### Volume 53 • Number 4 • 2012

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Aligning Kolb’s Experiential Learning Theory with a Comprehensive Agricultural Education Model

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Experiential learning has been a foundational tenant of agricultural education since its inception. However, the theory of experiential education has received limited attention in the permanent agricultural education literature base. As such, this philosophical manuscript examined Kolb’s experiential learning process further, and considered the implications for experiential learning theory (ELT) in secondary agricultural education. Specifically, the researchers outlined Kolb’s ELT and conducted a telephone interview with Dr. David A. Kolb. Analysis of the interview indicated that experiential learning is a critical component of a comprehensive agricultural education model (i.e., three-circle model). It was explained that experiential learning builds meta-cognitive skills and can be goal-oriented and assessed. However, agricultural educators must be present and purposeful when providing experiences for students. Additionally, they must ask reflection questions (e.g., “What happened?” “Now what?” “So what?”) during each phase of ELT throughout the comprehensive agricultural education model (i.e., classroom and laboratory, Supervised Agricultural Experience [SAE], and FFA). Based on these conclusions, a Comprehensive Model for Secondary Agricultural Education was proposed to include the role of experiential learning more intentionally.

Keywords: experiential learning, agricultural education, Kolb, teacher preparation

Introduction

John Dewey (1938) stated, “amid all uncertainties there is one permanent frame of reference: namely, the organic connection between education and personal experience” (p. 25). Agricultural education has been experiential in nature since its inception (Cheek, Arrington, Carter, & Randell, 1994; Hughes & Barrick, 1993; Knobloch, 2003; McLean & Camp, 2000; Roberts, 2006; Stewart & Birkenholz, 1991), as made evident by supervised agricultural experience programs (SAE), field trips, student teaching experiences, problem solving methods, and service–based learning (Roberts, 2006). Though the opportunity for involvement in learning experiences is many, Knobloch (2003) purported “the greatest challenge for today’s teachers and students of agriculture is to move beyond the ‘doing’ and ensure that all learning is connected to thinking and knowledge that will be easily remembered and applied later in life” (p. 31). It is important to not overlook the last word in experiential learning, and that is learning.

Dewey (1938) explained that, “A primary responsibility of educators is that they not only be aware of the general principle of the shaping of actual experience by environing conditions, but that they also recognize in the concrete what surroundings are conducive to having experiences that lead to growth” (p. 40). Contrasting this sentiment, Roberts (2006) asserted that despite the robust use of experiential learning in agricultural education, “the theory behind the practice of experiential learning has had limited attention in the
permanently agricultural education literature” (p. 18). The concept of experiential learning has been applied to a multitude of contexts in agricultural education, which has led to some misunderstanding and a lack of common verbiage around the topic (Roberts, 2006). Meaningful discussions have been further hampered in that the terms have been used to describe many different teaching approaches including field work experiences, internships, previous work experience, outdoor education, adventure education, vocational education, lab work, simulations, and games (Itin, 1999, p. 91). Roberts (2012) posed the question, “How do we hang on to the distinctive ways experiential education frames the educational process while at the same time ensuring that it does not become quaint and overly isolated?” (p. 9). He followed with the response, “This is the role of philosophy” (p. 9).

Purpose

This philosophical manuscript seeks to discuss the specific role experiential learning plays in agricultural education through the lens of Kolb’s (1984) Experiential Learning Theory (ELT). In meeting that purpose, the authors: (a) outlined the theoretical tenants of Kolb’s ELT, (b) applied Kolb’s ELT in the context of agricultural education, and (c) enriched the current model of agricultural education to include the role of experiential learning more intentionally. The authors examined publications within Kolb’s comprehensive ELT bibliography (Kolb & Kolb, 2005a) in order to glean an in–depth theoretical framework of ELT that is relevant to agricultural education. Finally, the authors then specified the role of ELT in agricultural education by integrating ELT into the existing comprehensive agricultural education model (Phipps, Osborne, Dyer, & Ball, 2008).

Indicative of philosophical research, it is important to note that the purpose is not to furnish irrefutable proofs, but rather to provide concepts to incite further discussions, insights, arguments, and discussions – a show and tell of sorts (Reichling, 1996). Sound philosophical arguments require both analysis and synthesis of concepts and theories, as well as an emergent design or method that provides freedom in the design and delivery, resulting in an infinite number of variations (Reichling, 1996). As such, an analysis of Kolb’s (1984) ELT and a synthesis of those tenants in the context of agricultural education follows.

Analysis of Kolb’s Experiential Learning Theory

Kolb’s (1984) ELT asserted that, “Learning is the process whereby knowledge is created through the transformation of experience.” (p. 38). This perspective of the learning process originated through the work of foundational theorists of experiential learning (Dewey, 1910/1997, 1934, 1938, 1958; Freire, 1974; James, 1890, 1907; Lewin, 1951; Rogers, 1961) who placed intentional action based on subjective experience at the center of learning (Kolb & Kolb, 2009). Kolb and Kolb, (2005b) noted six propositions shared by these scholars that served as the foundation for ELT. First, learning is conceived best as a process instead of a product. To improve learning, the focus should be placed on engaging students in a process that facilitates optimal learning. This includes providing feedback on the effectiveness of students’ learning efforts. As Dewey (1897) noted, “education must be conceived as a continuing reconstruction of experience” (p. 79). Next, all learning is relearning. A student’s beliefs and ideas on a topic must be considered so they can be drawn out, tested, examined, and integrated into the new concepts. Third, learning requires the resolution of conflicts between dialectically opposed modes of adaption to the world. Conflict, dissonance, and disagreement drive learning. In the process of learning, an individual is called to maneuver back and forth between opposing modes of reflection and action. Fourth, learning is a holistic process of adaptation to the world that involves more than simple cognition. Learning involves the person as a whole and includes thinking, feeling, perceiving, and behaving. Fifth, learning results from synergistic transactions between the learner and his or her experiences. Using Piaget’s (1971) language, learning occurs through equilibration of the dialectic processes of assimilating new
experiences into existing concepts and accommodating existing concepts into new experiences. Finally, learning is the process of creating knowledge. ELT follows constructivist views of learning in that it is the process of connecting new experiences and knowledge to the learner’s pre-existing personal knowledge. This constructivist approach contrasts the majority of educational practices today, which involves the transmission of ideas that were previously fixed.

These six principles, outlined previously, provide the foundation of Kolb’s (1984) ELT Model (see Figure 1). ELT explains that knowledge results from experiences that have been grasped and transformed (Kolb, 1984). The ELT puts forth two dialectically related modes of grasping experience—Concrete Experience (CE) and Abstract Conceptualization (AC)—as well as two dialectically related modes of transforming experience—Reflective Observation (RO) and Active Experimentation (AE) (Kolb & Kolb, 2009). The result of these two dimensions of learning, apprehension and transformation, are four different elementary forms of knowledge—divergent knowledge, assimilative knowledge, accommodative knowledge, and convergent knowledge (see Figure 1).

Kolb (1984) explained that an experience grasped through apprehension and then transformed through intention results in divergent knowledge. An experience grasped through apprehension and transformed through extension is accommodative knowledge. An experience grasped through comprehension and transformed through intention yields assimilative knowledge. Finally, an experience grasped through comprehension and transformed through extension leads to convergent knowledge (see Figure 1). In order to facilitate learning, not only must the experience be grasped, but it must also be meaningful and relevant (Knapp & Benton, 2006) because students remember knowledge longer when they have experienced it actively (Knapp & Benton, 2006).

Experiential learning occurs through a creative tension between the four learning modes—CE, RO, AC, and AE—that is responsive to certain contexts (see Figure 1). Thus, the learning process is portrayed as a learning cycle where the learner assumes each of the four domains—experiencing, reflecting, thinking, and acting (Kolb & Kolb, 2005b). The recursive process is responsive to each learner, learning experience, and content learned. Immediate or concrete experiences are the impetus for observations and reflections. Reflections are then assimilated and deduced into abstract concepts from which new implications for action are drawn. These new implications are then used for active experimentation, which leads to new concrete experiences (Kolb & Kolb, 2005b).

Kolb (1984) suggested that, “the learning process is not identical for all human beings. Rather, the physiological structures that govern learning allow for the emergence of unique individual adaptive processes that tend to emphasize some adaptive orientations over others” (p. 62). The idea of learning styles describes the individual difference in learning based on the person’s preference for the different modes of learning—CE, RO, AC, and AE. Each individual’s hereditary equipment, particular life experiences, and the current demands of any situation catalyze the development of a preferred way of choosing among learning modes (Kolb, 1984).

ELT argues that an individual’s learning style is, “not a psychological trait, but a dynamic state resulting from synergistic transactions between the person and the environment . . .” (Kolb & Kolb, 2009, p. 315). Kolb (1984) stated that,

The stability and endurance of these states in individuals comes not solely from fixed genetic qualities or characteristics of human beings: nor, for that matter, does it come from the stable fixed demands of environmental circumstances. Rather, stable and enduring patterns of human individuality arise from consistent patterns of transaction between the individual and his or her environment. (p. 63)

Research on ELT has focused on the concept of learning styles, specifically Kolb’s Learning Style Instrument (KLSI) (Kolb, 2007). Though only four learning styles were proposed originally (Kolb, 1984), the instrument has now been expanded to nine to describe various learning preferences better (Kolb & Kolb, 2005b; Kolb & Kolb, 2009). Four of these style types emphasize one of the four learning modes: Experiencing (CE), Reflecting (RO), Thinking (AC), and Acting (AE). Four other learning styles emphasize two of the learning modes, one from the grasping dimension and one from the transforming dimension: Diverging (CE and RO), Assimilating (AC and RO), Converging (AC and AE), and Accommodating (CE and AE). The final style type, balancing (CE, RO, AC, and AE), represents a balance of each learning mode.

In 1991, Boyatzis and Kolb made a distinction between learning styles and learning skills. Though studies show that learning styles vary over short periods of time (Sims, Veres, Watson, & Buckner, 1989), data (Kagan, 1989) suggest that learning styles maintain a longer, more stable nature. In contrast, skills are developed by learning from experience and, as a result, are more variable and subject to intentional personal development. A learning skill is defined as, “a combination of ability, knowledge, and experience that enables a person to do something well within a specific situation and is subject to intentional development” (Boyatzis & Kolb, 1995, p. 2). The focus on learning skills led to the development of the Learning Skills Profile (LSP; Boyatzis & Kolb, 1992) instrument. The LSP instrument correlates each of the learning modes of ELT to a job–related skill type. Divergent knowledge is represented by interpersonal skills. Assimilative knowledge is represented by information skills. Convergent knowledge is represented by analytical skills, and accommodative knowledge is represented by action skills (Boyatzis & Kolb, 1991). The concept of human development is important in order to understand ELT more fully as learning skills can be developed intentionally. Kolb (1984) posited that, “the experiential learning theory of development focuses on the transaction between internal characteristics and
external circumstances, between personal knowledge and social knowledge. It is the process of learning from experience that shapes and actualizes developmental potentialities” (p. 133).

The ELT of Growth and Development (Kolb, 1984) begins with development in each of the four modes of learning. Affective complexity in concrete experience leads to higher–order sentiments; perceptual complexity in reflective observation results in higher–order observations; symbolic complexity in abstract conceptualization results in higher–order concepts; and behavioral complexity in active experimentation results in higher–order actions. The model of development (see Figure 2) is depicted as a cone with the base representing the lower levels of development and the apex representing the peak of development. The cone highlights the idea that, as a person develops, the four modes of learning become more integrated and complex.

Further, the developmental process is broken down into three major stages—acquisition, specialization, and integration (Kolb, 1984). Embedded within each major stage, are three forms of consciousness that govern the growth, referred to as performance, learning, and development. These stages relate to maturational stages that occur in humans, as described by Piaget and Inhelder (1969). Kolb (1984) noted that, though the three levels of development appear linear, each individual will progress through the levels at different rates, and many sub–levels based on each individual learner exist.

**Applying Kolb’s Experiential Learning Theory in the Context of Agricultural Education**

Experiential learning is an integral element of agricultural education, but the exact relationship or role of ELT has remained somewhat ambiguous (Roberts, 2006). In order to move beyond the analysis of Kolb’s ELT explained earlier, and into the synthesis of ELT in agricultural education, it is important to discuss the relationships between ELT and agricultural education. Collaboration with David A. Kolb helped clarify the connection of ELT in the context of agricultural education, allowing movement from analysis to synthesis. Collaboration led to the conclusion that experiential learning should: (a) encompass each of the three components of the agricultural education model, (b) require purposeful and planned support from the agricultural education instructor, (c) lead to the development of important meta–cognitive skills, and (d) include curriculum planning and assessment.

**Experiential Learning Should Be Infused Into the Three Components of the Agricultural Education Model**

The experiential learning model, when placed on the agricultural education model, illustrates the total learning experience of agricultural education. Agricultural education has a great advantage in that the entire program is so easily experiential. Most classrooms today are very sterile environments and the opportunity to move outside of the classroom into relevant agricultural contexts is exactly what education needs. Although, traditionally, SAEs have been referred to as the experiential component of the agricultural education model (McLean & Camp, 2000), each of the three components included in the agricultural education model must encompass rich experiences. The experiential learning cycle provides a good framework to compliment the existing agricultural education model. The three components of agricultural education fit nicely into the experiential learning cycle. The formal instruction seems to be more related to the abstract, where FFA is more of the concrete and reflective component. The SAE is more the field project or the whole achievement converging aspect. In general, agricultural education teachers are naturally covering a lot of the learning emphasis on the different modes of the learning cycle.

A direct connection between what is being taught in the classroom and the student’s SAE project is insignificant. What is most important, however, is allowing students to identify an area of interest or passion and assisting them in building a project around that area of interest. Once student interest is achieved, an instructor can deliver content in the formal setting of the classroom in a way that helps students transfer learning from one experience to another (i.e., SAE and classroom). There is meta–learning that is going on there about how to solve problems on your own, and how to implement a plan. That is kind of independent of what the project is about. Operating from the learning how to learn template, if a beef production SAE is delivered at a high level, it can be transferred to a diversified crop SAE in terms of the use of similar meta–skills.

Teachers begin to see meta–skills emerge as students are provided opportunities to take personal responsibility in achieving the goals of a project over time. The purpose of the SAE should be to build student interest and develop important meta–skills—both of which support the classroom and FFA components also.
Experiential Learning Requires Purposeful Support from the Instructor

Teachers must be present and mindful throughout the experiential process in order to guide and direct the learning process. The instructor is called to connect with students’ prior knowledge and play different roles during each phase of the experiential learning model. Throughout teacher education, it is important to emphasize that students are learning all the time. These are principles of experiential learning – that you are learning all the time, and that their role as a teacher is to capitalize on the experiences they are having and help them reflect together about them and make sense of them. Experiences are very useful ways of helping with the personal development and moral development of students.

All learning is experiential. Listening to a lecture is an experience, and sometimes a very powerful one. The term experiential learning is redundant. Learning is a concept that is built upon how experiences change people. However, the experience itself does not constitute learning. Rather, the learner must reflect, draw abstractions, and experiment actively using the newly constructed knowledge to transform learning.

When a teacher connects to the student’s prior knowledge and personal interest, the learning is more enduring and there is more of it. One of the primary goals of an educator must be to start with the student’s understanding and build on that. Educators tend to overstructure experiences and should remember that adequate learning space must be provided for students to experience and connect to their personal interest. It is important for teachers to be mindful of how students are making sense of what they’re looking at. It is critical that the teacher be present for these experiences in order to serve as a constant guide helping students construct meaning. Learning can really start anywhere, but to have a full learning cycle, it is important to go through all the learning modes, in some way or the other, not necessarily in order. Instructors should teach around the cycle, and teach to all learning modes at some point in the curriculum.

One of the biggest disconnects in the use of experiential learning is the missing connection between the teacher and the experience. The agricultural educator plays an important role during each phase of the learning cycle. From concrete experience to reflection, the teacher’s role is facilitator. They are drawing out the student and their interest, and then from reflection to abstraction, the teacher’s role is subject expert – making the connection between what they have experienced and observed and the concepts the agricultural educator wants to teach. And then from abstraction to action, the teacher’s role is evaluator or standard setter sharing with students the goals you need to achieve and the right answers, so to speak. From action up to experience again, it is a coach that is applying the knowledge back into your experience. It requires a coaching perspective in which the teacher stands back and watches what the person does and helps them do it better.

Experiential Learning Leads to Meta-Cognitive Skill Development

Teaching and developing meta-cognitive skills supports both the learning process and the overall growth of agricultural education students. An educator has at least two goals: (a) to teach people the content, and (b) to teach them how to learn it. One way to do that is to focus on meta-cognition as a component of the curriculum. Using the KLSI (Kolb & Kolb, 2005c) as a platform for discussing how each student learns. The more students know about learning, the better. If students are challenged to move through all four learning modes in the experiential learning model, they are building their meta-cognitive abilities constantly.

How exactly can this development of meta-level skills be assessed or validated? One solution is to change the focus of outcome evaluations. Move beyond assessing concepts or ideas – learning the material, and extend assessment to measuring meta-cognitive or meta-level skills that students are developing. Planning, goal setting, persistence and self-direction are examples of meta-level skills. A more detailed list of meta-level skills are noted and assessed in the LSP (Boyatzis & Kolb, 1992).
Experiential Learning Requires Purposeful Curriculum Planning and Assessment

Experiential learning curriculum, when designed and executed properly, can have positive effects on both formal and informal assessments. There is evidence to support the idea that experiential learning produces results that are better than traditional educational models. This assertion was supported through the mention of studies (Ash & Clayton, 2004; Eyler & Giles, 1999; Eyler & Halteman, 1981; Steinke & Buress, 2002; Steinke & Fitch, 2003) that have examined the effectiveness of experiential learning on knowledge retention in a number of domains.

Experiential learning can be goal-oriented and standards-based. Educators have objectives that need to be communicated, and students can be directed to those goals as teachers serve the role of evaluator mentioned earlier. Consider an agricultural education course with learning objectives related to lake ecosystems. The curriculum would include a concrete experience, which could include a trip to a local lake, a video, or a guest speaker. This experience would then be reflected on purposely through journals that noted what individual students found interesting. Following that reflection, the teacher would make conceptual material available about the targeted information in the lesson guiding students gently to the intended learning outcomes. Finally, students would apply some kind of action application based on what they learned. This might take the form of a lake clean up day or informational school presentation, which correlates with a curriculum goal or objective upon which learning activities are planned around the learning cycle. In terms of assessment, students could write an essay about the trip to identify if the intended goal was achieved. Teachers could also use a typical objective assessment. Though experiential learning may be more time and effort intensive, it produces richer, more enduring learning.

As a final point to consider, educators should be aware of the tendency for standards to dictate classroom experiences, or lack thereof, to the point where students are able to master and do well on the test, but will totally forget the content because it is irrelevant to their life and their goals. Agricultural education is at an advantage in that it is so easily experiential, and that strength should not be ignored.

Synthesis: Overlaying Kolb’s Experiential Learning Theory on the Agricultural Education Model to form a Comprehensive Agricultural Education Model

Traditionally, educators have identified SAE programs as the primary experiential learning tool in agricultural education (Benson, 1981; Cheek et al., 1994). However, Kolb (1984) asserted that all learning is experiential. Thus, experiential learning plays an integral role in the entire agricultural education model, not just the SAE component. Croom (2008) concluded, “for the [agricultural education] model to be successful to a significant degree, there must be a commitment by all stakeholders to deliver all components collectively” (p. 118). To that end, the Comprehensive Model for Secondary Agricultural Education (see Figure 3) was proposed in order to operationalize the role of experiential learning further in relation to agricultural education. The purpose was not to propose a new model for agricultural education, but rather to enrich the current one. It is the hope of the authors that their work can be additive and useful to secondary agricultural teachers as a means of justifying the nature of their jobs (i.e., teaching in an experiential manner).

At the core of the model is the idea that the experiential learning cycle is embedded in each of the three circles. Drawing on the work of key theorists (Dale, 1946; Etling, 1993; Joplin, 1981; Steinaker and Bell, 1979), Roberts (2006) suggested that experiences occur in unique contextual settings. In order to foster a better understanding and vocabulary around experiential learning in agricultural education, each experience should be defined through four dimensions: the level, the duration, the intended outcome, and the setting (Roberts, 2006). This definition is implied in the Experiential Agricultural Education Model as each component of the model represents experiences in different contexts. For example, a student may be involved in an Introduction to Agriscience class (Instruction) which could be defined as a formal setting, focusing on abstract
concepts, over the period of one semester, with the goal of exposure and participation to key agricultural concepts and FFA opportunities. Another student may be involved with their SAE project, in a non–formal setting, more focused on concrete skills, over the course of four years, with the goals of internalization and dissemination around their specific interest and career choices.

Figure 3. Comprehensive Model for Secondary Agricultural Education

Phipps et al. (2008) suggested three questions that should follow any concrete experience: (a) What happened?, (b) So what do I conclude?, (c) Now what do I do? These questions are fundamental in guiding instruction experientially. As such, students should be provided the opportunity to choose an area of interest, engage in concrete experiences, think about those experiences, build abstract concepts with the aid of their instructor, and utilize the learning as they continue to experiment actively. For example, if a student has chosen to exhibit a steer, he or she must have the opportunity to groom that animal on his or her own. Following that experience, the student should reflect by asking, What happened? With help from his or her advisor, the student should then develop abstract concepts about the grooming process, and try it again with the newfound knowledge.

Classroom and laboratory experiences, including guest speakers, research projects, science experiments, greenhouse or school farm work, and group projects provide the impetus for the experiential learning process. Students
should reflect on the knowledge provided by their instructor, connect that reflection to abstract academic concepts, and experiment actively with that knowledge in new contexts. Experiential instruction can be directed and standards–focused through the instructor’s role as evaluator during the abstract conceptualization phase. As discussed earlier, it does not matter where instruction begins in the cycle so long as students are exposed to all four modes of learning. In order to optimize learning from FFA experiences, students must also pass through each of the learning modes. For example, the National FFA Convention may serve as a powerful, concrete experience. However, it is critical that students reflect on that experience, whether through group discussions, a daily journal, or another method. Those reflections will lead to abstract concepts. Then students experiment actively with their newfound theories through opportunities afforded by their local chapter.

