majors and specific agricultural degrees was agriculture education majors' desire help in motivating their students and non-agriculture education majors would like professional development with their teaching of problem solving skills. Due to the findings, professional development may not need to be different for non-agriculture education and agriculture education majors.

However, both male and female SBAE teachers indicated the need for professional development in the areas of (a) *utilizing the Common Core in agricultural instruction*, (b) *teaching critical thinking*, and (c) *balancing work and personal life*. Balancing work and personal life was also found to be an area of concern for female agricultural instructors in Estepp et al.'s (2014) study. Professional development workshops that focus on helping agricultural teachers effectively balance their time are needed in order to prevent burnout. Additionally, male agricultural teachers expressed managing stress and managing time as areas of need, whereas females need more assistance in teaching problem solving skills and modifying instruction for special needs students. Based on the differing needs of SBAE teachers, males and females would benefit from having different professional development workshops.

Teacher burnout is a major concern for those entering and currently in the agricultural education profession. When looking at length of contracts, SBAE teachers on a 12 month contract experience a greater need in the areas of stress and time management. These findings could help explain why teacher burnout in the agriculture education profession happens on such a frequent basis. By creating professional development to help SBAE teachers manage their time and stress, teacher burnout could possibly occur at a decreased rate. SBAE teachers who only work 10 or 11 month contracts did not express the need for more stress or time management professional development, but rather they desired help on improving their teaching skills in the classroom, suggesting that once teachers hit that 12th month of teaching there is potential for teacher burnout. Moreover, future research should be conducted to determine the effects of having time off and the relationship to stress management, and if a SBAE teacher's contract contributes to stress.

Numerous similarities and differences exist in professional development needs based on the three different regions in Tennessee. All three regions (East, Middle, & West) indicated a need for utilizing the Common Core Standards in agricultural instruction, further implying that all SBAE teachers need help better implementing these standards into the classroom and professional development should be developed as a solution to this need. The eastern and western regions experienced more professional development similarities such as managing stress, managing time, and balancing work and personal life. Since there were no further similarities between the three regions, it may be beneficial to conduct professional development workshops and in-service based on regional needs rather than assuming professional development needs on a statewide basis.

This study should be replicated to see if the results vary over time. Further research needs to be conducted to determine how to best meet SBAE teachers' professional development needs, and findings from this study suggest demographic variables need to be taken into consideration when developing professional development. This is important because a one size fits all approach to professional development may not be the most effective means of improving SBAE teachers' knowledge and skills, which can directly impact student achievement (Shoulders & Myers, 2014).

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