An important component to this model is learning/development space as described in Bronfenbrenner’s (1977, 1979) work on the ecology of human development. Bronfenbrenner (1977, 1979) defined the ecology of learning/development spaces as a topologically nested arrangement of structures, each contained within the next. A learner’s microsystem includes his or her immediate setting, while the macrosystem refers to overarching institutional patterns and values of the wider culture. The proposed model (see Figure 3) contains a student’s microsystem, contained within the three inner circles, and macrosystem depicted with a dotted line surrounding the entire three–circle model. The macrosystem, in the proposed model, is not static, but rather is moving constantly as a student progresses through various aspects of agricultural education, and represents the more holistic, long–term experience of agricultural education. This macrosystem growth and development that occurs is depicted in the Growth and Development Model for Secondary Agricultural Education (see Figure 4).
As students participate in the agricultural education program, including classroom instruction, SAE, and FFA experiences, their behavioral, symbolic, affective, and perceptual complexity increases. As students reach the pinnacle of the cone, the four modes of learning become more advanced and complex. This is depicted in the Agricultural Education Growth and Development Model by the juxtaposition of the experiential taxonomy (Steinaker & Bell, 1979) alongside the developmental model indicating that as students progress through the full agricultural education model they should be moving from exposure to dissemination. For example, first–year students are exposed to various opportunities and by the fourth year, dissemination should be evident through students influencing and growing the agricultural education program in their school. Interestingly, the experiential taxonomy proposed by Steinaker and Bell (1979) closely resembles the developmental process derived from Piaget & Inhelder (1969) and embedded in the Experiential Learning Theory of Growth and Development (Kolb, 1984), which was presented earlier (see figure 2). Based on this model, students fully participating in the agricultural education program should move “from a state of embededness, defensiveness, dependence, and reaction to a state of self–actualization, independence, pro–action, and self–direction” (Kolb, 1984, p. 140).
Reflections

Agricultural education is uniquely poised to help students through an effective model of instruction that is experiential by nature. However, simply providing experiences does not constitute learning (Dewey, 1938; Kolb, 1984). As suggested by Roberts (2006), educators must understand ELT fully to effectively operationalize core concepts during instruction. It is imperative that experiences provided in agricultural education, from the livestock exhibition ring to the laboratory activity, and from the state FFA convention to the chapter FFA banquet, include purposeful reflection, gentle guiding toward abstraction, and an opportunity for students to experiment actively with their new found learning. Too often, a myriad of concrete experiences are offered, but valuable meaning is lost due to a lack of purposeful processing. Though this process may take more time and effort, the result constitutes more enduring and relevant learning. To support experiential learning properly, teachers must be present and purposeful with their instruction. Learning outside of the classroom can have value, but teachers must remain focused on the fact that a key tenant of experiential learning is that students are learning, and not just enjoying an experience (Knobloch, 2003; Kolb, 1984). Teachers who desire to implement the learning cycle must be facilitators, experts, evaluators, and coaches. It is important that the instructor begin the experience with the student’s interests in mind so students can draw meaning from the experience.

Experiential learning builds meta-cognitive skills (Kolb & Kolb, 2009). As such, an important part of learning should always be learning how to learn, and the KLSI (Kolb & Kolb, 2005c) can support teachers in that process. Students should be provided the opportunity to understand how they learn and the process involved in making meaning of various experiences. Experiences in agricultural education should be goal-oriented and measurable. Today, more than ever, standardized tests and specific standards–based curriculum are the focus of schools. Experiential educators must balance goal-orientation with the “learning space” associated with experiential learning. Educators must be careful to not over structure instruction to the point where concepts become completely irrelevant and are not retained by students. Congruent to this idea, Knobloch (2003) asserted that,

Agricultural educators who engage students to learn by experience through authentic pedagogy will most likely see the fruits of higher intellectual achievements, not only in classrooms and schools, but more importantly, in their roles as adults as contributing citizens of society. (p. 32)

Praxis

The following recommendations for practice are made:

1. Professional development should be offered to ensure that agricultural educators are able to process experiences better in each of the three components of the agricultural education model (i.e. classroom/laboratory instruction, SAE, and FFA).
2. Teacher preparation programs should utilize the Comprehensive Model for Secondary Agricultural Education proposed in this study to emphasize the role of experiential learning in all aspects of agricultural education more intentionally.
3. Teacher preparation programs should prepare teachers to serve as coaches, facilitators, subject experts, and standard setters while teaching experientially in both formal and non–formal settings.
4. Pre–service agricultural education programs should integrate the KLSI into the curriculum to build an awareness of students’ preferred learning styles.
5. Secondary agricultural education instructors should clearly define the context in which various experiences occur in order to better plan, deliver, and assess learning.
6. Secondary agricultural education instructors should assist students in developing meta–level skills such as planning, goal setting, persistence and self–direction to increase their meta–level skills per the LSP.
7. Agricultural education programs should utilize the Growth and Development Model for Secondary Agricultural Education to conceptually design and plan experiences allowing students to progress through the experiential taxonomy.

8. Assessments should be developed to equip agricultural educators better in evaluating student experiences objectively (i.e. rubrics for reflection and authentic and performance–based assessments).

**Recommendations for Future Research**

Though there is enthusiasm for experiential learning, a paucity of research exists demonstrating the effects of experiential learning methods on learning in secondary education, including agricultural education. Experimental studies should be conducted to determine the effect experiential learning techniques (i.e. moving students through the four modes of learning in a recursive spiral) have on students’ learning and retention. Future research should compare students who encounter a series of experiences in agricultural education to those who learn the same concepts in a lecture–based format. Retention of knowledge should be measured to determine the long–term impacts of experiential learning on student memory. Another important question to be investigated is to what extent are meta–level skills learned across the three components of the agricultural education model? The answers to this question hold implications for the value of agricultural education writ large. Which part of the comprehensive model is most impactful to students in regard to learning and acquiring important meta–level skills? Finally, investigating various strategies of reflection and abstraction would provide evidence informing teachers how to gently guide students through experiences most effectively.

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Using a Preflective Activity to Identify Faculty Beliefs Prior to an International Professional Development Experience

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Today’s college graduates in agricultural and life sciences must be prepared to work in a global society. Increasing the integration of international content into on–campus courses requires globally competent faculty members. This study reports faculty’s initial attitudes and beliefs about Latin American culture prior to participating in a 12–day professional development experience in Costa Rica and what they expected to gain from the international experience. A basic qualitative design was used for this study. Ten agricultural and life sciences faculty at the University of Georgia were included in the population. A survey instrument with four open–ended questions was used for data collection. Content analysis was used to analyze the data and trustworthiness was maintained by including an audit trail, triangulation, acknowledgement of researcher bias, and member checks. Three major themes (and several subthemes) emerged from the responses to the question on attitudes and beliefs about Latin American culture: U.S comparisons, beliefs about the country/region, and Latin American values. The preflection process and results should be integrated into international faculty experiences and used to help participants and trip organizers maximize faculty learning, and, ultimately, student learning.

Keywords: global competency; teaching; study abroad; preflection; faculty

This project was supported by Higher Education Challenge Grant no. FLAE–2009–00865 from the USDA National Institute of Food and Agriculture.

Introduction

Today’s college graduates in food, agriculture, natural resources, and related sciences must be prepared to work in a global society. Recognizing this need, the National Research Council (2009) called for increasing students’ global competence by (a) increasing international experiences for students and (b) by integrating international content into on–campus courses. This study focuses specifically on the latter goal. To begin, it is reasonable to assume college faculty are a key factor in this pursuit, as these changes cannot happen without globally competent faculty members who are willing to be active participants in the curriculum internationalization process. In fact, faculty are “the major agents of change in reforming curricula, renewing themselves, and improving instruction” (Lunde, 1995, p. 2) and have
historically been key in most curriculum internationalization efforts (Association of International Education Administrators [AIEA], 1995).

Internationalizing the college curricula may sound like a worthy goal, but as with any change, numerous issues influence success. Navarro (2004) studied the factors that affect participation of faculty in the internationalization of the curriculum and found eight core factors: (a) context, culture, and environment; (b) support by administration; (c) priorities of faculty (including the value they assign to internationalization); (d) state of the curriculum and available tools/strategies for curriculum change; (e) incentives given for faculty participation; (f) pedagogy, technical, international, and other professional development opportunities available to faculty; (g) resources available; and (h) perceived needs. In examining key strategies to enhance faculty participation in the process of curriculum internationalization, Navarro highlighted two approaches: (a) support from the administration (leadership, vision, guidance, resources) and the institution (inclusion in reward system, flexible leave policies, grant programs); and (b) pedagogy, technical, international, and other professional development opportunities for faculty.

Deficiencies in faculty training and global competency were found as major barriers for quality curriculum internationalization as early as the 1990s (American Council on Education, 1996; Mestenhauser & Ellingboe, 1998). The need for continued investment and focus on pedagogical preparation (Robson & Turner, 2007; Van Gyn, Schuerholz–Lehr, Caws, & Preece, 2009) and international experiences for faculty still holds true today (Childress, 2009; Schuerholz–Lehr, Caws, Van Gyn, & Preece, 2007). The current study specifically examined a professional development activity for faculty consisting of a 12–day trip to Costa Rica focused on developing global competency. As noted by Navarro (2004), a professional development experience like this is a key strategy for internationalizing curricula. Understanding the pre–trip beliefs of faculty can provide insight into planning a meaningful professional development experience.

Theoretical Frame

This study built substantive theory by adding a context–specific example to what was already known about learners’ beliefs prior to engaging in an international experience. From a grand–level perspective, this international faculty development experience was developed using a constructivist perspective of learning, assuming that learners socially construct meaning as a result of their experiences (Gergen, 1995). Further, the activities were conducted under the assumption that learning is a complex socio–cognitive process that involves dynamic interactions between the learner, the environment, and other learners (Bandura, 1986; Vygotsky, 1978). Operationally, the activities undertaken in this study were developed using experiential learning theory (Dewey, 1938; Kolb, 1984; Roberts, 2006), based on the principle that learning is a cyclical process whereby current learning experiences are built on prior experiences through the process of reflection. Jones and Bjelland (2004) added to experiential learning theory when they proposed the term preflection to describe a pre–reflection process where learners think about an experience before it happens. This preflection allows learners to explore their own prior experiences and biases that will likely impact the future experience. In the context of this study, members of the Costa Rica Faculty Learning Community (FLC) were the learners and a planned professional development trip to Costa Rica was the concrete experience. Preflection took place several weeks prior to the experience.

Previous Research

The previous research related to international experiences of faculty was examined to provide some perspective on what other researchers had learned in different contexts. Andreasen (2003) explored internal and external barriers to faculty involvement in international activities. External barriers included personal and professional conflicts, time limitations, financial limitations, and language issues. Internal barriers included cultural biases, ethnic prejudices, fears about
other cultures and politics, being introverted, and a sense of American superiority.

Dooley, Dooley, and Carranza (2008) examined barriers for faculty participation in a short–term study tour to Mexico, specifically looking at preflection. When looking at attitudes and beliefs, Dooley et al. identified seven themes: (a) political structure of Mexico, (b) difficulties in collaborating with peers in Mexico, (c) concerns about language, (d) concerns about security and social problems, (e) Mexican people have a rich and diverse cultural heritage, (f) education is not valued in Mexico, and (g) Mexican culture is influenced by its geographic proximity to the United States. Dooley et al. also examined expected gains from the experience, identifying five themes: (a) building collaborative relationships with Mexican peers, (b) enhancing their own academic activities, (c) learning about Mexico and their university systems, (d) recruiting Mexican students to U.S. universities, and (e) building strong relationships with the other U.S. faculty on the trip.

In a related study, Dooley and Rouse (2009) examined the long–term impacts on faculty who participated in the short–term study tours to Mexico. Participants indicated the trips impacted their teaching more than their research. Faculty acknowledged the trips had impacted them personally and professionally, although several people indicated family responsibilities made it difficult to be away.

Hand, Ricketts, and Bruening (2007) studied the benefits and barriers to faculty involvement in international activities. Benefits included professional growth, improved teaching, and increased global awareness. Hand et al. (2007) reported that many faculty viewed their experience as “life–changing” (p. 151). Barriers to participation included costs, resources, and time. Faculty specifically mentioned that professional and family commitments made it difficult to participate.

Viers (2003) investigated U.S. faculty involvement in international scholarship. Viers identified five themes that contribute to faculty involvement. These included: (a) working at an institution that encouraged internationalization, (b) involvement with international students and faculty at one’s home campus, (c) colleagues who valued international activities, (d) having strong study–abroad and international programs at one’s home campus, and (e) having a supportive spouse. Viers also identified three factors that constrained faculty involvement in international scholarship: (a) one’s current roles as a faculty member, (b) personal and family obligations, and (c) institutional hurdles.

Schuerholz–Lehr (2007) studied the degree to which faculty international and professional experiences translate into global and cultural competence, and classroom practice. While international experiences (personal or professional) often shape and enhance faculty global competence, “such knowledge and high levels of personal capacity and experiences rarely seem to translate automatically into more globally inclusive teaching practices” (Schuerholz–Lehr, 2007, p. 200). To bridge the gap between faculty global competence and classroom application, Navarro (2004) proposed workshops be offered where faculty can learn about the teaching and learning process as it relates to internationalization. Navarro also proposed using teaching consultants to assist faculty in identifying course content, learning outcomes, teaching strategies, and the development of learning experiences within an international context. As an example of a model workshop for faculty, Schuerholz–Lehr detailed the University of Victoria (Canada) CRIW. The “course (re)design for internationalization workshop (CRIW) examines the process of designing new courses and redesigning existing ones from a methodological viewpoint, while at the same time applying the lens of internationalization to the course (re)design process” (p. 181).

**Purpose and Objectives**

The purpose of the study was to develop an understanding of the perspectives held by faculty members in a college of agricultural and life sciences prior to participating in a 12–day professional development experience in Costa Rica. Ultimately, this would contribute to helping faculty in food, agriculture, natural resources and related sciences create meaningful engaged learning, which aligns with the priority of the same name identified by the AAAE...
Specifically, the objectives were to describe faculty’s initial attitudes and beliefs about Latin American culture, as well as what they expected they were going to gain from the international experience. It should be noted that the use of the term “initial” was used in reference to participants’ attitudes and beliefs “marking the commencement” (Merriam–Webster, 1981, p. 1163) of the professional development experience rather than the first attitudes and beliefs they ever had about Latin American culture.

Methods and Data Sources

A basic qualitative design was used for this study. Merriam (1998) defined the basic qualitative design as one that seeks “to discover and understand a phenomena, a process, or the perspective and worldviews of the people involved” (p. 11). Faculty in a college of food, agriculture, natural resources, and related sciences at the University of Georgia were included in the population.

The ten faculty came from six departments within the college: plant pathology (3); horticulture (2); food science and technology (2); poultry science (1); animal and dairy science (1); and agricultural leadership, education, and communication (1). Collectively, the group was referred to as the Costa Rica Faculty Learning Community (FLC). There were five assistant professors, two associate professors, and three professors in the FLC. There were three females and seven males.

There was a wide range of knowledge and experience among FLC members regarding international experience and Spanish language knowledge. Three of the FLC members had previously traveled to Costa Rica several times for professional reasons; one of them had also traveled to Honduras. Two of the FLC members had international experience but not in Central America. Three FLC members specifically mentioned having very little international experience. Only three of FLC members had at least some command of the Spanish language while the rest did not speak/understand Spanish.

A survey instrument with four open-ended questions was used for data collection. Data collection was conducted in the month preceding the trip as a preflective experience (Dooley et al., 2008; Wingenbach, Chmielewski, Smith, Piña, & Hamilton, 2006). Jones and Bjelland (2004) defined preflection as “the process of being consciously aware of the expectations associated with a learning experience” (p. 963). The responses to two of these questions formed the basis for the findings and discussion that follow. The two questions were:

- What are your initial attitudes/beliefs about Latin American culture? Please describe your thoughts in terms of your top five attitudes/beliefs about Latin American cultural (language, customs, etc.), social, economic, or political issues.
- What do you expect to gain from the international experience?

The research team consisted of six members, five of whom are university faculty. The sixth member was a doctoral candidate at the time of the study and is now faculty. All team members have expertise in agricultural or extension education and are housed in or affiliated with related departments. The research team members have traveled internationally and been involved in international faculty development activities beyond the trip examined in this study. At the time that the study began, three of the researchers were employed by the same university as the study participants, recruited the participants, organized the trip, and collected the data. One of those researchers took another faculty position at a different university prior to the completion of the project, but continued to participate on the research team. The others researchers were from a different university, had limited contact with the participants, and lead the analysis of data. All of the researchers were partners on a USDA Higher Education Challenge grant that funded this activity and all actively contributed to the development of this article.

Content analysis (Lincoln & Guba, 1985) was used to analyze the data. Two coders from the research team were used for the content analysis to lower the amount of observer bias (Lincoln & Guba, 1985). One of the coders did not have any contact with the trip planners or the
participants themselves. This coder was not familiar with the content of the international trip, did not have knowledge of any of the participants, and was not informed of the participants’ previous international experiences. The second coder was a part of the grant project team, had knowledge of the participants’ programmatic area of expertise, and was familiar with the participants’ previous international experiences.

The two coders separated responses into independent units, coded, and individually categorized them into emergent themes prior to reaching consensus. Patterns, themes, and relationships within the data were then identified. At the conclusion of reviewing responses to each open–ended question, the coders discussed the participants’ responses. The two coders performed peer reviews by discussing their personal perceptions and generalizations. Together they came to consensus on consistent patterns, themes, and relationships. After reviewing each set of responses, the coders used the commonalities and disparities in the patterns, themes, and relationships to create a visual representation of the phenomenon. Trustworthiness was addressed by maintaining an audit trail that included raw data, data reduction and analysis products, data reconstruction and synthesis products, and instrument development information; conducting triangulation through the use of multiple investigators; acknowledging researcher bias; and conducting member checks (Lincoln & Guba, 1985).

Results

Initial Attitudes/Beliefs about Latin American Issues

Respondents were asked to describe their top five attitudes and beliefs about Latin American culture. Their responses generally fit into one of three major themes: U.S. comparisons, beliefs about the country/region, and Latin American values. Emergent themes and sub–themes have been italicized for emphasis, and are summarized in Figure 1.

![Figure 1. Themes and subthemes emerging from participant responses to question about attitudes and beliefs about Latin American culture.](image-url)
Respondents framed some of their initial attitudes and beliefs about Latin American culture with comparisons to the United States. One respondent (R5) qualified his/her statement with the phrase “by U.S. standards.” Others (R6, R9, R8) compared topics such as politics, media, how youth spend their free time, and food to what exists “in the United States.” In all cases, respondents indicated they believed the cultural issues were different in Costa Rica and the United States.

Within the beliefs about the country/region theme, a sub-theme of influences on culture emerged. The impact of explorers and invaders on culture was noted in comments such as “Latin American has been exploited since Columbian era by European and North American interests with little regard of the indigenous peoples” (R4) and “because of the influence of so many countries infringing on Central America throughout the last 500 years, I believe that several cultures will be evident in this country” (R6). In addition to European and North American influences, respondents identified “Indian” (R5), African (R4, R5), and South American (R4) influences. The result of many influences on culture was described as “a tremendous level of diversity in Latin America in regards to customs, socio-economic issues and politics” (R3). Respondents believed a single culture did not exist in the region (R2, R3, R5, R6). This sub-theme could be summed up with a statement from one faculty member, “countries in Latin America have rich and diverse cultures” (R5).

A second sub-theme of political influences emerged within the beliefs about the country/region theme. The respondents were not in agreement in how they viewed political influences. One respondent believed Latin America was “less democratic and more ‘top–down’” (R7) while another wrote of “a similar democratic system” to the United States and a “less intrusive” (R6) government. Even respondents who discussed the same aspects of politics looked at them from different perspectives. On the issue of political stability, Respondent 4 said “Some countries have more stable political systems than others in the region” while Respondent 5 said “Some Latin American countries have been destabilized by socio–political unrest.” It was also noted that Nicaraguan immigration is causing “growing difficulties” (R10) in Costa Rica.

Standards of living was the third and final sub-theme that emerged in connection to beliefs about the country/region. Respondents generally believed a class system exists in Latin America (R2, R4, R6, R8) and poverty is common (R4, R5, R6, R8). These beliefs are reflected in the comment that “Latin America has a largely stratified society, with top 1–5% living affluent by Western standards, middle working class with some degree of social and economic comfort, and the largest part of the people living in near subsistence conditions” (R4). The influence of tourism on standards of living (R2) and literacy rates (R10) were noted. Overall, the beliefs of the six respondents who discussed standards of living can be summed up by the respondent who said “the countries in general are poorer than the United States with only a few people holding large amounts of wealth” (R6).

Latin American values was the second major theme that emerged from the data analysis. Within this theme, a focus on family life was evident. The perception of Latin America as a “highly family oriented society” (R10) was noted by two respondents (R8, R10). A perception of dominant males existed, with fewer opportunities for women to take roles outside the home (R1, R9). Instead, the women were expected to be “in charge of the children and maintenance/care of the household (e.g., meal preparation)” (R1). A “focus on what is good for the family, vs. individual members” (R8) was perceived.

Beliefs about the people was identified as the second subtheme within overall Latin American values theme. Latin Americans in general and Costa Ricans specifically were perceived to be “extremely respectful” (R7), “very conscious” (R1) and to “exhibit concern” (R9) for natural resources and the environment. The people were described as “friendly and not in a big hurry” (R10). Additionally, it was thought that “they are less focused on whatever one else [sic] is doing, and more on the issues or activities at hand” (R8). One respondent was
certain that Costa Ricans had “a very different set of values” regarding quality of life, but was interested “to see what they think of the [values] I have, and those that are common in the U.S., such as owning a car, a house, etc.” (R9).

Three respondents (R4, R6, R10) believed religious influences were closely related to Latin American values. Christianity was thought to influence Latin Americans’ “views regarding science and their interaction with people from other counties” (R6). However, another respondent noted that “Latin America has strong Catholic culture today but in Pre–Columbian times, polytheistic beliefs were the norm” (R4). Overall, the three respondents were in agreement that religion was important in the lives of Latin Americans.

Expected Gains from the International Experience

Respondents were asked to describe what they expected they were going to gain from the international experience. A personal learning/development theme and an application to teaching theme emerged from their responses. The personal learning/development theme was further broken out into three sub-themes: orientation to the trip, technical competencies, and intercultural competency. The emergent themes and subthemes from the answers to this question have been summarized in Figure 2.

Figure 2. Themes and subthemes emerging from participant responses to question on expected gains from the international experience.

A learning orientation was evident within the theme of personal learning/development. Respondents expected “to learn” (R1, R4), “learn much more” (R9), and to “gain experience” (R7). They anticipated having “better understanding” (R2, R3, R5) and an increased appreciation (R1, R3, R7, R8) for Latin America as a result of their trip. Two respondents wrote that they expected to “gain better insight” (R5) and “gain more insights” (R6), which indicates they perceived themselves to have some level of insight prior to their international experience.

The respondents’ expectation to learn on their international experience is consistent with the statements they made about increasing their technical competencies. All but one of participants thought they would gain knowledge about specific agricultural practices, such as “organic farming and sustainable practices” (R9), “organic coffee farming practices” (R1), and “how Latin Americans manage the myriad of plant diseases that threaten their crops under highly conducive environmental conditions” (R5). One respondent had an expectation of being able to apply learned practices back in the United States, stating that he/she expected to “learn new techniques and management skills that I can apply to horse farms here” (R8). A more passive sentiment was expressed by the participant who said “I expect to observe agricultural production in the tropics, as well as production of tropical crops such as coffee and tea” (R4).

The majority of respondents described expectations to increase their intercultural competence in addition their technical competencies. There were expectations
expressed about learning about the overall culture, such as the respondent who optimistically wrote “I am hopeful that I will learn how to interact smoothly and comprehend the Costa Rican culture” (R9). Another respondent broadly stated “I expect to learn about the local cultures” (R4). Other cultural expectations were linked to agriculture, as described by the participant who said “I anticipate that I will not only better understand agricultural issues but also appreciate the history of the different cultures and how this is directly associated with the diversity in agricultural practices” (R3). Finally, some respondents (R1, R8, and R9) discussed the social aspects of culture, indicating that they expected to gain “a greater appreciation of the Costa Rican people” (R8), “experience interacting with people whom have different cultural and philosophic views than I” (R9), and “an understanding and appreciation of cultural and philosophic views of Costa Ricans particularly from those in the agriculture sector” (R1).

To a lesser extent, respondents moved beyond their consideration of personal learning and development and thought about application to teaching. Two respondents (R7, R8) discussed hopes for their experience to benefit their students. One of the two respondents was motivated by a desire “to bring these experiences and insights back to the classroom, because I feel a lot of my students are even more blind to international practices than I am” (R8). A third respondent not only intended to “develop teaching materials for use in my classes” but expected to “develop plans for teaching in [Costa Rica]” (R10) as a result of his/her experience.

Conclusions, Recommendations, and Implications

The results of this study demonstrated that a preflective activity can be used to build substantive theory and increase understanding of pre–trip beliefs of faculty. Before the trip, participants were asked to describe their attitudes and beliefs about Latin American culture and indicate what they expected to gain from the international experience. This preflection process served two purposes. The first purpose was intended to serve as part of one of the necessary reflection steps needed for learning (Jones & Bjelland, 2004; see also Dewey, 1938; Kolb, 1984; Roberts, 2006). The second purpose was to serve as a planning tool to help trip organizers develop the trip and the professional development activities planned for the Faculty Learning Community before, during, and after the trip. Results of this inquiry revealed specific beliefs of this group of faculty.

Responses to the question addressing pre–existing beliefs and attitudes about Latin American culture revealed a tendency to compare other countries with the U.S. This propensity to compare was consistent with the barriers identified by Andreasen (2003). The comparisons made by this group of faculty sometimes had no best or worse situations, but when they had value assigned to it, sometimes the winner was the U.S., and sometimes Latin America or Costa Rica. As part of the reflection step for faculty, it is important that they become aware of the tendency to compare so they can use it to challenge themselves to analyze whether or not they can support the comparison with facts. On the occasions that faculty assign a value to the different sides of the comparisons, they should be pushed to determine whether or not assigning a value affects their attitude, ability to further their learning or exploration of the issue, and behavior. Trip organizers need to be especially cognizant of these comparisons, examine them, and address any attitudes that may hinder or help the development of global competencies by providing meaningful faculty development experiences that challenge negative attitudes and build on positive attitudes.

Most respondents made comments that addressed the diversity and richness of cultures in Latin America. This belief was consistent with what Dooley et al. (2008) found in regards to the faculty they examined. Recognizing this is an example of a belief shared by many of the participants could be used by professional development designers as a positive prior knowledge to build upon to further learning. For example, trip organizers could ask participants to analyze and discuss how they could use the diversity and richness of cultures in Latin America to determine curriculum content or instructional strategies. For other topics, such as
with the sub-theme of political influences, respondents were not in agreement in how they viewed political issues. This difference of opinions could be used by trip organizers to challenge participants to read about the topics and discuss later with the group whether or not further reading and analysis caused them to solidify or change their opinion, and how the new knowledge could help them infuse new concepts into their curriculum. In addition, the topic could be revisited after the trip in discussions surrounding how document exploration and personal experience in the country impacted their new beliefs and attitudes. Further, professional development designers can use topics where there is a difference of opinions to help faculty reflect on the origins and causes of their beliefs, and analyze how similar issues can affect their students in different ways.

Most respondents had positive attitudes toward Latin American values, and most specifically its peoples. On the surface, this may seem inconsistent with previous research that reported negative attitudes about a nation’s people and values were impediments to participation in an international experience (Andreasen, 2003; Dooley et al., 2008). However, it is important to recognize that participants in this study had already committed to an international experience and thus likely had favorable attitudes a priori. It is plausible that faculty who elected to not participate in this activity viewed Latin American values and people as a barrier to participation. Trip organizers should consider the beliefs of potential faculty participants when recruiting for similar activities.

Faculty participants also had high expectations for learning and increasing their intercultural competency. This theme is a common thread through much of the existing literature and is widely viewed as a benefit or incentive for participating in such an experience (Dooley et al., 2008; Dooley & Rouse, 2009; Hand et al., 2007). Trip organizers can build upon this positive attitude and include a good number of opportunities for faculty to interact with people from Costa Rica (before, during, and after the trip). The interaction will help add personal development and meaning to a professional endeavor, and help with learning at the affective domain in addition to the cognitive domain (Dirkx, Anger, Brender, Gwekwerere, & Smith, 2006).

The questions related to participants’ expected gain from the international experience were most valuable in assisting both faculty and professional development organizers to acknowledge and build on faculty expectations, realize and address pedagogical needs of faculty, and help faculty translate their pedagogical and international knowledge and experience into classroom practice (Navarro, 2004; Schuerholz–Lehr, 2007). The analysis of participant responses regarding their gain expectations from the international experience revealed two major response themes: a personal learning/development expectation, and an application to teaching theme. These two findings are consistent with the previous research in this area (Dooley et al., 2008; Dooley & Rouse, 2009; Hand et al., 2007). A learning orientation was evident in most of the responses, both from affective and cognitive perspectives (Dirkx et al., 2006). Regarding the cognitive domain, most of the learning expectations focused on technical, agricultural disciplines, and very little at any of the levels of pedagogical cognition (understanding, application, analysis, and evaluation). The emphasis placed on technical orientation of faculty needs to be acknowledged by faculty and professional development organizers, and should be addressed before, during, and after the trip. It is important that faculty internalize the need to learn about the teaching and learning process, and act upon it. Professional development designers should work with faculty to examine the need for professional development on pedagogy, raise faculty expectations about gains from the trip regarding the teaching ability and curriculum development to enhance student global competency, and, most importantly, prepare opportunities for faculty to learn, apply, and evaluate how to bridge the gap between faculty global competence and their ability to translate this competence into their curriculum and teaching practices (Navarro, 2004; Schuerholz–Lehr, 2007). Thus, continuing to work together after the trip to incorporate international experiences into teaching, develop curriculum, design learning opportunities for
students, and refine teaching strategies, is of foremost importance to translate faculty global competence into teaching practice and student learning.

In sum, it is recommended that the preflection process and results be integrated into international faculty experiences and used to help participants and trip organizers (a) recognize pre–existing beliefs and attitudes that may help or hinder the development of global competencies, and provide meaningful experiences that challenge these pre–conceptions; (b) acknowledge and build on faculty expectations; (c) realize and address pedagogical needs of faculty; and (d) help faculty convert into classroom practice their pedagogical and international knowledge and experience. With appropriate analysis of, and responses to, preflection results, trip organizers can maximize faculty learning before, during, and after the trip, and enhance application of experiences into teaching and teaching ability of faculty, and, ultimately, student learning.

The current study adds to the literature on developing global competence of faculty in food, agriculture, natural resources, and related sciences. However, this topic has yet to be examined in sufficient detail to provide a complete understanding of this phenomenon. Additional research is warranted with other groups of faculty before, during, and after international professional development activities. A few pressing questions include the following. How do pre–trip beliefs influence the quality of experiences had on the trip? How do beliefs change after a trip? How does a trip impact faculty? Are there observable changes in faculty beliefs and behaviors over the course of a trip?

References


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Perceptions of Teaching Ability During the Student Teaching Experience in Agricultural Education

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The purpose of this study was to describe the views student teachers in agricultural education at Oklahoma State University had regarding their 12–week student teaching internship. Using Q–methodology as a research approach, 28 interns rank–ordered a Q–set of 36 statements describing various aspects of teacher responsibilities and performance. The completed Q–sorts were factor analyzed resulting in three distinct teaching views found in the sample: Emerging Teacher, Self–Assured Teacher, and Determined Teacher. The Emerging Teacher view recognized areas needed for growth and development but also recognized their progress toward becoming a professional. The Self–Assured Teacher view had a high level of comfort and confidence in their teaching ability, which extended to their views on developing lessons and teaching across the agricultural education curriculum. The Determined Teacher view recognized confidence but not comfort in their teaching ability. Teaching did not always come easy for them, but they recognized they were getting better. Study results suggested all three groups attained their views from different sources of self–efficacy. Recommendations were made to provide continued training and/or professional development tailored to each view, as well as, to seek the viewpoints of the cooperating teachers.

Keywords:  student teaching; Q–method; views; teaching ability; self–efficacy

Introduction

Student teaching is one of the most commonly and widely used components in the teacher preparation process nationally (Carnegie Forum’s Task Force, 1986). It is a culminating internship that provides experiential learning during the preparation process. The student teaching internship exposes interns to the same experiences they will encounter as a full–time teacher.

Time and experience are central to the growth and development of intern teachers (Spooner, Flowers, Lambert, & Algozzine, 2008). However, as graduation requirements have decreased, exposing pre–service students in agricultural education to real–life challenges has become problematic (Burris, Robinson, & Terry, 2005). In Oklahoma, the graduation hours have been reduced at the same time other teacher preparation requirements expanded (such as diversity and health issues). This limits the amount of time available to provide vital learning experiences to future teachers. The lack of potential learning experiences could lead to lower levels of student proficiency, which then could diminish teachers’ levels of confidence or self–efficacy related to their teaching.
Self-efficacy beliefs influence specific domains or contexts, such as a person’s ability in teaching. Tschannen–Moran, Hoy, and Hoy (1998) provided a definition of teaching efficacy as, a person’s “belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context” (p. 233).

Though experiences during the student teaching internship vary from person to person, it is through these experiences that interns gain information about their teaching performance. Bandura (1986, 1997) described four main sources by which efficacy is built: mastery experiences, vicarious experience, social persuasion, and physiological and emotion state. Mastery experiences are particularly influential to interns through the practice of teaching, while vicarious experiences are also influential through the observations of model or expert teachers. Social persuasion involves the formation of efficacy beliefs through others’ suggestions about a teacher’s performance. A person’s efficacy may be affected by his/her emotional or physical state, that is, stress, fear, and anxiety may influence a person’s vulnerability thereby lowering the appraisal of efficacy.

Self-efficacy regarding an individual’s perception about his/her teaching ability is an important phenomenon to understand because “once efficacy beliefs are established, they appear to be somewhat resistant to change” (Tschannen–Moran et al., 1998, p. 235). As such, it is important to assess student teacher self-efficacy while these individuals are still at the pre-service level (Korthagen & Kessels, 1999) so that efforts can be made to improve the preparation they encounter during their teaching practice experiences (Pajares, 1992).

Although teacher efficacy is a powerful construct, it has been difficult to measure (Tschannen–Moran & Hoy, 2001); several methods of measuring efficacy have been employed. These include the smaller two-item scale used in the Rand Corporation studies (Armor et al., 1976; Berman, McLaughlin, Bass, Pauly, & Zellman, 1977) to the larger 24-item scale used in the Teachers’ Sense of Efficacy Scale (Tschannen–Moran et al., 1998). However, Bandura (1997) warned that instruments with few measurements are too global and instruments that are too specific become less generalizable. Other researchers have suggested that employing a variety of research methods, including qualitative inquiry, would serve to enrich the understanding of teacher efficacy (Henson, 2002; Labone, 2004; Tschannen–Moran et al., 1998).

Need for the Study

Due to the need to measure self-efficacy both quantitatively and qualitatively, Q-methodology was deemed to be a logical approach. Q-methodology is a qualitative research method with quantitative features (Watts & Stenner, 2003). This method could serve to study teacher efficacy through means of internal subjective opinions about self that have been overlooked previously. Q-methodology seeks to interrogate the phenomenon holistically by allowing participants to model their preferences in a Q-sort instead of reacting to one measure at a time (Brown, 1980).

Purpose and Research Question

The purpose of this study was to describe the views student teachers in agricultural education at Oklahoma State University had regarding their 12-week student teaching experience. To accomplish this purpose, this study explored the perceptions of agricultural education student teachers in the spring and fall semester of 2009 regarding aspects of self-efficacy. The research question was, what views did agricultural education student teachers have about their teaching ability?

Methodology

Conceptually, this study was based on Bandura’s self-efficacy theory (1993). Bandura’s work underpinning self-efficacy (1997) described extensively how an individual’s perceptions of his or her ability is self-referent. “Q-studies, from conception to completion, adhere to the methodological axiom that subjectivity is always self-referent”
Specifically, subjectivity is the communication of a person’s viewpoint, and self-reference is a person’s internal frame of reference (McKeown & Thomas, 1988). Q–methodology was developed originally by William Stephenson in the 1930s as a research method to study human subjectivity systematically. The quantitative portion of Q–methodology is an adaptation of a factor analysis (Watts & Stenner, 2005) and provides researchers a systematic method to study the mathematical structure of a group of people who hold a specific viewpoint, attitude, and/or belief on a chosen topic (Brown, 1993). Unlike other correlational measurements, in which data are often gathered from opinion questionnaires with standardized scales (Robbins, 2005), Q–method allows for the items to interact (Brown, 1980) according to the sorter’s view. The holistic approach is accomplished by allowing participants to compare each statement to the others rather than rating each statement individually.

Participants

The participants for this study were 28 interns in agricultural education who were enrolled in a student teaching course at Oklahoma State University during the spring and fall semesters of 2009. The Q–sort was completed by each intern within the span of weeks nine through 12 of the student teaching internship. Data were collected by the university supervisors during the observational site–visits made to the internship location or by appointment on the university campus.

Instrument and Data Collection

The Q–set is a group of statements presented to the participants for rank–ordering (McKeown & Thomas, 1988) and is representative of several aspects or viewpoints of a topic (van Exel & de Graaf, 2005). This study used a combination, or hybrid approach, involving both naturalistic and theoretical types. A total of 36 statements were used to develop the Q–set. Of those, 30 originated from a validated instrument, The Teaching Ability Questionnaire (Spooner et al., 2008). To provide breadth to the Q–set, six additional naturalistic statements were added based on informal discussions and debriefings between the researcher and several semesters of student teachers. In total, all the statements represented multiple roles of teacher performance, which revealed the participants’ perceptions of their teaching ability as they sorted, according to How do you feel about the courses you instruct? Interns sorted the Q–statements efficiently by first starting with three distinct piles (most like, most unlike, and neutral reactions). Then, statements were placed on a form board with the nine–column distribution value from -4 to +4 with the number of statements in each column as 2–4–5–6–5–4–4–2 (see Figure 1).

![Figure 1. Q–sort Form Board](image-url)
placed on the board by each intern. Finally, the placement of the statements was recorded onto the response sheet for data analysis. Space was available for the interns to add written comments about their perceptions of their teaching ability, as well as personal characteristics. When completed, the researcher checked the accuracy between the placement of the Q-sort statements and the response sheet.

Data Analysis

The data from the Q-sorts for each of the 28 interns were entered into PQMethod (Schmolck, 2002) to develop a correlation matrix, which was factor analyzed using principal component analysis (PCA) and a varimax rotation of three factors to determine the best solution for data that accommodated the most sorts. Twenty-one of 28 sorts loaded significantly on one of three factors. Factor 1 had 12 defining Q-sorts, Factor 2 had five defining Q-sorts, and Factor 3 had four defining Q-sorts. The remaining Q-sorts were identified as non-significant or confounding and did not aid in the interpretation of factors.

Findings

Interpretation of the factors involved an examination of the array of statements created for each factor. The interpretation was constructed by a careful consideration of most like and most unlike statements, both individually and holistically. As the viewpoints began to evolve, consideration was given to distinguishing statements and consensus statements. The final refinement of the viewpoints came with an examination of the interns’ written comments gathered from the response sheet. The three factors were interpreted and named the Emerging Teacher, the Self-Assured Teacher, and the Determined Teacher.

Factor 1: Emerging Teacher

This factor was defined by 12 of the Q-sorts and accounted for 22% of the variance in the analysis. Interns who held this view did not perceive teaching was particularly easy (statement 2, z-score -1.23) (see Table 1). Yet, these individuals recognized they were getting better at teaching (4, 1.56) and perceived they needed less help teaching than before (7, 1.02). In addition, they liked how teaching made them feel overall (1, 1.36). Written comments, which supported this point of view were, “They [my classes] are all good and going great” (participant 6), and “[I] hope that the rest of my experience is as enjoyable” (participant 3). These student teachers recognized they were still growing as a professional (28, 1.72).

This continued growth aspect was emphasized further with the most unlike me placement of two distinguishing statements: “I have enough training to deal with student learning problems” (15, -1.24), and “I know how to individualize instruction” (18, -0.86). Participant 22 said, “I feel that I would have liked to know a little more about which IEP [Individualized Education Plan] students have.” IEPs are implemented in the school system and are designed to meet the particular educational needs or learning problems of a specific student. This participant’s comment can be related back to the growth needed as a teacher in relation to the aforementioned statements concerning individualized instruction and management of student learning problems. In addition, those with this view failed to understand how children learn and develop (14, -0.79). Nor did these student teachers know how and where to refer students with learning problems (16, -0.82). These statements (see Table 1) defined the student teachers’ awareness that they needed more growth in this area.
Table 1
Factor 1: The Emerging Teacher View: High and Low Ranking Statements

<table>
<thead>
<tr>
<th>No.</th>
<th>Most Like Statements</th>
<th>Array Position</th>
<th>Z score</th>
</tr>
</thead>
<tbody>
<tr>
<td>29.*</td>
<td>I feel comfortable with my ability to communicate with colleagues and parents.</td>
<td>4</td>
<td>1.74</td>
</tr>
<tr>
<td>28.</td>
<td>I have learned ways to grow as a professional.</td>
<td>4</td>
<td>1.72</td>
</tr>
<tr>
<td>20.*</td>
<td>I know how to encourage positive social interactions.</td>
<td>3</td>
<td>1.61</td>
</tr>
<tr>
<td>4.</td>
<td>I am getting better at teaching.</td>
<td>3</td>
<td>1.56</td>
</tr>
<tr>
<td>1.</td>
<td>I like how teaching makes me feel.</td>
<td>3</td>
<td>1.36</td>
</tr>
<tr>
<td>21.*</td>
<td>I am able to handle discipline problems in my classroom</td>
<td>3</td>
<td>1.12</td>
</tr>
<tr>
<td>19.</td>
<td>I feel comfortable with my classroom management skills.</td>
<td>2</td>
<td>1.03</td>
</tr>
<tr>
<td>7.</td>
<td>I need less help with teaching than I did before.</td>
<td>2</td>
<td>1.02</td>
</tr>
<tr>
<td>5.*</td>
<td>I am confident in my ability to teach.</td>
<td>2</td>
<td>0.78</td>
</tr>
<tr>
<td>24.*</td>
<td>I feel comfortable with my ability to motivate students.</td>
<td>2</td>
<td>0.75</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Most Unlike Statements</th>
<th>Array Position</th>
<th>Z score</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.</td>
<td>I understand how children learn and develop.</td>
<td>-2</td>
<td>-0.79</td>
</tr>
<tr>
<td>26.</td>
<td>I am able to use prescribed curriculum for instruction.</td>
<td>-2</td>
<td>-0.82</td>
</tr>
<tr>
<td>16.</td>
<td>I know how and where to refer students with learning problems.</td>
<td>-2</td>
<td>-0.82</td>
</tr>
<tr>
<td>18.*</td>
<td>I know how to individualize instruction.</td>
<td>-2</td>
<td>-0.86</td>
</tr>
<tr>
<td>32.</td>
<td>I can construct lesson plans for only the subjects I am comfortable with.</td>
<td>-3</td>
<td>-1.18</td>
</tr>
<tr>
<td>2.*</td>
<td>Teaching is easy for me.</td>
<td>-3</td>
<td>-1.23</td>
</tr>
<tr>
<td>15.*</td>
<td>I have enough training to deal with student learning problems.</td>
<td>-3</td>
<td>-1.24</td>
</tr>
<tr>
<td>35.*</td>
<td>I can teach any agricultural education course.</td>
<td>-3</td>
<td>-1.36</td>
</tr>
<tr>
<td>34.</td>
<td>It is easy to find curriculum materials to instruct with.</td>
<td>-4</td>
<td>-1.43</td>
</tr>
<tr>
<td>33.</td>
<td>I feel comfortable teaching only one or two subjects.</td>
<td>-4</td>
<td>-2.06</td>
</tr>
</tbody>
</table>

Note. The table displays the top ten **most like me** and **most unlike me** statements. *Denotes a distinguishing statement at an alpha level of p < .05.

Student teachers holding the Emerging Teacher view clearly were not comfortable teaching all aspects of agriculture, as defined by the rejection of the distinguishing statement, “I can teach any agricultural education course” (35, -1.36) (see Table 1). Participant 13 wrote, “I am learning in agr[icultural] mechanics and will continue to do so, but basic welding [is] what I am comfortable with now.” Although these student teachers were not comfortable teaching all agricultural education courses, they did indicate strongly their ability to teach several different agricultural subjects rejecting the statement, “I feel comfortable teaching only one or two subjects” (33, -2.06). However, despite any discomfort in teaching across the curriculum, these student teachers had no problem creating lesson plans across the curriculum. This finding is supported by their rejection of the statement, “I can construct lesson plans for only the subjects I am comfortable with” (32, -1.18). Participant 12 explained, “I just have to do my part in researching/studying the topics before I actually teach it to my students.”

Interns who held the Emerging Teacher view perceived they could construct lessons across the curriculum, but finding the materials to do that was not easy (34, -1.43). These student teachers also perceived it was difficult to use prescribed curriculum for instruction (26, -0.82); and when pursuing the creation of their own materials, it was not easy to find curriculum materials with which to instruct (34, -1.43). Unique to this view was a social dimension. Particularly noteworthy were three **most like me** distinguishing statements. These were, “I feel comfortable with my ability to communicate with colleagues and parents” (29, 1.74); “I know how to encourage positive social interactions” (20, 1.61); and “I am getting better at teaching” (4, 1.56).
(20, 1.61); and “I feel comfortable with my ability to motivate students” (24, 0.75). This social dimension of those holding the Emerging Teacher view also trickled down to their comfort with classroom management skills (19, 1.03). Their knowledge in encouraging positive social interactions was emphasized by another distinguishing statement; “I am able to handle discipline problems in my classroom” (21, 1.12) (see Table 1).

**Factor 2: Self-Assured Teacher**

This factor array was defined by five of the Q-sorts and accounted for 17% of the variance in the analysis. Interns who held the Self-Assured Teacher view were confident in their teaching ability (statement 5, z-score 2.19) and classroom management skills (19, 0.84) (see Table 2).

<table>
<thead>
<tr>
<th>No.</th>
<th>Most Like Statements</th>
<th>Array Position</th>
<th>Z score</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>I am confident in my ability to teach.</td>
<td>4</td>
<td>2.19</td>
</tr>
<tr>
<td>3.*</td>
<td>When I teach, I feel satisfied.</td>
<td>4</td>
<td>1.58</td>
</tr>
<tr>
<td>23.</td>
<td>I feel comfortable with my ability to plan instruction.</td>
<td>3</td>
<td>1.37</td>
</tr>
<tr>
<td>2.*</td>
<td>Teaching is easy for me.</td>
<td>3</td>
<td>1.26</td>
</tr>
<tr>
<td>1.</td>
<td>I like how teaching makes me feel.</td>
<td>3</td>
<td>1.15</td>
</tr>
<tr>
<td>6.*</td>
<td>I am relaxed when I teach.</td>
<td>3</td>
<td>1.06</td>
</tr>
<tr>
<td>8.</td>
<td>My students think I teach well.</td>
<td>2</td>
<td>0.91</td>
</tr>
<tr>
<td>12.</td>
<td>My lessons contain meaningful learning experiences.</td>
<td>2</td>
<td>0.88</td>
</tr>
<tr>
<td>35.</td>
<td>I can teach any agricultural education course.</td>
<td>2</td>
<td>0.85</td>
</tr>
<tr>
<td>19.</td>
<td>I feel comfortable with my classroom management skills</td>
<td>2</td>
<td>0.84</td>
</tr>
</tbody>
</table>

**Most Unlike Statements**

<table>
<thead>
<tr>
<th>No.</th>
<th>Most Unlike Statements</th>
<th>Array Position</th>
<th>Z score</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.*</td>
<td>It is easy to find curriculum materials to instruct with.</td>
<td>-2</td>
<td>-0.54</td>
</tr>
<tr>
<td>15.</td>
<td>I have enough training to deal with student learning problems.</td>
<td>-2</td>
<td>-0.69</td>
</tr>
<tr>
<td>14.</td>
<td>I understand how children learn and develop.</td>
<td>-2</td>
<td>-0.70</td>
</tr>
<tr>
<td>30.*</td>
<td>I have observed teaching that I will model in the future.</td>
<td>-2</td>
<td>-0.95</td>
</tr>
<tr>
<td>25.</td>
<td>I have observed other teachers techniques to motivate students.</td>
<td>-3</td>
<td>-0.98</td>
</tr>
<tr>
<td>17.</td>
<td>I have observed other teachers deal with student learning problems.</td>
<td>-3</td>
<td>-1.01</td>
</tr>
<tr>
<td>26.</td>
<td>I am able to use prescribed curriculum for instruction.</td>
<td>-3</td>
<td>-1.20</td>
</tr>
<tr>
<td>36.</td>
<td>I have observed other teachers use a variety of materials to build lessons with.</td>
<td>-3</td>
<td>-1.22</td>
</tr>
<tr>
<td>32.*</td>
<td>I can construct lesson plans for only the subjects I am comfortable with.</td>
<td>-4</td>
<td>-2.17</td>
</tr>
<tr>
<td>33.</td>
<td>I feel comfortable teaching only one or two subjects.</td>
<td>-4</td>
<td>-2.25</td>
</tr>
</tbody>
</table>

Note. The table displays the top ten most like me and most unlike me statements. *Denotes a distinguishing statement at an alpha level of p < .05.

In addition, these student teachers perceived they could teach any agricultural education course (35, 0.85)(see Table 2). This was emphasized further with the “most unlike me” placement of the distinguishing statement, “I feel comfortable teaching only one or two subjects” (33, -2.25). Participant 17 supported the view of being able to teach any agricultural education course by writing, “I really feel that I was prepared for [the] content.”

The high confidence of the Self-Assured Teacher was emphasized by other statements as well. The most like me placement of two distinguishing statements, “Teaching is easy for me” (2, 1.26), and “I am relaxed when I teach” (6, 1.06), added to the interpretation of comfort and confidence (see Table 2). Although those
holding this view were comfortable and confident in their own teaching ability, they had not observed teaching that they will model in the future (30, -0.95).

In terms of finding quality curriculum, the Self-Assured Teacher struggled. The distinguishing statement “It is easy to find curriculum materials to instruct with” (34, -0.54) was rejected (see Table 2). And while curriculum was difficult to find, these student teachers did not want to use prescribed curriculum for instruction (26, -1.20) either. Participant 15 wrote, “Good curriculum is the key, not having to go home at night and fill in gaps would be beneficial.” This supported a view that these student teachers wanted quality instructional curriculum. It was noteworthy that they had not observed other teachers use a variety of materials with which to build lessons (36, -1.22), or so they perceived.

The Self-Assured Teachers’ expressions of confidence regarding their ability to teach any agricultural education course was also tied to their confidence in planning instruction. The struggle in locating curriculum materials did not affect their perceived ability for lesson planning. These student teachers perceived their lessons contained meaningful learning experiences (12, 0.88), and they were comfortable with their ability to plan instruction overall (23, 1.37) (see Table 2). They also were confident in their ability to construct lessons across the agricultural education curriculum, as expressed by their rejection of the statement, “I can construct lesson plans for only the subjects I am comfortable with” (32, -2.17). However, based on their individual comments, the student teachers did not seem to plan for many classes. Participant 7 claimed to “use the same lesson plan for both horticultural classes,” and Participant 4 stated his classes were “somewhat cover–all in subject matter . . . all ag[ricultural] subjects [were taught] inside one class so the students get a broad view of ag[riculture].”

Although confident, the Self-Assured Teachers view themselves as unprepared in some areas of teaching. They do not perceive they had enough preparation to deal with student learning problems (15, -0.69) nor did they understand how children learn and develop (14, -0.70) (see Table 2). These student teachers had not observed other teachers model these teaching behaviors. They rejected the statements, “I have observed other teachers deal with student learning problems” (17, -1.01), and “I have observed other teachers techniques to motivate students” (25, -0.98). Further, teaching not only evoked confidence for the Self-Assured Teacher but pleasure and satisfaction as well. A most like me statement included, “I like how teaching makes me feel “(1, 1.15), and a distinguishing statement was, “When I teach, I feel satisfied” (3, 1.58) (see Table 2).

Factor 3: Determined Teacher

This factor array was defined by four of the Q–sorts and accounted for 12% of the variance in the analysis. This group was named the Determined Teacher because of its balance of teaching confidence and hard work. Participants with this view had confidence in their teaching ability but perceived they were still growing as teachers and professionals (4, 1.68; 7, 0.73) (see Table 3). This type of student teacher viewed strongly that teaching was not particularly easy (statement 2, z-score -1.92). In addition to teaching not being easy, these student teachers had experienced stress and tension in relation to teaching. Two most unlike me distinguishing statements verified this view firmly: “I am relaxed when I teach” (6, -2.37), and “When I teach, lessons flow” (11, -1.08). Yet, countering the perceived feelings of teaching stress, the Determined Teachers recognized a level of confidence in their ability to teach (5, 2.02). These individuals perceived that they needed less help teaching than before and were growing as a professional (28, 1.34). In addition, teaching was a source of pleasure for this group (1, 1.37). The Determined Teachers’ confidence was supported by others’ thoughts on their teaching ability. This was expressed in the most like me statement, “My students think I teach well” (8, 0.80) (see Table 3).
Table 3

Factor 3: The Determined Teacher View: High and Low Ranking Statements

<table>
<thead>
<tr>
<th>No.</th>
<th>Most Like Statements</th>
<th>Array Position</th>
<th>Z score</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>I am confident in my ability to teach.</td>
<td>4</td>
<td>2.02</td>
</tr>
<tr>
<td>4.</td>
<td>I am getting better at teaching.</td>
<td>4</td>
<td>1.68</td>
</tr>
<tr>
<td>1.</td>
<td>I like how teaching makes me feel.</td>
<td>3</td>
<td>1.37</td>
</tr>
<tr>
<td>28.</td>
<td>I have learned ways to grow as a professional.</td>
<td>3</td>
<td>1.34</td>
</tr>
<tr>
<td>12.</td>
<td>My lessons contain meaningful learning experiences.</td>
<td>3</td>
<td>1.09</td>
</tr>
<tr>
<td>30.*</td>
<td>I have observed teaching that I will model in the future.</td>
<td>3</td>
<td>1.02</td>
</tr>
<tr>
<td>15.</td>
<td>I can teach any agricultural education course.</td>
<td>2</td>
<td>0.84</td>
</tr>
<tr>
<td>23.</td>
<td>I feel comfortable with my ability to plan instruction.</td>
<td>2</td>
<td>0.81</td>
</tr>
<tr>
<td>8.</td>
<td>My students think I teach well.</td>
<td>2</td>
<td>0.80</td>
</tr>
<tr>
<td>7.</td>
<td>I need less help with teaching than I did before.</td>
<td>2</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Most Unlike Statements

<table>
<thead>
<tr>
<th>No.</th>
<th>Most Unlike Statements</th>
<th>Array Position</th>
<th>Z score</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.</td>
<td>I have observed other teachers’ classroom management procedures.</td>
<td>-2</td>
<td>-0.67</td>
</tr>
<tr>
<td>24.*</td>
<td>I feel comfortable with my ability to motivate students.</td>
<td>-2</td>
<td>-0.71</td>
</tr>
<tr>
<td>20.</td>
<td>I know how to encourage positive social interactions.</td>
<td>-2</td>
<td>-0.75</td>
</tr>
<tr>
<td>17.</td>
<td>I have observed other teachers deal with student learning problems.</td>
<td>-2</td>
<td>-0.87</td>
</tr>
<tr>
<td>32.</td>
<td>I can construct lesson plans for only the subjects I am comfortable with.</td>
<td>-3</td>
<td>-0.89</td>
</tr>
<tr>
<td>11.*</td>
<td>When I teach, lessons flow.</td>
<td>-3</td>
<td>-1.08</td>
</tr>
<tr>
<td>34.</td>
<td>It is easy to find curriculum materials to instruct with.</td>
<td>-3</td>
<td>-1.26</td>
</tr>
<tr>
<td>36.</td>
<td>I have observed other teachers use a variety of material to build lessons with.</td>
<td>-3</td>
<td>-1.72</td>
</tr>
<tr>
<td>2.*</td>
<td>Teaching is easy for me.</td>
<td>-4</td>
<td>-1.92</td>
</tr>
<tr>
<td>6.*</td>
<td>I am relaxed when I teach.</td>
<td>-4</td>
<td>-2.37</td>
</tr>
</tbody>
</table>

Note. The table displays the top ten most like me and most unlike me statements. *Denotes a distinguishing statement at an alpha level of $p < .05$.

Unique to the Determined Teacher view, however, was the distinguishing statement, “I have observed teaching that I will model in the future” (30, 1.02) (see Table 3). This was interesting because of their ranking of other statements, i.e., they had not seen teachers perform several important tasks associated with teaching. They rejected three statements associated with the observation of other teachers: “I have observed other teachers’ classroom management procedures” (22, -0.67); “I have observed other teachers deal with student learning problems” (17, -0.87); and “I have observed other teachers use a variety of materials to build lessons with” (6, -1.72). However, not seeing others teachers complete these tasks did not interfere with the Determined Teachers’ views on completing these tasks for themselves. In terms of curriculum planning and instruction, these student teachers expressed comfort with their ability to plan instruction (23, 0.81) and create lessons with meaningful learning experiences (12, 1.09).

In addition, these student teachers perceived they could teach any agricultural education course (35, 0.84). They also expressed they could construct lesson plans for more than just the subjects with which they were comfortable (32, -0.89). Participant 20 emphasized this by stating, “I feel comfortable with [all] the agriculture subjects.” This participant did mention a lack of comfort with the agricultural communications curriculum, however. And, although these student teachers perceived they could construct lesson plans, finding the actual materials needed for the development of the curriculum was not easy for them. To that end, these student teachers rejected the statement, “It is easy to find curriculum materials to instruct with” (34, -1.26).
Limitations

This study did not attempt to measure the intern’s views on teaching ability but rather explore their views through the employment of Q-methodology. Other methods and measures are recommended to study interns’ views further on their teaching ability (i.e., teacher efficacy) or to identify factors that may contribute to those views. Second, this study was limited to the participants who performed the Q-sort and operated under the assumption that the self-reported data reflected the interns’ actual views.

Discussion and Implications

The student teaching internship is a different experience for individual interns; however, some interns shared similar views allowing natural groupings to form. The three factors produced from this Q-method study represented the three distinct views found in the sample of agricultural education interns studied regarding their perceptions of teaching ability during their student teaching experience. Although this study did not attempt to measure the level of teacher efficacy in terms of high or low, all groups expressed a moderate level of teacher efficacy, as their views on teaching reflected an overall positive and satisfactory experience. However, considering Bandura’s (1986, 1997) four sources of efficacy (i.e., mastery experiences, vicarious experiences, social persuasion and physiological/emotional state), each of the three collective viewpoints may have been derived from different sources of efficacy creating experiences.

In this study, the Emerging Teacher was the only view in which a distinct social dimension emerged. Their high ranking of statements such as comfort in communicating with colleagues and parents, motivating students, encouraging positive interactions, and dealing with classroom discipline and management could be reflective of a form of social persuasion, which contributed to their efficacy. When considering social persuasion, it is easier to gain and maintain a sense of efficacy when significant others profess confidence in a person’s abilities (Bandura, 1997). For an intern, this “significant other” may have been a cooperating teacher, university supervisor, the pupils being instructed, or the pupils’ parents, as indicated by the positive placement of such statements.

The Self-Assured Teacher view had the highest ranking of statements concerned with comfort and confidence in their teaching ability. According to Bandura (1986, 1997), mastery experiences are by far the most influential sources of positive self-efficacy beliefs. Though it is not known what the particular experiences were, the high ranking of those statements indicated these interns had the opportunity to master those tasks, therefore, influencing their view.

Another source of efficacy comes from vicarious experiences (Bandura, 1997). Vicarious experiences attained through the observation of others serve as a modeling effect. Evidence was found that modeling served as a source for one of the views, i.e., only interns holding the Determined Teacher viewpoint observed quality teaching being modeled. This is unfortunate because observation of effective models improves a person’s efficacy at performing similar tasks (Bandura, 1997), especially in regard to teaching (Tschannen-Moran et al., 1998).

Recommendations

A longitudinal study during the entire student teaching internship could offer information on how student teachers differ at various stages of their internship experience. It would be helpful to collect data on the same group of student teachers prior to, during, and after they had finished their student teaching experience at the respective cooperating centers. Collecting data at these intervals would allow a researcher to determine the impact of the student teaching experience on student teachers’ views of efficacy, as well as offer multiple, formative opportunities to assist them in improving on their deficiencies during their internship. Further, following a specific population of student teachers over time might be insightful as well. To date, somewhat conflicting evidence exists regarding whether self-efficacy increases (Hoy & Woolfolk, 1990) or decreases.
(Knobloch & Whittington, 2003) after the student teaching internship. Other differences could also be found as the interns transition into the first year of teaching and thereafter.

Roberts and Dyer (2004) noted that being a secondary agricultural education teacher includes more than classroom teaching. As such, Q-statements should be refined and expanded to capture other teaching activities unique to agricultural education. In particular, Q-statements should be developed to include other aspects of a comprehensive agricultural education program, such as SAE and FFA. Information from such a study could provide insight into student teachers’ views on those activities with regard to mastery experiences (Bandura, 1986, 1997).

This study was also informative by providing feedback to university supervisors about the activities occurring at the cooperating centers. When considering “not like me” statements across all three viewpoints, interns struggled with student learning problems, discipline, and finding curriculum materials. Therefore, attempts should be made to address the student interns’ perceived deficiencies in these areas during the on-site visit with the university supervisor.

Student interns also had a perceived deficiency in observing some important teaching behaviors of their cooperators. From a practitioner’s standpoint, dialogue should begin between the university supervisors and the cooperating teacher in order to provide a more robust set of student teaching experiences for all interns. Cooperators should be informed, systematically, of the expectation of the student teaching experience and reminded of the important role they play as models. They should also be encouraged to capitalize on as many teachable moments with the student intern as they do with their own students.

References


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Perceptions of North Carolina High School Agricultural Educators Regarding Students with Special Needs Participating in Supervised Agricultural Experience and FFA Activities

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North Carolina State University

The purpose of this study was to examine the perceptions of North Carolina high school agricultural educators toward including students with special needs when implementing Supervised Agricultural Experience and participating in FFA activities. The population was all high school agricultural educators in North Carolina with 12 month employment (N = 307). A simple random sample of 172 was selected with a response rate of 45.9%. Participants completed a questionnaire that measured teachers’ perceptions and collected demographic information. Data analysis indicated that teachers had positive perceptions toward including students with special needs when implementing SAE. Teachers perceived that FFA participation was beneficial for students with special needs, but there were more limitations for these students than for other students. Teachers most frequently perceived student ability as a barrier to working with these students in SAE and the FFA.

Keywords: Supervised Agricultural Experience; FFA; Students with Special Needs

Introduction

Historically, Agricultural Education has reached out to both young people and adults who, regardless of their abilities, could benefit from instruction in agriculture (Iverson, 1993). In recent years, the number of Career and Technical Education students identified as students with special needs has increased dramatically (North Carolina Department of Public Instruction, 2007). This trend was evident in North Carolina in 2009 when 42% of high school students enrolled in Agricultural Education in North Carolina were academically disadvantaged and 12.9% were disabled (North Carolina Department of Public Instruction, 2010).

Nationally, 14 percent of students enrolled in public education are served under the Individuals with Disabilities Education Act (IDEA) (United States Department of Education, 2009). The federal regulations that mandate the responsibilities of educators to accommodate students with special needs are part of the Individuals with Disabilities Education Act (IDEA) of 2004. The various disabilities that make a student eligible for services provided for under IDEA are: specific learning disabilities, speech or language impairments, mental retardation, emotional disturbance, multiple disabilities, hearing impairments, orthopedic impairments, visual impairments, and other health impairments (United States Bureau of Labor Statistics, 2009).

The predominant model for organizing instruction in Agricultural Education involves the relationships among three major components: classroom and laboratory
instruction, SAE, and FFA (Phipps & Osborne, 1988). All three components have been shown to be beneficial to students with special needs. Dormody, Seevers, Andreasen, and VanLeeuwen (2006) concluded that emphasis should be placed on including students with special needs in FFA and SAE. In a study conducted by Schwager and White (1994), Oklahoma agriculture teachers determined that SAE was beneficial to students with special needs and these students should be encouraged to have an SAE program. Other studies have reported specific concerns about students with special needs competing in Career Development Events with non–special needs students (Boone, Watts, Boone, & Gartin, 2008). Cooper, Bocksnick, and Frick (2002) reported that FFA involvement assisted students with special needs in overcoming struggles with self–esteem and independence. Nonetheless, the National FFA Organization recognized there is legislation requiring agricultural educators to provide equal opportunities for involvement to all students of Agricultural Education, regardless of any disability (Ploss, Field, & Frick, 1996).

Elbert and Baggett (2003) concluded there was a need for research on students with disabilities in Agricultural Education. Trends have shown the population of students with special needs has increased in Agricultural Education; therefore, teachers must be both willing and prepared to meet their unique demands (Stair, 2009). Examining teachers’ perceptions of working with students who have special needs in FFA and SAE could provide insight into how to help teachers cope with the demands of working with these students. It would also provide insight into what support state and local education agencies should provide to teachers working with students with special needs.

Theoretical Framework

The theoretical framework for this study is based on Ajzen’s theory of planned behavior. Ajzen’s theory states individuals’ attitudes, subjective norms in respect to a behavior, and perceived control over a behavior can predict behavioral intentions with a high degree of accuracy (Ajzen, 1991). In the case of this study, agricultural educators’ attitudes, their subjective norms, and perceived control towards working with students with special needs in an Agricultural Education program could predict their intentions of including these students in SAE and the FFA.

Attitude toward a behavior refers to how favorably or unfavorably an individual evaluates a behavior (Ajzen, 1991). This study was designed to determine agricultural educators’ perceptions of working with students with special needs when participating in SAE and FFA. A teacher’s perception indicates his awareness of a specific attitude toward incorporating these students.

Second, subjective norms are social factors that refer to the social pressure an individual feels to perform a particular behavior (Ajzen, 1991). Regardless of whether agricultural educators are actually recruiting or including students with special needs, it is a professional expectation that they will do so. Teachers are told repeatedly by teacher educators, peers, and administration that it is their job to provide equal
opportunities for all students regardless of ability or background and to include them into their respective curriculum. A negative subjective norm could be the pressure agricultural educators may feel to win awards through SAE and FFA because programs that win awards receive praise and recognition.

The third determinant is perceived control, which refers to the individual’s perception of how easy or difficult performing a specific behavior is based upon past experiences as well as anticipated obstacles or barriers (Ajzen, 1991). If agricultural educators perceive that working with students with special needs in the SAE or FFA is difficult, they may be less likely to recruit or find ways to include these students. Furthermore, if agricultural educators perceive there are barriers to include these students, they may not be motivated to do so.

According to Ajzen, agricultural educators will be more likely to incorporate students with special needs in the FFA and SAE, if they have positive attitudes toward working with these students, encouragement from their peers and administration to include special needs students, and they perceive that working with students with special needs is not impossibly difficult. When predicting an individuals’ intention of performing a behavior, the importance of attitudes, social norms, and perceived behavioral control is expected to vary across behaviors and situations (Ajzen, 1991). There may be some situations where only attitudes have a significant impact on intentions, others where attitudes and perceived behavioral control are sufficient to affect intentions, and still others where all three determinants independently impact intentions (Ajzen, 1991). This study focused on specifically evaluating teachers’ attitudes and perceived behavioral control, with consideration to subjective norms that could impact teachers’ intentions of incorporating students with special needs in SAE and FFA activities.

**Purpose/Objectives**

The purpose of this study was to examine the perceptions North Carolina agricultural educators have related to including students with special needs in SAE and FFA activities. Additionally, this study examined the relationships that existed between agricultural educators’ perceptions and in-service training.

The objectives of this study were as follows:

1. Examine agricultural educators’ perceptions toward working with students with special needs when implementing Supervised Agricultural Experience (SAE).
2. Examine agricultural educators’ perceptions toward working with students with special needs within the FFA organization.
3. Identify perceived barriers that agricultural educators may have regarding working with students with special needs when implementing SAE.
4. Identify perceived barriers that agricultural educators may have regarding working with students with special needs within the FFA organization.
5. Determine the amount of in-service training related to students with special needs completed by agricultural educators.
6. Determine if a relationship existed between hours of in-service training agricultural educators received regarding working with students with special needs and agricultural educators’ perceptions of including students in SAE and FFA activities.

**Methods**

This study utilized descriptive explanatory research. Survey research methods were used to collect information to describe North Carolina agricultural educators’ perceptions and perceived barriers of working with students with special needs in the Agricultural Education program. The population examined in this study was high school Agricultural Education teachers in North Carolina with a 12 month teaching contract during the 2009–2010 school year (N = 307). The sampling frame used was the 2009–2010 North Carolina Agriculture Teachers Directory provided by the North Carolina FFA Association. The Agriculture Teachers Directory is maintained by state Agricultural Education supervisors who communicate with teachers at least on a monthly basis. This directory is updated annually and served as the most exhaustive list of agricultural educators in North Carolina. Agricultural Education teachers
with 10 month (including middle school teachers) or 11 month contracts were not included in the population. Agricultural educators with a 12 month teaching contract constituted the population of the study since they have extended time working with students particularly during summer SAE supervision visits and FFA activities. Additionally, middle school teachers were not included in the study because the concept of SAE is taught to middle school students, but they are not required to have SAE projects.

In survey research, information may be collected from a sample of individuals instead of every member of the population (Fraenkel & Wallen, 2006). A simple random sample of teachers was selected to complete the online survey instrument. The sample was obtained by assigning each agriculture teacher a number and then using an online number generator to randomly select individuals to participate in the study. The sample size was determined using Krejcie and Morgan’s sampling formula (Krejcie & Morgan, 1970). Krejcie and Morgan’s formula was based on a 95% confidence level and a degree of accuracy of .05. Using the sampling formula, 172 teachers were selected to participate in the study from a population of 307 high school agricultural educators on 12 month contracts.

The questionnaire was developed by the researcher with some questions being modeled after the Schwager and White (1994) study on Oklahoma agricultural educators’ perceptions of working with students with special needs and SAE. Questions were formatted using a four-point Likert-type scale, multiple choice, or open-ended response. Content validity was determined by a panel of experts including Agricultural Education professors at two universities.

Reliability of the instrument was determined using the test/re-test method. A pilot study was conducted on 14 (n = 14) agricultural educators with a 10 or 11 month teaching contract in North Carolina. These teachers were not included in the population but share similar characteristics with those who were included in the final sample. An e-mail message was sent to 40 teachers on 10 or 11 month teaching contracts requesting that they complete the questionnaire. The teachers were notified that they would be asked to complete the questionnaire a second time 10 days later. Twenty teachers completed the questionnaire for the first round. Fourteen of the 20 original respondents completed the questionnaire again after the 10 day period. The instrument was then evaluated to determine if there were significant differences between the first and second round of responses. No statistically significant differences were found, so the instrument was determined to be stable over time.

To determine perceptions, teachers were asked to respond to specific statements using a four-point Likert-type scale. Likert scales are often used as an attitudinal scale in educational research (Fraenkel & Wallen, 2006). Four-point scales, such as the one used for this study, are often referred to as Forced-Choice Likert-type scales where respondents are not given the option to choose Undecided or Neutral when responding to specific statements. This compels the respondents to decide whether they tend to agree or disagree on some level with a particular statement. On the four-point scale used for this study, 1 represented Strongly Disagree, 2 represented Disagree, 3 represented Agree, and 4 represented Strongly Agree.

Teachers received a cover letter via e-mail explaining the study and how they were selected to participate. The e-mail message also contained a link to the website for the survey instrument. Teachers completed and submitted the questionnaire online. After the initial e-mail message, three follow up e-mail messages were sent roughly three weeks apart for a 12 week period, encouraging the selected teachers to participate. Dillman (2000) suggested that contacting participants four times is sufficient when conducting e-mail surveys. The researcher was not able to distinguish which teachers gave specific responses.

After the 12 week period, 77 teachers had responded to the survey resulting in a 44.8% response rate. One of the recommended procedures for controlling for non-response error is to compare respondents to non-respondents (Lindner & Wingenbach, 2002). Non-response error was controlled for by contacting 15% (n = 17) of the non-respondents and asking them a selection of questions from
the instrument to determine if there were any differences between respondents and non-respondents. An independent *t*-test was used to determine if any statistical differences existed between the perceptions of respondents and non-respondents. No differences were found so the respondents were considered to be representative of the sample. Even though results from the respondents and non-respondents did not differ, due to a relatively low response rate, the results of this study are limited to the respondents.

Descriptive statistics, including measures of central tendency and variability were used to decide teachers’ perceptions regarding including students with special needs in SAE and FFA activities. Perceived barriers to inclusion of students with special needs in these components of the agricultural education program were described using means, frequencies, and percentages. Relationships between teachers perceptions related to working with students with special needs and hours of in-service were analyzed using Pearson product moment correlation coefficients. Based upon advice from the statistics department at North Carolina State University, mean scores from perception items were treated as interval data for the purpose of data analysis.

### Findings

The majority (64.9%) of the 77 respondents were male. Teachers’ ages ranged from 23 to 63 with a mean age of 39.50 and a standard deviation of 11.07. Years of teaching experience ranged from 2 to 37 years. The mean number of years teaching was 14.52 with a standard deviation of 9.36. The sample number (*n*) for each question is different since not all participants responded to each item.

Objective one was to examine agricultural educators’ perceptions toward working with students with special needs when implementing SAE. Table 1 describes the percentages of teachers that responded accordingly to each statement and a mean score for all the teachers’ responses. Based on the responses, teachers perceived that students with special needs receive similar benefits from SAE as other students with 97.1% agreeing with this statement. Teachers also perceived that SAE is beneficial to students with special needs (*M* = 3.01, *SD* = 0.58). Nearly three-quarters (74.5%) of respondents disagreed that students with special needs should not be required to have an SAE. Teachers believed that students with special needs should conduct an SAE program. However, 58.6% of teachers agreed that students with special needs have a more difficult time conducting a quality SAE project than other students.
Table 1
Perceptions of Teachers Regarding Students with Special Needs Participating in Supervised Agricultural Experience (SAE)

<table>
<thead>
<tr>
<th>Statement</th>
<th>n</th>
<th>% Strongly Disagree</th>
<th>% Disagree</th>
<th>% Agree</th>
<th>% Strongly Agree</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive similar benefits from SAE as other students</td>
<td>69</td>
<td>0.0</td>
<td>2.9</td>
<td>66.7</td>
<td>30.4</td>
<td>3.28</td>
<td>0.51</td>
</tr>
<tr>
<td>SAE helps students with special needs set career goals</td>
<td>69</td>
<td>2.9</td>
<td>10.1</td>
<td>75.4</td>
<td>11.6</td>
<td>3.12</td>
<td>0.58</td>
</tr>
<tr>
<td>SAE enhances the social skills of students with special needs</td>
<td>67</td>
<td>3.0</td>
<td>7.5</td>
<td>74.6</td>
<td>14.9</td>
<td>3.05</td>
<td>0.59</td>
</tr>
<tr>
<td>SAE is beneficial to students with special needs</td>
<td>69</td>
<td>2.9</td>
<td>2.9</td>
<td>73.9</td>
<td>20.3</td>
<td>3.01</td>
<td>0.58</td>
</tr>
<tr>
<td>Conduct projects that are closely related to classroom instruction in agriculture</td>
<td>69</td>
<td>1.4</td>
<td>13.0</td>
<td>78.3</td>
<td>7.2</td>
<td>2.96</td>
<td>0.58</td>
</tr>
<tr>
<td>Have a more difficult time conducting a quality SAE project than other students</td>
<td>70</td>
<td>7.1</td>
<td>34.3</td>
<td>52.9</td>
<td>5.7</td>
<td>2.91</td>
<td>0.71</td>
</tr>
<tr>
<td>Are capable of winning SAE awards</td>
<td>70</td>
<td>1.4</td>
<td>20.0</td>
<td>65.7</td>
<td>12.9</td>
<td>2.90</td>
<td>0.61</td>
</tr>
<tr>
<td>Are capable of keeping good SAE records</td>
<td>69</td>
<td>1.4</td>
<td>24.6</td>
<td>60.9</td>
<td>13.0</td>
<td>2.86</td>
<td>0.65</td>
</tr>
<tr>
<td>Should not be required to have an SAE</td>
<td>70</td>
<td>32.9</td>
<td>41.4</td>
<td>15.7</td>
<td>10.0</td>
<td>2.03</td>
<td>0.95</td>
</tr>
</tbody>
</table>

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

Objective two was to examine agricultural educators’ perceptions toward working with students with special needs within the FFA organization. Table 2 describes the percentage of teachers that responded to each statement and a mean for all the teachers’ responses. Based on the responses, teachers perceived that FFA activities were more beneficial to students with special needs ($M = 3.18$, $SD = 0.45$) and they should be expected to participate in FFA activities ($M = 3.05$, $SD = 0.73$). However, almost two-thirds (64.5%) of teachers perceived that FFA activities were more limited for students with special needs than other students. Respondents were divided on whether students with special needs have more difficulty participating in FFA activities than other students with 47.3% choosing to disagree and 52.7% to agree. More than half of responding teachers (56.7%) perceived that students with special needs can receive accommodations at Career Development Events. Teachers perceived that students with special needs do not frequently win awards through their participation in FFA events ($M = 2.38$, $SD = 0.64$).
Table 2
Perceptions of Teachers Regarding Students with Special Needs Participating in FFA Activities

<table>
<thead>
<tr>
<th>Statement</th>
<th>n</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>%</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive similar benefits from FFA participation as other students</td>
<td>74</td>
<td>0.0</td>
<td>2.7</td>
<td>63.5</td>
<td>33.8</td>
<td>3.31</td>
<td>0.52</td>
</tr>
<tr>
<td>FFA activities enhance the social skills of students with special needs</td>
<td>73</td>
<td>1.4</td>
<td>0.0</td>
<td>74.0</td>
<td>24.7</td>
<td>3.22</td>
<td>0.51</td>
</tr>
<tr>
<td>FFA activities are beneficial to students with special needs</td>
<td>76</td>
<td>0.0</td>
<td>2.6</td>
<td>76.3</td>
<td>21.1</td>
<td>3.18</td>
<td>0.45</td>
</tr>
<tr>
<td>Want to join FFA</td>
<td>74</td>
<td>2.7</td>
<td>8.1</td>
<td>68.9</td>
<td>20.3</td>
<td>3.07</td>
<td>0.63</td>
</tr>
<tr>
<td>Should be expected to participate in FFA activities</td>
<td>75</td>
<td>2.7</td>
<td>16.0</td>
<td>54.7</td>
<td>26.7</td>
<td>3.05</td>
<td>0.73</td>
</tr>
<tr>
<td>FFA activities help students with special needs set fulfilling career goals</td>
<td>75</td>
<td>2.7</td>
<td>14.7</td>
<td>73.3</td>
<td>9.3</td>
<td>2.89</td>
<td>0.58</td>
</tr>
<tr>
<td>FFA activities are more limited for students with special needs than other students</td>
<td>76</td>
<td>9.2</td>
<td>26.3</td>
<td>59.2</td>
<td>5.3</td>
<td>2.61</td>
<td>0.73</td>
</tr>
<tr>
<td>Have more difficulty participating in FFA activities</td>
<td>74</td>
<td>8.1</td>
<td>39.2</td>
<td>43.2</td>
<td>9.5</td>
<td>2.54</td>
<td>0.78</td>
</tr>
<tr>
<td>Cannot receive accommodations at Career Development Events</td>
<td>74</td>
<td>10.8</td>
<td>45.9</td>
<td>29.7</td>
<td>13.5</td>
<td>2.46</td>
<td>0.86</td>
</tr>
<tr>
<td>Frequently win awards with their participation in FFA events</td>
<td>74</td>
<td>5.4</td>
<td>54.1</td>
<td>37.8</td>
<td>2.7</td>
<td>2.38</td>
<td>0.64</td>
</tr>
</tbody>
</table>

*Note.* 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree

Objective three was to identify perceived barriers that agricultural educators may have with regard to working with students with special needs when implementing SAE. Teachers were asked to report their top three barriers out of a list of potential challenges to including students with special needs when conducting SAE. Table 3 summarizes their responses. Respondents identified Opportunities to conduct SAE most frequently as a barrier to working with students with special needs in conducting SAE (n = 43). Student ability was the second most frequently identified barrier (n = 37). Facilities for SAE placement not being adequate to meet students’ needs also seemed to be a concern with these teachers when implementing SAE (n = 29).
Table 3  
**Perceived Barriers to Working With Students with Special Needs When Implementing SAE**

<table>
<thead>
<tr>
<th>Column Heading?</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunities</td>
<td>43</td>
<td>55.8</td>
</tr>
<tr>
<td>Student Ability</td>
<td>37</td>
<td>48.0</td>
</tr>
<tr>
<td>Facilities</td>
<td>29</td>
<td>37.7</td>
</tr>
<tr>
<td>Parental Support</td>
<td>27</td>
<td>35.0</td>
</tr>
<tr>
<td>Time</td>
<td>23</td>
<td>29.8</td>
</tr>
<tr>
<td>Supervision</td>
<td>21</td>
<td>27.2</td>
</tr>
<tr>
<td>Student Behavior</td>
<td>14</td>
<td>18.2</td>
</tr>
<tr>
<td>Paraprofessional Support</td>
<td>11</td>
<td>14.3</td>
</tr>
<tr>
<td>Accommodations</td>
<td>11</td>
<td>14.3</td>
</tr>
</tbody>
</table>

*Note. n = number of respondents that selected the barrier as one of their top 3 barriers. % = percentage of respondents who listed barrier as one of the top 3 barriers.*

Objective four was to identify perceived barriers that agricultural educators may have when working with students with special needs in FFA activities. Teachers were asked to report their top three barriers, from a list of potential barriers, to working with students with special needs in FFA involvement. With no attempt to rank the barriers, Table 4 summarizes teachers’ responses regarding their perceived barriers to working with students with special needs when participating in FFA. Student ability (n = 46) and time (n = 34) were identified the most frequently as barriers to working with these students when participating in FFA activities. Parental support was the third most frequently perceived barrier identified by agricultural educators when working with these students in FFA. Paraprofessional support and facilities where FFA events are held were identified the least frequently.

Table 4  
**Perceived Barriers To Working With Students with Special Needs in FFA**

<table>
<thead>
<tr>
<th>Heading?</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Ability</td>
<td>46</td>
<td>59.7</td>
</tr>
<tr>
<td>Time</td>
<td>34</td>
<td>44.1</td>
</tr>
<tr>
<td>Parental Support</td>
<td>29</td>
<td>37.7</td>
</tr>
<tr>
<td>Supervision</td>
<td>26</td>
<td>33.7</td>
</tr>
<tr>
<td>Accommodations</td>
<td>21</td>
<td>27.3</td>
</tr>
<tr>
<td>Student Behavior</td>
<td>19</td>
<td>24.7</td>
</tr>
<tr>
<td>Facilities</td>
<td>17</td>
<td>22.1</td>
</tr>
<tr>
<td>Paraprofessional Support</td>
<td>16</td>
<td>20.8</td>
</tr>
</tbody>
</table>

*Note. n = number of respondents that selected the barrier as one of their top 3 barriers. % = percentage of respondents who listed barrier as one of the top 3 barriers.*

Objective five was to determine the total hours of in-service training related to students with special needs completed by high school agricultural education teachers. Of the respondents, 88.3% completed in-service of some form related specifically to working with students with special needs. A total of 816 hours of training was completed by respondents. ($M = 12.01, SD = 14.98$).

Objective six was to determine if a relationship existed between hours of in-service training regarding students with special needs and teachers’ perceptions of working with students when implementing SAE and participating in FFA activities. According to
Davis (1971), the relationships between hours of in–service training and teachers’ perceptions of working with students with special needs when implementing SAE were negligible (Table 5).

Table 5
Relationships between Hours of In–service Training and Teachers’ Perceptions of Working With Students with Special Needs when Implementing Supervised Agricultural Experience (SAE)

<table>
<thead>
<tr>
<th>Statement</th>
<th>n</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive similar benefits from SAE as other students</td>
<td>69</td>
<td>0.11</td>
</tr>
<tr>
<td>SAE helps students with special needs set fulfilling career goals</td>
<td>69</td>
<td>-0.12</td>
</tr>
<tr>
<td>SAE enhances the social skills of students with special needs</td>
<td>67</td>
<td>-0.10</td>
</tr>
<tr>
<td>SAE is beneficial to students with special needs</td>
<td>69</td>
<td>-0.07</td>
</tr>
<tr>
<td>Conduct projects that are closely related to classroom instruction in agriculture</td>
<td>69</td>
<td>0.08</td>
</tr>
<tr>
<td>Have a more difficult time conducting a quality SAE project than other students</td>
<td>70</td>
<td>-0.14</td>
</tr>
<tr>
<td>Are capable of winning awards as a result of their SAE</td>
<td>70</td>
<td>0.18</td>
</tr>
<tr>
<td>Are capable of keeping good SAE records</td>
<td>69</td>
<td>0.20</td>
</tr>
<tr>
<td>Should not be required to have an SAE</td>
<td>70</td>
<td>-0.18</td>
</tr>
</tbody>
</table>

According to Davis (1971), a moderate association ($r = -0.42$) existed between hours of in–service and teachers’ perception that FFA activities are more limited for students with special needs than other students (Table 6). Teachers with fewer hours of in–service perceived that FFA activities were more limited for students with special needs than other students. A low positive correlation ($r = .24$) was found between hours of in–service and the perception that students with special needs benefited from FFA activities. Additionally, a low positive correlation ($r = .24$) was found between hours of in–service and the perception that these students received similar benefits from FFA participation as other students. A correlation of $r = .29$ or less indicated a low association between the two variables according to Davis (1971). Hours of in–service appeared to have some influence on teachers’ perceptions of including students with special needs in FFA activities.

Table 6
Relationship between Hours of In–service and Teachers Perceptions of Working With Students with Special Needs when Participating in FFA Activities

<table>
<thead>
<tr>
<th>Statement</th>
<th>n</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receive similar benefits from FFA participation as other students</td>
<td>74</td>
<td>.24</td>
</tr>
<tr>
<td>FFA activities enhance the social skills of students with special needs</td>
<td>73</td>
<td>.17</td>
</tr>
<tr>
<td>FFA activities are beneficial to students with special needs</td>
<td>76</td>
<td>.24</td>
</tr>
<tr>
<td>Want to join FFA</td>
<td>74</td>
<td>.17</td>
</tr>
<tr>
<td>Should be expected to participate in FFA activities</td>
<td>75</td>
<td>.00</td>
</tr>
<tr>
<td>FFA activities help students with special needs set fulfilling career goals</td>
<td>75</td>
<td>-.18</td>
</tr>
<tr>
<td>FFA activities are more limited for students with special needs</td>
<td>76</td>
<td>-.42</td>
</tr>
<tr>
<td>Have more difficulty participating in FFA activities other than students</td>
<td>74</td>
<td>.06</td>
</tr>
<tr>
<td>Cannot receive accommodations at Career Development Events</td>
<td>74</td>
<td>-.11</td>
</tr>
<tr>
<td>Frequently win awards with their participation in FFA events</td>
<td>74</td>
<td>.22</td>
</tr>
</tbody>
</table>
**Conclusions**

Based upon the results of this study, the following conclusions were drawn:

- Agriculture teachers employed on 12 month contracts have positive perceptions toward students with special needs participation in the FFA and SAE components of the agricultural education program. However, their perception of special needs students’ ability to receive recognition for their participation was higher for SAE activities than for FFA activities.

- Teachers in this study identified fewer opportunities for SAE involvement as the major barrier to students with special needs participating in SAE programs, with 55.8% of the teachers listing opportunities for SAE involvement as one of the top three barriers. While student ability was listed as a barrier by 48% of the teachers, ability was not the major concern.

- Teachers in this study perceive student ability to be a greater barrier for students with special needs participating in FFA activities than in SAE component of the program. The additional time required in working with special needs students on FFA activities is also a major concern for many teachers.

- Most teachers have had in-service training on the topic of including students with special needs that may have impacted their perceptions of including students with special needs in FFA and SAE programs. The amount of in-service training had an overall positive relationship regarding the FFA component, but was not evident regarding including students in SAE.

**Implications**

Overall, teachers indicated they perceived SAE programs and FFA involvement as beneficial to students with special needs. They reported that these students with special needs should be encouraged to have SAE projects and should be expected to participate in FFA activities. These perceptions indicated favorable attitudes regarding the impact Agricultural Education could have on students with special needs, which are reflected in similar studies of working with students with special needs in Agricultural Education (Elbert & Baggett, 2003; Ploss, Field, & Frick, 1996; Schwager & White, 1994). Based on Ajzen’s theory of planned behavior, if teachers have positive attitudes they will be more likely to work with or include these students into their programs. These are positive findings in terms of agricultural educators understanding that all students, regardless of ability, should be included in the total Agricultural Education program.

To what degree do agricultural educators intend to include or recruit these students? Incorporating Ajzen’s (1991) theory, if teachers’ perceived control is impacted by their perception that conducting an SAE program for a student with special needs is more difficult than for other students, it could impact their intent to encourage students with special needs to take on these projects regardless of how beneficial they may feel SAE is to the student. The same is true for FFA involvement. Teachers perceived that FFA activities were more limited for students with special needs and yet they perceived these activities would be beneficial for the students. Do the benefits of being involved outweigh the challenges of including these students to the extent that teachers will actively recruit students to join or participate in FFA? Teachers may conclude that activities are more limited for students with special needs because they are unaware that accommodations can be made to support these students’ at FFA competitive events. While over half of teachers reported that accommodations for Career Development Events were available, the other 43.2% of teachers were still unaware that accommodations exist.

Another consideration is whether or not agricultural educators perceive FFA members with special needs can be successful when participating in FFA activities or competitive events. This study did not address agricultural educators’ perceptions of whether these students can be successful in FFA competitive events, but if the perception exists that students with special needs will not help win FFA competitions or
awards could this influence the teacher’s willingness to include them in the opportunity to participate? FFA members win awards through their SAE projects in the form of proficiency awards or through competition in activities such as Career Development Events. Respondents in this study indicated that students with special needs were more likely to win accolades for their SAE projects than through FFA Career Development Events. Completing a proficiency award application is an individual task where the FFA advisor can directly assist the student, whereas a Career Development Event may require a student to work with other students or independently.

Other studies have reported specific concerns about students with special needs competing in Career Development Events with other students (Boone, Watts, Boone & Gartin, 2008). If FFA advisors perceive that accommodations for students with special needs do not exist or that success is not obtainable, they may be less likely to encourage them to participate in these activities and therefore the students do not even have the opportunity to win any awards through FFA involvement.

Based on Ajzen’s (1991) theory, teachers’ perceived control, when overcoming obstacles or barriers to working with students with special needs, may impact their intended behaviors to include them in SAE programs or FFA activities. If teachers perceive that overcoming these obstacles are too difficult or completely out of their control, their willingness to actively include and incorporate these students may be negatively affected. Teachers identified student ability as the top barrier in each of these areas. The most consistent finding was that teachers’ willingness to integrate students is related to the nature and severity of the students’ disability (Soodak, Podell, & Lehman, 1998).

Number of in–service training hours is positively correlated to how teachers perceived working with students with special needs when participating in FFA activities. Teachers who reported more in–service training perceived that FFA opportunities were not as limited for students with special needs. A study by Avramidis, Bayliss, and Burden (2000) emphasized the importance of pre–service and in–service training and the favorable impact on teachers’ attitudes toward working with students with special needs in an educational setting.

**Recommendations for the Profession**

1. State FFA associations, as well as the National FFA Organization, should have a consistent, public policy regarding accommodations for students with special needs who are participating in Career Development Events or who are applying for proficiency awards and they should make teachers aware they exist.

2. Develop in–service training opportunities that specifically address how to modify SAE projects to meet the needs of students with special needs and how teachers can utilize accommodations to better involve students with special needs in the FFA.

3. Pre–service Agricultural Education programs should provide training and practice regarding accommodating students with special needs in FFA and how to provide opportunities for students in SAE. This training could be incorporated in the form of an entire course in the degree program or integrated throughout the agricultural education curriculum.

**Recommendations for Research**

1. Qualitative research should be conducted regarding teachers’ perceptions of working with students with special needs when implementing SAE or participating in FFA activities. This type of research would provide further insight into teachers’ perceptions and address potential factors that may lead to these perceptions.

2. Further research should be conducted to determine if pre–service (teacher education) programs impact agricultural educators’ perceptions of working with students with special needs.

3. Research should be conducted to assess the needs of pre–service teachers regarding working with students with special needs in the total Agricultural Education program. Findings could be utilized to incorporate appropriate training prior to their professional semester.
4. Further research should be conducted to determine how or if the severity of students’ needs or disabilities impact teachers’ perceptions of working with these students in the total Agricultural Education program.

5. Further research should be conducted to determine agricultural educators’ perceptions of success when working with students with special needs in FFA.

6. Research regarding teachers’ perceptions of working with students with special needs should be replicated on a state and national level.

References


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An Assessment of Students’ Perceptions Toward Factors Influencing Supervised Agricultural Experience Participation

Lauren J. Lewis, Director of Agricultural Studies  
John Rayfield, Assistant Professor,  
Lori, L. Moore, Assistant Professor  
Warner University, Texas A&M University

The purpose of this study was to investigate student perceptions toward factors influencing Supervised Agricultural Experience (SAE) participation. This descriptive study was conducted in 120 randomly selected agricultural education programs throughout four purposively selected states representative of the National FFA regions. Within each state the programs randomly selected to participate were from FFA divisions characterized as having urban city–centers with outlying rural/suburban areas. Students in the programs completed a questionnaire assessing perceptions toward factors influencing SAE participation. According to findings of this study, each state had three prominent types of school SAE resources perceived available for student use. Almost all students with a SAE project believed their teacher encouraged every student to have a SAE, and most received SAE help from a teacher monthly. Factors such as agricultural education courses, parental and teacher support and encouragement, resources (money and facilities), and opportunities for awards and recognition did not seem to influence student SAE participation. Students did believe skill development from SAE participation would be beneficial to their future. Contrary to previous research, involvement in community and school activities did not seem to decrease student SAE participation.

Keywords: Supervised agricultural experience (SAE); student perceptions of SAE; factors influencing SAE participation

Introduction–Theoretical Framework

Across the profession, agricultural educators agree Supervised Agricultural Experience (SAE) programs are an integral component of the agricultural education model (Croom, 2008). However, a growing concern over the lack of student participation in SAE has developed among members of the profession. Although new approaches to SAE have been conceived to target the audience of non–traditional agricultural students, a decline in SAE participation seems to be occurring (Croom, 2008). Much research has been conducted to address the theoretical value and perceptions of SAE (Barrick, 1991; Boone, Doerfert, & Elliot, 1987; Camp, Clark, & Fallon, 2000; Case, 1983; Cheek, Arrington, Carter, & Randell, 1994; Dyer & Osborne, 1995, 1996; Dyer & Williams, 1997; Foster, 1986; Moore, 1987; Rayfield & Wilson, 2009; Roberts, 2006; Steele, 1997; Stewart & Birkenholz, 1991; Swortzel, 1996; Whaley & Lucero, 1993; White & Pals, 2004; Wilson & Moore, 2007), but very little data could be found on increasing their implementation. This study sought to assess student perceptions toward factors influencing SAE participation, in order that methods may be cultivated to diminish the decline. According the American Association for Agricultural Education’s National Research Agenda (Doerfert, 2011), this study aligns with priority area four by examining the role of motivation, self–regulation, metacognition, and reflection in
developing meaningful, engaged learning experiences in agricultural education contexts. By understanding student perceptions related to SAE participation, the agricultural education community may be able to improve quality experiential learning opportunities.

Known as the father of agricultural education, Rufus W. Stimson is credited with developing the project method of teaching, establishing the foundational framework for SAE in agricultural education. SAEs have developed since Stimson’s home project method to include present day agribusiness endeavors, agriscience research, agricultural service-learning opportunities, and agricultural placement programs, as well traditional production agriculture (NAAE, 2012). The National FFA Organization (2012) lists the following categories of SAEs: exploratory, experimentation and research, entrepreneurship and ownership, placement, and improvement. A SAE is “a practical application of classroom concepts designed to provide ‘real world’ experiences and develop skills in agriculturally related career areas” (National FFA Organization, 2012, p.3). Since the organization of agricultural clubs and the implementation of the SAE predecessor, Stimson’s home projects, agricultural students have been fulfilling the FFA motto by learning to do through SAE programs.

Most agricultural educators agree that SAE projects should be required of all agricultural students (Croom, 2008). However, many educators differ on the meaning of the word agricultural in SAE. Some educators believe agricultural to only be defined as farming, while others define agricultural as any career connected to food and natural resources. The differing philosophies result in educators considering the qualifications of SAE implementation diversely. It is believed by some that SAE projects may only be conducted outside instructional hours and school grounds. However, Beeman (1967) stated that agricultural education teachers and administrators agree schools should provide resources for use with instruction and SAEs, as school facilities are potentially viable sources of SAE programs (Berkey & Sutphin, 1984). There does not seem to be a definitive definition for SAE (Dyer & Osborne, 1996). Many states, FFA associations, university agricultural education programs, and agricultural educators define SAE differently. Nevertheless, even with these differing delineations, the agricultural education profession agrees that SAE programs are beneficial for students to engage in. In his address to the Harvard Teachers’ Association, Stimson (1915) stated, “we ought to have a different type of education of secondary grade for those who desired direct preparation for life” (p. 474). SAE is this type of education for agricultural students. Knobloch (1999) summarized the benefits of SAEs well in his article for The Agricultural Education Magazine:

Supervised agricultural experiences implemented in agricultural education programs by its true definition of students experiencing agriculture with adult supervision have proven to help students apply knowledge, clarify career choices, solve problems through decision making, develop responsibility, and learn agricultural skills through practical experiences. (p. 16)

Furthermore, student benefits resulting from SAE programs include personal finance, maturation, development of employment skills, and recognition for achievements (Stewart & Birkenholz, 1991).

To help agricultural educators evaluate the success of their program, National Quality Program Standards for Secondary (Grades 9–12) Agricultural Education were established in 2009 through a project funded by The National Council for Agricultural Education. According to the standards identified in the project, agricultural programs are evaluated using ranking scores for a series of quality indicators for each standard. Several standards in the project address the requirement of all students to have a quality SAE program (The National Council for Agricultural Education, 2009). Standard 2: Experiential Learning of the National Quality Program Standards (The National Council for Agricultural Education, 2009) states that “education is enhanced through active participation by all students in a year-round experiential learning program” (p. 25). In
order to meet the criteria for Standard 2, seven quality indicators for SAE participation, recordkeeping, and supervision must receive an exemplary indicator score by an agricultural program. Standard 1: Program Design and Instruction contains the quality indicator that “experiential learning (SAE) and leadership and personal development (FFA) are integrated throughout the instructional program” (p. 6).

Although the value of SAE programs is evident (Croom, 2008) a synthesis of research conducted by Dyer and Williams (1997) on SAE participation reported the following statistics: only 69.2% of students in Louisiana had SAE programs; 43.0% of students in California had no SAE program; less than half the students in Florida agricultural classes had been involved in SAE programs for all four years of high school; and only 58.0% of students were estimated to have SAE programs in North Carolina. Little research can be found to identify the level of SAE participation by students in Indiana, Missouri, and Utah.

While the integrated three–component model of agricultural education (Phipps & Osborne, 1988) depicts equal emphasis on each part, SAE programs appear to be the weakest (Croom, 2008). Less than one–third of agricultural educators in the nation reported 75.0% or higher participation rate in SAE (Wilson & Moore, 2007). Based on this statistic, teachers need help in improving the quality of the SAE component in their program, but this cannot be accomplished if barriers to participation are not identifiable. Many perceptions exist as to why participation has decreased by students enrolled in agricultural education courses. A few of these factors, identified by agricultural educators, include: lack of time, increased number of students in the classroom, complicated record–keeping, limited school and community opportunities, lack of facilities, low student desire, lack of agricultural background, and a lack of knowledge of the newer categories of SAE (Steele, 1997; Wilson & Moore, 2007). In rural schools, Whaley and Lucero (1993) identified the image of production agriculture, transportation, a lack of appropriate facilities and equipment as perceived barriers. These barriers were agreed on by focus group interviews conducted by Retallick (2010) and reported in five categories: “changing demographics and societal attitudes, mechanics and structure of schools, resource availability, the agricultural education system, and image” (p. 64). Unfortunately, none of these perceived factors have data to validate their causation in the growing decline of participation by agricultural students in SAE programs. In addition, no data can be found to determine the barriers to SAE participation from the agricultural students’ perspective.

The theoretical framework for this study is rooted in Ajzen and Madden’s (1986) Theory of Planned Behavior (TPB). According to TPB, a person’s intentions and behaviors are influenced by three determinants: attitude toward the behavior, the subjective norm, and the perceived behavioral control. The attitude a person has toward the behavior is determined by the perception of how favorable or unfavorable the behavior is. Social pressures to perform or not to perform the behavior are taken into consideration by the person, which determines the subjective norm (Ajzen, 1991). Perceived behavioral control is described by Ajzen (1991) as the “sense of self–efficacy or ability to perform the behavior or interest” (p. 118). Ajzen concluded that people will attempt a behavior when they believe they have the ability, means, and opportunities to perform the behavior.

For purposes of this study, researchers operationalized attitudes as student perceptions toward factors influencing SAE participation. Student responses to the influence of a factor on their participation indicated whether they believed the behavior (SAE participation) was considered favorable or unfavorable. A subjective norm was indicated based on literature, as SAE participation is promoted by educators and stakeholders on the state and national levels (Wilson & Moore, 2007). The students’ perceived behavioral control was operationalized by the degree factors influenced SAE participation. This study only sought to identify the students’ attitude (perceptions) toward factors influencing the behavior (SAE participation).
Purpose and Objectives

The purpose of this study was to assess student perceptions toward factors influencing SAE participation. The research objectives of this study were to:

1. Identify the number of student SAE participants.
2. Examine the availability of school resources for student SAE programs.
3. Describe student perceptions on teacher SAE encouragement.
4. Examine the frequency of SAE help from teacher received by students.
5. Describe student level of agreement with factors influencing SAE participation.

Methods and Procedures

To determine the factors students perceived as influential to their participation in SAEs, a study of enrolled agricultural students in 120 secondary agricultural education programs, 30 per state, one state per National FFA region, was conducted. This study was descriptive in nature, in that it attempted “to describe a given state of affairs as fully and carefully as possible” (Frankel & Wallen, 2009, p. 390) and utilized a questionnaire as the method of data collection. One state per National FFA region was purposively chosen based on similar size and structure within the state FFA divisions (districts/areas/regions), for a total of four states. Frankel and Wallen (2009) stated that investigators can use personal judgment to select a sample based on previous knowledge of a population and the specific purpose of the research. Each division per state chosen included an urban city center with agricultural education programs and outlying rural/suburban agricultural education programs based on the U.S. Census. Thirty programs were randomly selected from each state’s purposively chosen division for participation in the study, with a total of 120 agricultural programs contacted. Teachers were asked to administer the questionnaire to students who had completed at least one year of agricultural education instruction registered in their class with the largest enrollment. It is noted that a limitation of this study exists due to the nature of teacher-administered questionnaires. It was assumed that teachers followed the administration instructions provided as outlined to maintain consistency and did not influence student response to create bias.

A researcher–designed instrument was used in this study to assess students’ perceptions toward factors influencing SAE participation. Content and face validity of the instrument were determined by an established panel of ten experts prior to a pilot study. Reliability was determined for each of the instrument constructs from data collected by a pilot study using Cronbach’s Alpha. This coefficient is a general form of the Kuder–Richardson KR20 formula to be used in calculating the reliability of items (Fraenkel & Wallen, 2009) and is the average of the correlation coefficient for each split determined from the split–half reliability method (Field, 2009). Construct one (α = 0.75) of the instrument asked students to identify if they participated in SAE programs by responding yes or no. Construct two (α = 0.85) of the instrument asked questions specifically related to student perceptions of school SAE resource availability, teacher SAE encouragement, and teacher SAE help. Construct three (α = 0.97) of the instrument assessed student level of agreement with several factors influencing SAE participation on a Likert–type scale. Basic demographic information was gathered by the fourth construct (α = 0.71).

For data collection, Dillman, Smyth, and Christian’s (2009) Tailored Design Method was followed. Five points of contact with participants were made and were considered desirable according to the Tailored Design Method: a brief pre–notice letter or e–mail, a questionnaire mailing with a cover letter via paper mail or e–mail delivery, a thank you or reminder letter via paper mail or e–mail delivery, a replacement questionnaire via paper mail, and a final contact via paper mail or e–mail. Teachers were asked to have the students in their largest class who had completed at least one year of agricultural education instruction complete the study questionnaire. A pre–notice was sent through e–mail to the lead teacher or agricultural department head of the 120 randomly selected agricultural education programs.
programs seeking participation. Teachers were asked to respond to the pre–notice e–mail indicating their preferred method of questionnaire delivery via paper or through Qualtrics™, a survey hosting website, and the number of students enrolled in their largest agricultural education course. Only one teacher preferred to administer the questionnaire online to students. The remaining teachers received paper questionnaires in the first packet mailed. If teachers did not indicate the number of students enrolled in their largest class, 25 questionnaires were sent in all packets. The questionnaires were distributed initially four days following the pre–notice email. Ten days later, the first reminder was sent to non–respondents. The programs yet to return completed questionnaires were randomly selected for the following two reminder delivery method groups: e–mail or paper. The first reminder was sent to the non–respondent programs via the delivery method of the group they were selected in. Seven days after the first reminder was sent, a second paper questionnaire packet was sent to the programs that had still not completed the questionnaires. After 10 days, a second reminder was sent to the non–respondent programs using the opposite delivery method from the first reminder. Initial data collection was completed one week from when the second reminder was sent.

Ten days after the initial data collection was completed, non–respondents were contacted through a telephone call to solicit participation in the study. The non–respondents willing to participate in the study received a third packet of questionnaires by mail. Five days after the third questionnaire packet was distributed, a reminder was sent to the non–respondents of the non–respondent group using the opposite reminder delivery method previously for the second reminder. Data collection was completed seven days after the reminder to the non–respondents of the non–respondent group was sent. Only one packet of completed student questionnaires was returned by the non–respondent group.

To address non–response error, it was attempted to compare respondents to non–respondents; however, because less than 20 non–respondent responses were received the statistical power was too low to detect differences between respondents and non–respondents (Lindner, Murphy, & Briers, 2001). Instead, using Method 1 (Lindner, Murphy, & Briers, 2001) to address non–response error, researchers combined all responses and compared early to late respondents. There were no statistically significant differences between the early and late respondents.

At the conclusion of the study, 52 of the 120 randomly selected programs returned questionnaires for a total response rate of 43.3% \( (N = 120, n = 52) \). As a result, 1,038 questionnaires were completed by students in the randomly selected programs of the purposively chosen divisions of the four states selected for this study. Table 1 illustrates the program response rate and number of students who completed the questionnaire per state.

<table>
<thead>
<tr>
<th>Programs Contacted</th>
<th>Programs Responded</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>f</td>
<td>f</td>
<td>f</td>
</tr>
<tr>
<td>Florida</td>
<td>30</td>
<td>19</td>
</tr>
<tr>
<td>Indiana</td>
<td>30</td>
<td>9</td>
</tr>
<tr>
<td>Missouri</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>Utah</td>
<td>30</td>
<td>9</td>
</tr>
<tr>
<td>TOTAL</td>
<td>120</td>
<td>52</td>
</tr>
</tbody>
</table>

Note. Eight programs elected not to participate in the study and were not included in the number of programs responded for each state.

Data analysis was conducted using the Statistical Package for Social Sciences for Windows version 17.0. Descriptive statistics were generated for student SAE participation, school resources perceived available for student SAE program use, and SAE help from teachers.
received by students. Means and standard deviations were calculated for level of agreement by students with factors influencing SAE participation.

**Findings**

At the conclusion of data collection, this study was able to meet the first objective goal by identifying the number of student SAE participants from the programs surveyed in Florida, Indiana, Missouri, and Utah. Based on the total responses from the four states \( (N = 1,027) \), 46.1% \( (n = 473) \) of students reported having SAE programs and 53.9% \( (n = 554) \) reported not having SAE programs. Table 2 shows the breakdown of SAE participation by students surveyed in each state.

Table 2

<table>
<thead>
<tr>
<th>States</th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florida(^a)</td>
<td>137</td>
<td>31.9</td>
<td>292</td>
<td>68.1</td>
</tr>
<tr>
<td>Indiana(^b)</td>
<td>65</td>
<td>40.6</td>
<td>95</td>
<td>59.4</td>
</tr>
<tr>
<td>Missouri(^c)</td>
<td>155</td>
<td>62.0</td>
<td>95</td>
<td>38.0</td>
</tr>
<tr>
<td>Utah(^d)</td>
<td>116</td>
<td>61.7</td>
<td>72</td>
<td>38.3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>473</td>
<td>46.1</td>
<td>554</td>
<td>53.9</td>
</tr>
</tbody>
</table>

Note. Valid percentages are reported; \(^a\)\( n = 429 \). \(^b\)\( n = 160 \). \(^c\)\( n = 250 \). \(^d\)\( n = 188 \).

It was also outlined as important in this study to examine the perceived availability of school resources for student SAE programs. Students were provided operational definitions of the resources listed as identified in literature, and reported the availability of different SAE resources by answering yes or no as to whether they perceived the recourses could be used at their school by students for a SAE program. Table 3 depicts the school resources perceived available for student SAE program use by state. Students enrolled in Florida schools perceived having a higher percentage of on-campus land labs \( (71.7\%, n = 306) \), school farm/project centers \( (72.4\%, n = 305) \), and greenhouses \( (81.9\%, n = 348) \) available for use with their SAE. The most prominent school resource perceived available for student SAE programs use in Indiana \( (77.1\%, n = 121) \) and Missouri \( (88.5\%, n = 224) \) were mechanic/woodworking labs. Greenhouses \( (67.0\%, n = 126) \) and mechanic/woodworking labs \( (93.7\%, n = 174) \) were the school resources perceived most available for student SAE program use in Utah. More than half of the students in each state perceived not having aquaculture tanks available as a resource at their school. Similarly, less than a quarter of students perceived having access to a meat/food science laboratory at their school, except in Indiana \( (48.7\%, n = 75) \). In addition, less than one-fifth of students surveyed in all four states perceived having veterinary technology laboratories available for SAE use at their schools.
Table 3  
**School Resources Perceived Available for Student SAE Program Use (N = 1,038)**

<table>
<thead>
<tr>
<th>School Resources</th>
<th>Florida¹</th>
<th>Indiana²</th>
<th>Missouri³</th>
<th>Utah⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>On–campus land lab</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>306</td>
<td>71.7</td>
<td>50</td>
<td>33.8</td>
</tr>
<tr>
<td>No</td>
<td>121</td>
<td>28.3</td>
<td>98</td>
<td>66.2</td>
</tr>
<tr>
<td>School farm/project center</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>305</td>
<td>72.4</td>
<td>62</td>
<td>40.8</td>
</tr>
<tr>
<td>No</td>
<td>116</td>
<td>27.6</td>
<td>90</td>
<td>59.2</td>
</tr>
<tr>
<td>Greenhouse</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>348</td>
<td>81.9</td>
<td>76</td>
<td>48.7</td>
</tr>
<tr>
<td>No</td>
<td>77</td>
<td>18.1</td>
<td>80</td>
<td>51.3</td>
</tr>
<tr>
<td>Aquaculture tanks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>147</td>
<td>34.8</td>
<td>56</td>
<td>36.6</td>
</tr>
<tr>
<td>No</td>
<td>276</td>
<td>65.2</td>
<td>97</td>
<td>63.4</td>
</tr>
<tr>
<td>Mechanic/woodworking lab</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>256</td>
<td>60.5</td>
<td>121</td>
<td>77.1</td>
</tr>
<tr>
<td>No</td>
<td>167</td>
<td>39.5</td>
<td>36</td>
<td>22.9</td>
</tr>
<tr>
<td>Floral design lab</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>147</td>
<td>34.8</td>
<td>56</td>
<td>36.6</td>
</tr>
<tr>
<td>No</td>
<td>276</td>
<td>65.2</td>
<td>97</td>
<td>63.4</td>
</tr>
<tr>
<td>Meat/food science lab</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>33</td>
<td>7.8</td>
<td>75</td>
<td>48.7</td>
</tr>
<tr>
<td>No</td>
<td>391</td>
<td>92.2</td>
<td>79</td>
<td>51.3</td>
</tr>
<tr>
<td>Veterinary technology lab</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>60</td>
<td>14.1</td>
<td>12</td>
<td>7.9</td>
</tr>
<tr>
<td>No</td>
<td>365</td>
<td>85.9</td>
<td>140</td>
<td>92.1</td>
</tr>
</tbody>
</table>

*Note.* Valid percentages are reported. Frequency and valid percentage reflect usable responses to each item. Tabular data totals may differ from each state’s N due to missing data or non–response to particular items; ¹n = 432. ²n = 162. ³n = 253. ⁴n = 191.

Researchers identified describing student perceptions on teacher SAE encouragement for as the third objective of this study. From the data in Table 4, it appears that in Florida (92.2%, ⁰n = 119), Indiana (95.3%, ⁰n = 61), Missouri (96.7%, ⁰n = 146), and Utah (98.3%, ⁰n = 113) more students with SAE programs believed their teacher encouraged every student to have a SAE than students without SAE programs. Approximately 30.5% or less of students without SAE programs in the four states believed their teacher did not encourage every student to have a SAE.
Lewis, Rayfield, & Moore  An Assessment of…

Table 4  
**Student perceptions on teacher encouragement for every student to have a SAE (N = 921)**

<table>
<thead>
<tr>
<th>States</th>
<th>Teacher Encouragement</th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florida</td>
<td>Students without a SAE(^a)</td>
<td>186</td>
<td>80.5</td>
<td>45</td>
<td>19.5</td>
</tr>
<tr>
<td>Florida</td>
<td>Students with a SAE(^b)</td>
<td>119</td>
<td>92.2</td>
<td>10</td>
<td>7.8</td>
</tr>
<tr>
<td>Indiana</td>
<td>Students without a SAE(^c)</td>
<td>57</td>
<td>69.5</td>
<td>25</td>
<td>30.5</td>
</tr>
<tr>
<td>Indiana</td>
<td>Students with a SAE(^d)</td>
<td>61</td>
<td>95.3</td>
<td>3</td>
<td>4.7</td>
</tr>
<tr>
<td>Missouri</td>
<td>Students without a SAE(^e)</td>
<td>68</td>
<td>81.9</td>
<td>15</td>
<td>18.1</td>
</tr>
<tr>
<td>Missouri</td>
<td>Students with a SAE(^f)</td>
<td>146</td>
<td>96.7</td>
<td>5</td>
<td>3.3</td>
</tr>
<tr>
<td>Utah</td>
<td>Students without a SAE(^g)</td>
<td>59</td>
<td>89.4</td>
<td>7</td>
<td>10.6</td>
</tr>
<tr>
<td>Utah</td>
<td>Students with a SAE(^h)</td>
<td>113</td>
<td>98.3</td>
<td>2</td>
<td>1.7</td>
</tr>
</tbody>
</table>

*Note.* Valid percentages are reported; \(^a\)\(n = 231\). \(^b\)\(n = 129\). \(^c\)\(n = 82\). \(^d\)\(n = 64\). \(^e\)\(n = 83\). \(^f\)\(n = 151\). \(^g\)\(n = 66\). \(^h\)\(n = 115\).

The fourth objective of this study identified by researchers was to examine the frequency of SAE help from teachers received by students. Help was defined as SAE supervision by the teacher. In Indiana (32.3%, \(n = 20\)), Missouri (36.2%, \(n = 51\)), and Utah (38.7%, \(n = 43\)) more students perceived receiving SAE help monthly from their teacher. It appeared in Florida that almost one–third of students perceived SAE help from their teacher was received weekly (32.3%, \(n = 39\)). The results are shown in Table 5.

Table 5  
**SAE Help from Teacher Received by Students (N = 435)**

<table>
<thead>
<tr>
<th>Frequency of help</th>
<th>Florida(^a)</th>
<th>Indiana(^b)</th>
<th>Missouri(^c)</th>
<th>Utah(^d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bi–weekly</td>
<td>23</td>
<td>19.0</td>
<td>6</td>
<td>9.7</td>
</tr>
<tr>
<td>Weekly</td>
<td>39</td>
<td>32.2</td>
<td>10</td>
<td>16.1</td>
</tr>
<tr>
<td>Monthly</td>
<td>24</td>
<td>19.8</td>
<td>20</td>
<td>32.3</td>
</tr>
<tr>
<td>Every 3 Months</td>
<td>4</td>
<td>3.3</td>
<td>2</td>
<td>3.2</td>
</tr>
<tr>
<td>Every 6 Months</td>
<td>3</td>
<td>2.5</td>
<td>2</td>
<td>3.2</td>
</tr>
<tr>
<td>Once a Year</td>
<td>3</td>
<td>2.5</td>
<td>9</td>
<td>14.5</td>
</tr>
<tr>
<td>Only in the Summer</td>
<td>1</td>
<td>0.8</td>
<td>6</td>
<td>9.7</td>
</tr>
<tr>
<td>Never</td>
<td>24</td>
<td>19.8</td>
<td>7</td>
<td>11.3</td>
</tr>
</tbody>
</table>

*Note.* Only students who reported having a SAE responded to this question. Valid percentages are reported; \(^a\)\(n = 121\). \(^b\)\(n = 62\). \(^c\)\(n = 141\). \(^d\)\(n = 111\).

The final objective of this study was to describe student level of agreement on factors influencing SAE participation. Students responded to 12 statements using a Likert–type scale to identify their level of agreement with the factor’s influence on their SAE participation, with 1 indicating *Strongly Disagree* and 5 indicating *Strongly Agree*. As seen in Table 6, students in Florida, Indiana, Missouri, and Utah neither agreed or disagreed that enjoyment in
agricultural education courses, parental and teacher support and encouragement, availability of resources (money or facilities), and the opportunity for awards and recognition made them more willing to participate in SAE programs. Missouri ($M = 4.14, SD = 0.92$) and Utah ($M = 4.12, SD = 0.87$) students agreed that the skills they could develop through a SAE would be beneficial, and only Utah ($M = 4.01, SD = 0.96$) students agreed that their parents supported their participation in SAE programs. Students in Florida, Indiana, Missouri, and Utah on average disagreed that involvement in other school and community activities decreased their participation in SAE programs.

Table 6
Level of Agreement by Students with Factors Influencing SAE Participation ($N = 1,038$)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Florida$^a$</th>
<th>Indiana$^b$</th>
<th>Missouri$^c$</th>
<th>Utah$^d$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participating in SAEs makes me enjoy agricultural education courses more.</td>
<td>3.63</td>
<td>1.24</td>
<td>3.52</td>
<td>1.12</td>
</tr>
<tr>
<td>The skills I can develop through a SAE will be beneficial to my future.</td>
<td>3.74</td>
<td>1.13</td>
<td>3.85</td>
<td>1.10</td>
</tr>
<tr>
<td>My parents support my participation in SAEs.</td>
<td>3.68</td>
<td>1.15</td>
<td>3.48</td>
<td>1.09</td>
</tr>
<tr>
<td>My parents encourage my participation in SAEs.</td>
<td>3.72</td>
<td>2.44</td>
<td>3.46</td>
<td>1.03</td>
</tr>
<tr>
<td>Having enough money to fund a project makes me more willing to participate in SAEs.</td>
<td>3.68</td>
<td>1.15</td>
<td>3.54</td>
<td>1.12</td>
</tr>
<tr>
<td>The more time my teacher can help with my SAE the more willing I am to participate.</td>
<td>3.45</td>
<td>1.10</td>
<td>3.40</td>
<td>0.99</td>
</tr>
<tr>
<td>I am more willing to participate in SAEs if my school has facilities I can use.</td>
<td>3.61</td>
<td>1.11</td>
<td>3.38</td>
<td>1.10</td>
</tr>
<tr>
<td>I am more willing to participate in SAEs if I have the facilities to use at home.</td>
<td>3.48</td>
<td>1.16</td>
<td>3.47</td>
<td>1.16</td>
</tr>
<tr>
<td>Involvement in other school activities decreases my participation in SAEs.</td>
<td>2.80</td>
<td>1.23</td>
<td>2.78</td>
<td>1.07</td>
</tr>
<tr>
<td>Involvement in community activities decreases my participation in SAEs.</td>
<td>2.76</td>
<td>1.18</td>
<td>2.64</td>
<td>1.02</td>
</tr>
<tr>
<td>The opportunity to receive recognition for my SAE encourages my participation.</td>
<td>3.43</td>
<td>1.13</td>
<td>3.61</td>
<td>0.99</td>
</tr>
<tr>
<td>The opportunity to receive awards for my SAE encourages my participation.</td>
<td>3.48</td>
<td>1.17</td>
<td>3.50</td>
<td>1.12</td>
</tr>
</tbody>
</table>

Note. Scale: 1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree or Disagree; 4 = Agree; 5 = Strongly Agree; $^a n = 432$. $^b n = 162$. $^c n = 253$. $^d n = 191$. 

Journal of Agricultural Education 63 Volume 53, Number 4, 2012
Conclusions, Implications, and Recommendations

According to the integrated three-component model of agricultural education, SAE participation is believed to be foundational to a student’s experience. If agricultural education programs are to follow the model, all students should not only be engaged in classroom instruction and agricultural youth organizations, but SAE programs as well (Phipps & Osborne, 1988). The results of this study show that SAE involvement by the students surveyed in Florida, Indiana, Missouri, and Utah does not adequately represent the integrated three–component model. Of the students surveyed in this study from the four states, approximately 46.0% reported having SAE programs. These numbers support prior research that student SAE participation is declining (Croom, 2008).

Earlier research conducted by Steele (1997) and Wilson and Moore (2007) stated that a lack of facilities was identified by agricultural educators as a factor that influenced student SAE participation. Before a relationship can be identified between SAE participation and the availability of resources at school, it was necessary to describe what school resources were perceived available for student SAE program use. In Florida greenhouses, on-campus land labs, and a school farm/project center were most available for SAE use by students surveyed. Students surveyed in Indiana reported mechanic/woodworking labs, greenhouses, and meat/food science labs to be the most common resources perceived available for use in their schools. Mechanic/woodworking labs, greenhouses, and on-campus land labs were the most prevalent resources perceived available for SAE use by students surveyed in Missouri. In Utah, students perceived availability of mechanic/woodworking labs, greenhouses, and floral design labs for SAE use at school. Overall, it appeared that in all four states, the perceived availability of veterinary technology labs and aquaculture tanks at the schools was low according to the students surveyed in this study.

The amount of encouragement a student receives from their teacher to have a SAE was also identified as a factor influencing participation. Thirty percent or less of the students without a SAE project surveyed in the four states believed their teacher did not encourage every student to have a SAE program. It appeared in Florida, Indiana, Missouri, and Utah, almost all students with SAE programs believed their teacher encouraged every student to have a SAE program. Overall it can be concluded that more students with SAE programs believed their teacher encouraged every student to have a SAE than students who did not have SAE programs in Florida, Indiana, Missouri, and Utah. Teacher encouragement to participate in SAE programs did not appear to be consistent among the students.

Students surveyed in Florida, Indiana, Missouri, and Utah who reported having SAE programs were also asked to identify the perceived frequency of SAE help from their teacher they received. In Indiana, Missouri, and Utah, almost one–third of students perceived receiving SAE help monthly. A similar number was perceived by students surveyed in Florida for weekly SAE help; however, almost between 10.8% and 19.8% of the students surveyed perceived they never received SAE help from their teacher. Therefore, the perceived frequency of SAE help from a teacher students received did not seem to be consistent among programs or states.

Many factors are thought by agricultural teachers to influence student SAE participation such as lack of time, lack of facilities at school or home, low student desire, and parental support and encouragement. Recognition, awards, and skill development are other factors thought to be positive influencers for student SAE participation (Stewart & Birkenholz, 1991). The results of this study show that according to the students surveyed in Florida, Indiana, Missouri, and Utah, enjoyment in agricultural education courses, parental and teacher support and encouragement, adequate resources (money or facilities), and opportunities for awards and recognition neither encouraged or discouraged student SAE participation. However, students surveyed in Missouri and Utah did believe the skills they could develop through a SAE program would be beneficial to their future. There was a consensus of disagreement by
students surveyed in the four states that involvement in other school and community activities decreased their participation in SAE programs. This finding is contrary to previous studies in which agricultural teachers felt a lack of time prevented students from participating in SAE programs (Steele 1997; Wilson & Moore, 2007).

Through the lens of Ajzen’s (1991) TPB, these findings suggest that the students’ attitude toward factors influencing SAE participation was relatively neutral. Factors such as enjoyment in agricultural education courses, parental and teacher support and encouragement, adequate resources (money or facilities), and opportunities for awards and recognition did not make SAE participation favorable or unfavorable. While skill development did make the behavior of participating in SAE programs favorable, students did not believe community and school involvement made SAE participation unfavorable either.

A small survey of student SAE participation and perceptions in agricultural education programs was accomplished through this study in Florida, Indiana, Missouri, and Utah. Even though the results reflect the perceptions of students surveyed, several implications can be drawn for discussion.

For agricultural education teachers, it is a hard task to motivate students to participate in SAE programs. Previous findings, based off the perceptions of teachers themselves, would say that the best way to encourage student participation is to provide numerous award and recognition opportunities (Stewart & Birkenholz, 1991). However, according to the students in this study, awards and recognition neither positively nor negatively influenced SAE participation. At the same time, more of the students without SAE programs did not feel their teacher encouraged every student to have a SAE program. Several of the factors agricultural teachers assumed lessened student SAE participation (Retallick, 2010; Steele, 1997; Whaley & Lucero, 1993; Wilson & Moore, 2007) were not influential at all from a student’s perspective according to this study. Educators must be cognizant to avoid stereotypes towards students who do not meet the mold of the typical SAE participant in their program and motivate all students to be involved in agricultural experiences. Students who appear to be heavily involved in additional school and community activities may have the potential to participate in the highest quality SAE programs when given the opportunity. Agricultural educators must begin assessing the specific motivators for individual students.

Although students in this study responded that the availability of resources at school or home neither encouraged or discouraged their SAE participation, the results showing what types of resources are perceived available for SAE use at schools gives us a picture of potential for new opportunities. Approximately three types of school resources for student SAE program use were prominent in each state, while others are selectively seen. Our agricultural education programs must begin offering more diverse resources and facilities at schools, not only for instructional purposes, but also for student SAE use. Anyadoh and Barrick (1990) found that a positive relationship exists between the availability of school facilities and the quality of SAE programs. A diverse set of experiences provided at the school would meet the demand of varied students’ interests and give a setting to house their inquiry into agriculture. It is also important to note that agricultural educators must begin realizing the potential SAE opportunities that surround students while they are in the agricultural classroom. Further utilization of school facilities and resources for student SAE programs could increase participation exponentially.

A factor that may not have been considered before as influential to student SAE participation is the amount of help received from teachers. We can assume from this study that most teachers, on average, provided students with SAE help on a monthly basis. If assistance was provided more, and SAE programs were properly supervised by the teacher, would students without SAE programs be more likely to participate? Some students in the study claim their teacher never provided SAE help. Students might be more apt to participate in SAE programs if they felt they had stronger support and direction from their agricultural teacher throughout the duration of the project. It is noted that there are only 24 hours in a day and a
teacher cannot be expected to be in all places at once. To improve student SAE program supervision, the responsibility can be shared by the teacher with the parents of students and program supporters. Teachers should communicate this need early in a student’s SAE and work with the parents and community to provide adequate supervision and help to ensure a successful program.

To further improve agricultural education programs and the SAE component, we can turn to our teacher educator programs. For teacher educators, this study provides insight into an area that perhaps demands more focus. It is assumed that student teachers will graduate with a comprehensive knowledge of what is required in agricultural education programs. However, if they do not have a grasp on supervising SAE programs, this portion of the integrated three component model will be neglected. Teacher educators should begin to help student teachers see how to integrate SAE into classroom instruction and agricultural youth organization participation more comprehensively by providing more guidance and focus in the area of SAE. Also, ensuring the future teachers understand and recognize their role as a supervisor will improve the students’ experiences. To accomplish this, teacher educators can incorporate more shadowing experiences related to SAE earlier in the teacher preparation coursework and require SAE visit completion during clinical experiences.

Results of the study open the door to several research opportunities in SAE. Not only should this study be replicated in other states to provide a more holistic picture, but additional exploration should also be conducted to address the differences in perceptions between students and teachers related to SAE. It would also be intriguing to discover how agricultural education students are motivated to participate in SAE programs. What motivators are the most influential? The identification of influential SAE participation factors by students would provide a larger perspective on barriers. Recommendations for future research also include defining what constitutes proper and adequate supervision of a student’s SAE project by an agricultural educator. The identification of which types of school SAE resources lend themselves to higher student SAE participation would be of much interest to agricultural educators. Relationships between factors influencing students and their SAE participation should be explored to determine the impact of the perceived behavioral control component of Ajzen’s (1991) TPB on intention to perform said behavior.

References


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Supervised Agricultural Experience: An Examination of Student Knowledge and Participation

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The purpose of this study was to investigate student Supervised Agricultural Experience (SAE) knowledge and participation. This descriptive study was conducted in 120 randomly selected agricultural education programs throughout four purposively selected states representative of the National FFA regions. Students completed a questionnaire assessing knowledge of the five SAE categories. According to findings of this study, 46.1% of the students surveyed reported having a SAE program (n = 473). Students on average could only correctly categorize between three and four of the five SAE project scenarios and approximately one-third of the students surveyed in Indiana, Missouri, and Utah could categorize all five. Students appeared to be able to correctly identify the improvement, research and experimentation, and placement SAE categories more frequently. Those surveyed without a SAE program were either not familiar or somewhat familiar with the five SAE categories. The average number of classroom days spent on SAE instruction since enrolled in agricultural education courses varied from nine to 34 and half of the students in three of the states did not receive a grade for their SAE program or record book in agricultural education courses. Students surveyed did not believe they needed more classroom instruction from their teacher about SAEs.

Keywords: Supervised agricultural experience (SAE); experiential learning; student knowledge of SAE, SAE participation

Introduction and Theoretical Framework

Supervised Agricultural Experience (SAE) programs are accepted as an integral component of the agricultural education model throughout secondary agricultural education (Croom, 2008). However, a growing concern over the lack of student SAE participation has developed among members of the profession. Although new approaches to SAE have been conceived to target the audience of non–traditional agricultural students, a decline in SAE participation seems to be occurring (Croom, 2008). Much research has been conducted to address the theoretical value and perceptions of SAE (Barrick, 1991; Boone, Doerfert, & Elliot, 1987; Camp, Clark, & Fallon, 2000; Case, 1983; Cheek, Arrington, Carter, & Randell, 1994; Dyer & Osborne, 1995, 1996; Dyer & Williams, 1997; Foster, 1987; Moore, 1987; Rayfield & Wilson, 2009; Roberts, 2006; Steele, 1997; Stewart & Birkenholz, 1991; Swortzel, 1996; Whaley & Lucero, 1993; White & Pals, 2004; Wilson & Moore, 2007), but very little data could be found on increasing their implementation. This study sought to assess student SAE knowledge and participation, in order that methods may be cultivated to diminish the decline and improve student knowledge. According the American Association for Agricultural Education’s National Research Agenda (Doerfert, 2011), this study aligns with priority area four by examining the role of motivation, self–regulation, metacognition, and reflection in developing meaningful, engaged learning experiences in agricultural education contexts. By understanding the level of student SAE knowledge, the agricultural education
community may be able to develop more high-quality experiential learning opportunities and increase SAE participation.

SAE programs in agricultural education have developed since Stimson’s home project method to include present day agribusiness endeavors, agriscience research, agricultural service–learning opportunities, and, agricultural placement programs, as well traditional production agriculture (NAAE, 2012). The National FFA Organization (2012) lists the following categories of SAEs: exploratory, experimentation and research, entrepreneurship and ownership, placement, and improvement. A SAE is “a practical application of classroom concepts designed to provide ‘real world’ experiences and develop skills in agriculturally related career areas” (National FFA Organization, 2012, p.3). Since the organization of agricultural clubs and the implementation of the SAE predecessor, Stimson’s home projects, agricultural education students have been learning to do through participation in SAE programs.

Conflict has risen over the years, as many educators differ on the meaning of the word agricultural in SAE. Some educators believe agricultural to only be defined as farming, while others define agricultural as any career connected to food and natural resources. The differing philosophies result in educators considering the qualifications of SAE implementation diversely. Nevertheless, most agricultural educators agree that SAE programs should be required of all agricultural students (Croom, 2008). Knobloch (1999) summarized the benefits of SAEs well in his article for The Agricultural Education Magazine:

Supervised agricultural experiences implemented in agricultural education programs by its true definition of students experiencing agriculture with adult supervision have proven to help students apply knowledge, clarify career choices, solve problems through decision making, develop responsibility, and learn agricultural skills through practical experiences. (p. 16)

Furthermore, student benefits resulting from experience programs include personal finance, maturation, development of employment skills, and recognition for achievements (Stewart & Birkenholz, 1991).

To help agricultural educators evaluate the success of their program National Quality Program Standards for Secondary (Grades 9–12) Agricultural Education were established in 2009 through a project funded by The National Council for Agricultural Education. According to the standards identified in the project, agricultural education programs are evaluated using ranking scores for a series of quality indicators for each standard. Several standards in the project address the requirement of all students to have a quality SAE program (The National Council for Agricultural Education, 2009). Standard 2: Experiential Learning of the National Quality Program Standards (The National Council for Agricultural Education, 2009) states that “education is enhanced through active participation by all students in a year–round experiential learning program” (p. 25). In order to meet the criteria for Standard 2, seven quality indicators for SAE participation, recordkeeping, and supervision must receive an exemplary indicator score by an agricultural program. Standard 1: Program Design and Instruction contains the quality indicator that “experiential learning (SAE) and leadership and personal development (FFA) are integrated throughout the instructional program” (p. 6). In 2009, a Delphi study was conducted to identify quality indicators for SAE programs. As a result several indicators arose, including the need for a diversity of SAEs to be promoted, teacher supervision of SAEs, up–to–date SAE records provided by students, SAE assistance provided by instructors, parents, and employers, involvement of goal setting, and student satisfaction with SAEs (Jenkins & Kittel, 2009).

While the integrated three–component model of agricultural education (Phipps & Osborne, 1988) depicts equal emphasis on each part, SAE programs appear to be the weakest (Croom, 2008). Less than one–third of agricultural educators in the nation reported 75.0% or higher participation rate in SAE (Wilson & Moore, 2007). In New York, Penrod, as cited in Steele (1997), reported as few as 30.0% of agricultural education students in the
state had SAE programs in 1982. Based on these statistics, teachers need help in improving the quality of the SAE component of their program, but this cannot be accomplished if barriers to participation are not identifiable. Many perceptions exist as to why participation has decreased by students enrolled in agricultural education courses. A few of these factors, identified by agricultural educators, include: lack of time, increased number of students in the classroom, complicated record-keeping, limited school and community opportunities, lack of facilities, low student desire, lack of agricultural background, and a lack of knowledge of the newer categories of SAE (Steele, 1997; Wilson & Moore, 2007). Unfortunately, none of these perceived factors have data to validate their causation in the growing decline of participation by agricultural students in SAE programs. In addition, no data can be found to determine the barriers to SAE participation from the agricultural students’ perspective.

The theoretical framework for SAE is rooted in experiential learning. One of the first models of experiential learning was developed by John Dewey. In *Experience and Education*, Dewey (1938) asserted that all learning occurs from experience. A cyclical process where subsequent experiences build on past experiences was indicated to show how people learn from experience:

1. observation of surrounding conditions;
2. knowledge of what has happened in similar situations in the past, a knowledge obtained partly by recollection and partly from the information, advice, and warning of those who have had a wider experience; and
3. judgment which puts together what is observed and what is recalled to see what they signify. (Dewey, 1938, p. 69)

Several other experiential learning theories have built upon Dewey’s foundational work, including Kolb’s (1984) Model of the Experiential Learning Process. Kolb considered learning to be a process of “creating knowledge through the transformation of experience” (p. 38). Similarly to Dewey, Kolb described experiential learning through a cyclical model which contains four stages: (a) the concrete experience (CE); (b) reflective observation (RO) on the concrete experience; (c) abstract conceptualization (AC) of the experience; and (d) active experimentation (AE) based on comprehension of the experience (Figure 1). According to Kolb, this learning cycle can begin at any stage and is an on-going process.

![Figure 1. Model of the Experiential Learning Process (Kolb, 1984)](image-url)
Experiential learning in agricultural education adheres to the cyclical process of Kolb’s (1984) model. The cyclical process is demonstrated through experiences students encounter both in and out of the classroom. Students have CE in agricultural education classes by participating in hands–on activities or engagement in learning, which can spark their interests. From here, students move into RO and begin to internalize what they experienced in class by thinking and reflecting on the experience. In the next stage of AC students may begin to develop their own hypotheses and generalizations about the experience from the classroom. Students find ways to apply what was learned in new ways based on their interpretations of concepts presented from the experience. This mode of learning is also called comprehension. Through participation in activities such as FFA career development events and SAE programs, students complete the cycle of Kolb’s model by entering AE and testing the new hypotheses and generalizations created based on their initial agricultural education classroom experience. This study investigated student comprehension of the five SAE categories from classroom instruction based on the AC stage of the Kolb (1984) Experiential Learning Process.

**Purpose and Objectives**

The purpose of this study was to assess student SAE knowledge and participation. The research objectives of this study were to:

1. Identify the number of student SAE participants.
2. Examine student knowledge of SAE categories.
3. Examine non–participating students’ level of familiarity with SAE categories.
4. Explore classroom SAE instruction practices.

**Methods and Procedures**

To assess student SAE knowledge and participation, a study of enrolled agricultural education students in 120 secondary agricultural education programs, 30 per state, one state per National FFA region, was conducted. This study was descriptive in nature, in that it attempted “to describe a given state of affairs as fully and carefully as possible” (Frankel & Wallen, 2009, p. 390) and utilized a questionnaire as the method of data collection. One state per National FFA region was purposively chosen based on similar size and structure within the state FFA divisions (districts/areas/regions), for a total of four states. Frankel and Wallen (2009) state investigators can use personal judgment to select a sample based on previous knowledge of a population and the specific purpose of the research. Each division per state chosen included an urban city center with agricultural education programs and outlying rural/suburban agricultural education programs based on the U.S. Census. Thirty programs were randomly selected from each state’s purposively chosen division to participate in the study, with a total of 120 agricultural education programs contacted. Teacher contact information was verified through state teacher directories, school websites, and/or personal communication before questionnaire packets were distributed. Teachers were asked to administer the questionnaire to students who had completed at least one year of agricultural education instruction registered in their class with the largest enrollment. It is noted that a limitation of this study exists due to the nature of teacher–administered questionnaires. It was assumed that teachers followed the administration instructions provided as outlined to maintain consistency and did not influence student response to create bias. Researchers also assumed that students completing the questionnaire had received SAE instruction because they had completed at least one year of agricultural education instruction.

A researcher–designed instrument was used in this study to assess student SAE knowledge and participation. Content and face validity of the instrument were determined by an established panel of 10 experts prior to a pilot study. Reliability was determined from data collected by a pilot study using Cronbach’s Alpha. This coefficient is a general form of the Kuder–Richardson KR20 formula to be used in
calculating the reliability of items (Fraenkel & Wallen, 2009) and is the average of the correlation coefficient for each split determined from the split-half reliability method (Field, 2009). The instrument was composed of five constructs and a reliability coefficient was determined for construct one ($\alpha = 0.75$), construct two ($\alpha = 0.95$), construct three ($\alpha = 0.85$), construct four ($\alpha = 0.97$), and construct five ($\alpha = 0.71$). The first construct of the instrument assessed SAE knowledge by asking students to correctly identify the five SAE categories based on a described project scenario provided. Construct two asked students to identify their participation in SAE programs by responding yes or no. Construct three of the instrument asked questions specifically related to a participating student’s SAE program and the amount of classroom SAE instruction practices they received since enrolled in agricultural education courses. Students who indicated they did not participate in SAE programs were asked to rate their level of familiarity with the five SAE categories and indicate the amount of classroom SAE instruction practices they received since enrolled in agricultural education courses. Construct four assessed students’ level of agreement with factors influencing SAE participation. The fifth construct of the instrument gathered basic demographic information about the students.

For data collection, Dillman, Smyth, and Christian’s (2009) Tailored Design Method was followed. Five points of contact with participants were made and were considered desirable according to the Tailored Design Method: a brief pre-notice letter or e-mail, a questionnaire mailing with a cover letter via paper mail or e-mail delivery, a thank you or reminder letter via paper mail or e-mail delivery, a replacement questionnaire via paper mail, and a final contact via paper mail or e-mail. Teachers were asked to have the students in their largest class who had completed at least one year of agricultural education instruction complete the study questionnaire. A pre-notice was sent through e-mail to the lead teacher or agricultural department head of the 120 randomized agricultural education programs seeking participation. Teachers were asked to respond to the pre-notice e-mail indicating their preferred method of questionnaire delivery via paper or online. Only one teacher preferred to administer the questionnaire online to students. The remaining teachers received paper questionnaires in the first packet mailed. If teachers did not indicate the number of students enrolled in their largest class, 25 questionnaires were sent in all packets. The questionnaires were distributed initially four days following the pre-notice email. Ten days later, the first reminder was sent to non-respondents. The programs yet to return completed questionnaires were randomly selected for the following two reminder delivery method groups: e-mail or paper. The first reminder was sent to the non-respondent programs via the delivery method of the group they were selected in. Seven days after the first reminder was sent, a second paper questionnaire packet was sent to the programs that had still not completed the questionnaires. After 10 days, a second reminder was sent to the non-respondent programs using the opposite delivery method from the first reminder. Initial data collection was completed one week from when the second reminder was sent.

Ten days after the initial data collection was completed, non-respondents were contacted through a telephone call to solicit participation in the study. The non-respondents willing to participate in the study received a third packet of questionnaires by mail. Five days after the third questionnaire packet was distributed, a reminder was sent to the non-respondents of the non-respondent group using the opposite reminder delivery method previously for the second reminder. Data collection was completed seven days after the reminder to the non-respondents of the non-respondent group was sent. One program from the non-respondent group returned a packet of completed student questionnaires.

To address non-response error, it was attempted to compare respondents to non-respondents; however, because less than 20 non-respondent responses were received the statistical power was too low to detect differences between respondents and non-respondents (Lindner, Murphy, & Briers, 2001). Instead, using Method 1 (Lindner, Murphy, & Briers, 2001) to address non-response error, researchers combined all responses and
compared early to late respondents. There were no statistically significant differences between the early and late respondents.

At the conclusion of the study, 52 of the 120 randomly selected programs returned questionnaires for a total response rate of 43.3% ($N = 120, n = 52$). As a result, 1,038 questionnaires were completed by students in the randomly selected programs of the purposively chosen divisions of the four states selected for this study. Table 1 illustrates the program response rate and number of students who completed the questionnaire per state.

Table 1: Program Response and Number of Completed Surveys

<table>
<thead>
<tr>
<th>Programs Contacted</th>
<th>Programs Responded</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florida</td>
<td>30</td>
<td>19</td>
</tr>
<tr>
<td>Indiana</td>
<td>30</td>
<td>9</td>
</tr>
<tr>
<td>Missouri</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>Utah</td>
<td>30</td>
<td>9</td>
</tr>
<tr>
<td>TOTAL</td>
<td>120</td>
<td>52</td>
</tr>
</tbody>
</table>

Note. Eight programs elected not to participate in the study and were not included in the number of programs responded for each state.

Data analysis was conducted using the Statistical Package for Social Sciences for Windows version 17.0. Descriptive statistics were generated for student SAE participation, knowledge, and SAE or record book grade in agricultural education courses. Means and standard deviations were calculated for the SAE knowledge score, level of familiarity with SAE categories, and classroom SAE instruction.

Findings

This descriptive study was able to meet the first objective goal by identifying the number of SAE participants from students surveyed in Florida, Indiana, Missouri, and Utah. From the responses of the four states ($N = 1,027$), 46.1% ($n = 473$) of students reported having a SAE program and 53.9 % ($n = 554$) reported not having a SAE program. The breakdown of SAE participation by each state is displayed in Table 2. Missouri students that were surveyed reported the highest SAE participation (62.0%, $n = 155$). Students surveyed in Utah had the second highest level of SAE participation (61.7%, $n = 116$). Forty–percent or less of students surveyed in Florida (31.9%, $n = 137$) and Indiana (40.6%, $n = 65$) reported having a SAE project.

Table 2: Student SAE Participation by State ($N = 1,027$)

<table>
<thead>
<tr>
<th>SAE Participation</th>
<th>Florida</th>
<th>Indiana</th>
<th>Missouri</th>
<th>Utah</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>137</td>
<td>65</td>
<td>155</td>
<td>116</td>
</tr>
<tr>
<td>No</td>
<td>292</td>
<td>95</td>
<td>95</td>
<td>72</td>
</tr>
</tbody>
</table>

Note. Valid percentages are reported; $^a n = 429$. $^b n = 160$. $^c n = 250$. $^d n = 188$.

Examining student SAE knowledge of the five categories was deemed important by the researchers involved in this study. In order to accomplish this second objective, students were asked to correctly identify the SAE category of five SAE project scenarios. A mean score indicating knowledge of the five SAE categories was calculated for each state, as seen in Table 3. Students could receive a mean score of 0 to 5 depending on the number of correctly
categorized SAE project scenarios. Students surveyed in Utah received the highest mean score ($M = 3.17$), being able to correctly identify between three and four of the five SAE categories on average. Florida students surveyed received the lowest mean score ($M = 1.63$), being able to only correctly identify between one and two of the five SAE categories on average.

Table 3

Mean Score Indicating Knowledge of the Five SAE Categories ($N = 1,038$)

<table>
<thead>
<tr>
<th>States</th>
<th>$M$</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florida$^a$</td>
<td>1.63</td>
<td>1.64</td>
</tr>
<tr>
<td>Indiana$^b$</td>
<td>2.61</td>
<td>1.85</td>
</tr>
<tr>
<td>Missouri$^c$</td>
<td>2.89</td>
<td>1.98</td>
</tr>
<tr>
<td>Utah$^d$</td>
<td>3.17</td>
<td>1.76</td>
</tr>
</tbody>
</table>

$^a n = 432$. $^b n = 162$. $^c n = 253$. $^d n = 191$.

Frequencies and percentages were also calculated to determine the total number of correctly identified SAE categories by the students surveyed in each state and are shown in Table 4. More students surveyed in Missouri (38.3%, $n = 97$) and Utah (38.2%, $n = 73$) could identify all five categories of SAE than in Florida (8.3%, $n = 36$) and Indiana (27.8%, $n = 45$).

Table 4

Total Number of Correctly Identified SAE Categories by Students ($N = 1,038$)

<table>
<thead>
<tr>
<th># Correct</th>
<th>Florida$^a$</th>
<th>Indiana$^b$</th>
<th>Missouri$^c$</th>
<th>Utah$^d$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$f$</td>
<td>%</td>
<td>$f$</td>
<td>%</td>
</tr>
<tr>
<td>0</td>
<td>165</td>
<td>38.2</td>
<td>28</td>
<td>17.3</td>
</tr>
<tr>
<td>1</td>
<td>62</td>
<td>14.4</td>
<td>27</td>
<td>16.7</td>
</tr>
<tr>
<td>2</td>
<td>73</td>
<td>16.9</td>
<td>25</td>
<td>15.4</td>
</tr>
<tr>
<td>3</td>
<td>69</td>
<td>16.0</td>
<td>27</td>
<td>16.7</td>
</tr>
<tr>
<td>4</td>
<td>27</td>
<td>6.3</td>
<td>10</td>
<td>6.2</td>
</tr>
<tr>
<td>5</td>
<td>36</td>
<td>8.3</td>
<td>45</td>
<td>27.8</td>
</tr>
</tbody>
</table>

$^a n = 432$. $^b n = 162$. $^c n = 253$. $^d n = 191$.

Additionally, frequencies and percentages were calculated to show how often each SAE category was correctly identified by the students surveyed (Table 5). Students from all four states most commonly were able to correctly identify the improvement, research and experimentation, and placement SAE categories. Overall, students surveyed in Florida appeared to incorrectly identify each of the five categories of SAE more frequently than students from Indiana, Missouri, and Utah. Students surveyed in Utah appeared to display the strongest knowledge of SAE with each category being correctly identified by at least 60.0% of the participants.
Examine non-participating students' level of familiarity with SAE categories was the third objective identified for this study. Students who reported not having a SAE program \((N = 554)\) were asked to rate their level of familiarity with the five SAE categories on a scale of 1 (Not Familiar) to 5 (Very Familiar). Students in Florida, Indiana, Missouri, and Utah reported either being not familiar or somewhat familiar with the five SAE categories (Table 6).

The final objective of this study was to explore classroom SAE instruction practices. Researchers asked students to indicate the number of days their teacher had taught about SAE programs since they had been enrolled in agricultural education courses. It is important to keep in mind when viewing Table 7 that the average number of completed agricultural education courses was two as reported by the students surveyed in each state in a separate section of the questionnaire. The mean number of days students received classroom SAE instruction since they had been enrolled in agricultural education courses varied from nine to 34. Based on the responses of the students surveyed, Missouri provided the most days of classroom SAE instruction \((M = 34.13, SD = 47.08)\). Students surveyed in Florida received the least amount of classroom SAE instruction days \((M = 9.87, SD = 13.99)\).
Table 7
Days of Classroom SAE Instruction Received by Students (N =719)

<table>
<thead>
<tr>
<th>States</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florida</td>
<td>9.87</td>
<td>13.99</td>
</tr>
<tr>
<td>Indiana</td>
<td>13.41</td>
<td>21.69</td>
</tr>
<tr>
<td>Missouri</td>
<td>34.13</td>
<td>47.08</td>
</tr>
<tr>
<td>Utah</td>
<td>11.24</td>
<td>13.53</td>
</tr>
</tbody>
</table>

* n = 257.  b n = 127.  c n = 180.  d n = 155.

Table 8 also helps describe classroom SAE instruction practices by showing the number of students surveyed in each state that reported receiving a grade in their agricultural education course for their SAE program or record book. According to the students surveyed, more students in Missouri (88.3%, n = 204) received a grade for their SAE or record book than in Utah (51.1%, n = 91), Florida (45.1%, n = 156), or Indiana (38.9%, n = 56).

Table 8
SAE or Record Book Included as Part of Grade in Agricultural Courses (N =899)

<table>
<thead>
<tr>
<th>Response</th>
<th>Florida</th>
<th>Indiana</th>
<th>Missouri</th>
<th>Utah</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>Yes</td>
<td>156</td>
<td>45.1</td>
<td>56</td>
<td>38.9</td>
</tr>
<tr>
<td>No</td>
<td>190</td>
<td>54.9</td>
<td>88</td>
<td>61.1</td>
</tr>
</tbody>
</table>

Note. Valid percentages are reported; a n = 346.  b n = 144.  c n = 231.  d n = 178.

Students were additionally asked to rate their level of agreement with a statement pertaining to SAE instruction received using a Likert-type scale with 1 indicating Strongly Disagree and 5 indicating Strongly Agree. The statement asked: “I need more classroom instruction from my teacher about SAEs.” Students surveyed in Missouri (M = 2.66, SD = 1.06), Florida (M = 2.75, SD = 1.13), Indiana (M = 2.89, SD = 1.04), and Utah (M = 2.98, SD = 1.00) on average disagreed with this statement and did not believe they need more classroom instruction from their teacher about SAEs.

Conclusions, Implications, and Recommendations

SAE participation is believed to be a foundational piece of a student’s experience according to the integrated three-component model. If agricultural education programs are to follow the model, all students should not only be engaged in classroom instruction and agricultural youth organizations, but SAE programs as well (Phipps & Osborne, 1988). The results of this study show that SAE involvement by the students surveyed in Florida, Indiana, Missouri, and Utah does not adequately represent the integrated three–component model. Of the students surveyed in this study from the four states, 46.1% reported having SAE program. These numbers support prior research that student SAE participation is declining (Croom, 2008).

Steele (1997), along with Wilson and Moore (2007), identified a lack of knowledge of newer SAE categories as a factor contributing to declining SAE participation. Before a relationship between student SAE knowledge and participation can be determined, it was necessary to initially assess student SAE knowledge. Researchers in this study asked students to identify the categories of SAEs from five different SAE project scenarios described. On average, the students surveyed in Utah could correctly categorize between three and four of the five SAE project scenarios. Indiana and Missouri students surveyed were able to categorize between two and three of the five SAE project scenarios. This number was lower in Florida where the students surveyed on average only correctly categorized between one
and two SAE project scenarios. Approximately one-third of the students surveyed in Indiana, Missouri, and Utah were able to correctly categorize all five SAE project scenarios. However, in Florida, over one-third of the students surveyed could not correctly categorize any of the five SAE project scenarios.

When looking at the categories individually, each SAE category was correctly identified by at least 50.0% of the students surveyed in all states except Florida. Students most commonly were able to correctly identify the improvement, research and experimentation, and placement SAE categories. Non-participating student SAE knowledge was also examined by having the students rate their level of familiarity with the five SAE categories. Overall, students in all four states reported either being not familiar or somewhat familiar with the five SAE categories. This data concerning student SAE knowledge concludes that it is lacking. In addition, this not only confirms previous research that students are not completely familiar with the categories of SAE still considered new, such as exploratory, but that they are not very familiar with all five SAE categories either. Overall, the performance of students demonstrated a stronger SAE knowledge in Missouri and Utah than in Florida and Indiana. However, none of the four states validated above-average knowledge of the five SAE categories.

A potential factor influencing student SAE knowledge is the amount of classroom SAE instruction they receive. The importance of this is emphasized by the National Quality Program Standards for Secondary (Grades 9–12) Agricultural Education which states that SAE should be “integrated throughout the instructional program” (The National Council for Agricultural Education, 2009, p. 6). With students reporting in all four states that they had completed two agricultural education courses on average, the number of classroom instructional days spent on SAE varied from nine to 34. Students surveyed in Florida reported receiving about nine days of classroom SAE instruction, while Missouri students reported receiving about 34 days. The number of days students received SAE instruction in the classroom were somewhat similar in Indiana (13 days) and Utah (11 days). If SAE is to be integrated into the instructional component of a complete agricultural education program, it is thought that a SAE program or record book should be a portion of the student’s grade in agricultural education courses (Talbert, Vaughn, Croom, & Lee, 2007). According to the students surveyed, more students in Missouri appeared to receive a grade for their SAE program or record book than in the other three states. Approximately half of the students in Florida, Indiana, and Utah reported they did not receive a grade in agricultural education courses for their SAE program or record book. It is safe to assume that if more teachers assigned a grade value to SAE programs and record books, more students would be encouraged to participate due to the course requirement.

Students were additionally asked to rate their level of agreement with a statement pertaining to SAE instruction received. Students surveyed in Florida, Indiana, Missouri, and Utah did not believe they needed more classroom instruction from their teacher about SAEs. This would make sense if students had a thorough knowledge of SAE; however, based on the data from this study, they did not and perhaps should receive more classroom SAE instruction from their teacher even if they do not feel it is necessary.

With this study, a snapshot of student SAE knowledge and participation in Florida, Indiana, Missouri, and Utah has been provided. Although the results are not generalizable to all students enrolled in agricultural education, they provide insight into ways to improve student SAE knowledge and participation, as well as the implementation of the SAE component of agricultural education programs.

It is apparent that the students surveyed in this study are not knowledgeable of all five SAE categories. A vital point for teachers to recognize is the necessity of teaching and discussing all five categories of SAEs in their classroom. Many students may not have a SAE program because they lack knowledge and familiarity of the five SAE categories. Teachers should plan to and provide continuous instruction related to SAE throughout the year in each agricultural education course, not just a short unit or only to freshman students.
Instruction needs to be more thoroughly integrated in the curriculum of agricultural education courses. SAE curriculum should consist of content lessons and demonstrations, application of content, and assessment and supervision of student performance. In addition, a discussion of SAE opportunities in all areas of agricultural education would be beneficial to students to help show the connection between class content and the benefits of project-based learning through SAE. There is no current research to determine the adequate number of classroom instructional days devoted to SAE that are needed to increase student knowledge; however, based on Kolb’s (1984) Experiential Learning Process, agricultural educators perhaps need to focus on the AC stage when teaching students about the SAE component of the program. To ensure student comprehension and retention of all aspects of SAE, quality, detailed, and integrated instruction should be provided continuously. An increase in a student’s knowledge and awareness of SAE could positively influence their participation.

Opportunities for exploratory and entrepreneurship SAE programs, along with improvement, research and experimentation, and placement SAE programs should be encouraged and supervised by the teacher for all students. Many students may feel they are unable to participate in a SAE program if they do not mimic the “popular” SAE type of their program. Accomplishing this feat may require the teacher to invest time in professional development which increases their own familiarity with the SAE categories and numerous opportunities. Following the integrated three-component agricultural education model, it makes logical sense to parallel student SAE programs with the degree requirements in the FFA. Students who are earning their Discovery or Greenhand degrees should participate in exploratory and improvement SAE programs. A natural progression in experiences is provided with simultaneous participation in FFA degree programs. While a national organization’s degree requirements should not dictate or limit SAE opportunities, it does provide a starting point for students and teachers.

As Jenkins and Kitchel stated in their 2009 study, several states have SAE program standards and quality indicators established, but more often than not these are self-administered and voluntary. The standards and quality indicators content and format differ drastically from state to state. In this study, Missouri and Utah not only had the highest number of student SAE participants, but also appeared to be more knowledgeable of the SAE categories. It would be advantageous for states to begin collaborating to improve SAE instruction and curriculum across the board. Each state agricultural education program has something valuable to bring to the discussion table; the more we begin to utilize the plethora of SAE knowledge and resources in our own profession across the country, the more we can improve and expand the use of SAE in agricultural education.

The results of this study provide researchers with several opportunities for further SAE research. Not only should this study be replicated in other states, but a qualitative analysis of student SAE knowledge and perceptions would add depth and additional clarity to understanding student SAE participation. Regarding classroom SAE and recordkeeping instruction, what is an effective amount of time teaching should be devoted to SAE and recordkeeping to increase student knowledge and participation? Does a relationship exist between the number of instructional days students receive about SAE and their SAE participation? The implementation of SAE curriculum in an agricultural education course and the change in student SAE knowledge should also be investigated. A synopsis of the methods teachers with high student SAE participation rates use to integrate SAE instruction into the overall curriculum of their agricultural education program would be extremely beneficial for practitioners. A comparison of teacher and student perceptions related to SAE would be interesting to discuss as well.

Researchers should also begin assessing current agricultural educators’ knowledge of SAE opportunities and types, as a lack of teacher familiarity could be a cause for low student SAE participation. A deeper look into innovative practices of teacher educator programs to ensure future agricultural educators are trained in SAE could help identify successful ways to
emphasize SAE for all teacher educator programs. This could be accomplished by incorporating shadowing experiences related to SAE earlier in the teacher preparation coursework or by requiring SAE visit completions during required clinical experiences.

Finally, an analysis of the current SAE categories should be conducted. Are all opportunities for experiential learning in agricultural education reflected in the five SAE categories? Four stages of experiential learning exist in Kolb’s (1984) model; SAE programs often represent the AE or CE stages in the entire agricultural education experience of students. Simultaneously, the experience of having a SAE program in and of itself guides students through all four stages of experiential learning. With current practices in SAE mainly focused on the AE and CE stages of a student’s overall experience in agricultural education, the lack of RO and AC stages may decrease the benefit students can receive from participation, resulting in its decline. Are mechanisms in place for students to conduct SAE programs that are solely a portion of the RO or AC stages in agricultural education? Is it time to expand and redefine SAE to ensure all four stages of learning will occur? Retallick and Martin (2008) posed the question, “Should SAE and FFA continue to be an integral part of secondary agricultural education even though [there is] an indication that it is not occurring in practice” (p. 36)? Assessing the SAE needs of students would give a clearer picture to answer these types of questions. A redefinition of SAE could provide a clearer, more consistent set of expectations for teachers, students, and stakeholders. It would be beneficial for the agricultural education community to continue addressing the concerns surrounding student SAE knowledge and participation.

Although it was not an objective of this study, the results of the data collection procedures are noted. Recent research studies in agricultural education utilize electronic questionnaires to collect data from participants but report low response rates. In this study, the lead agricultural teacher was provided the opportunity to select their most convenient method of questionnaire administration to students, either by paper or electronically. Of the 120 agricultural teachers contacted for participation, only one selected to administer the questionnaire to students electronically. Fifty-one programs completed and returned the paper questionnaire packets. A preference for paper questionnaires versus electronic was obviously displayed by the teachers in this study. Further investigation into identifying successful methods of data collection for agricultural education research could potentially improve response rates to studies conducted.

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Program Evaluation Competencies of Extension Professionals: Implications for Continuing Professional Development

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Nicholas E. Fuhrman, Assistant Professor
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University of Georgia

As states face tough economic times, extension organizations are increasingly emphasizing the importance of evaluation data to show program value. However, little is known about the evaluation skills and abilities of extension professionals expected to collect such data. This knowledge would help inform professional development opportunities designed to target evaluation–related deficiencies. A needs assessment was conducted with Georgia extension professionals to determine the evaluation competencies that provided the greatest opportunity for professional development. Results highlighted competencies within two constructs, analyzing questionnaire data and disseminating evaluation findings, which accounted for seven of the top 10 competencies with the greatest need. The continuing professional development needs of agents varied based on primary program area and experience level, indicating a need for even more targeted continuing professional development. Agents with five or fewer years of experience needed the most professional development in the areas of data collection whereas agents with more experience needed assistance with data analysis and reporting. Continuing professional development to build evaluation competencies in Georgia extension educators should also vary depending on the primary programming responsibilities of the participating extension professional. Although extension professionals with primary responsibilities in Agriculture and Natural Resources needed the most assistance with analyzing questionnaire data, those with primarily 4–H responsibilities needed help disseminating evaluation findings in reports.

Keywords: program evaluation; extension agent professional development; evaluation competencies

Introduction/Literature Review

Decisions about educational program value require impact data. Program evaluation is the process of collecting data to inform such decisions (Rossi, Lipsey, & Freeman, 2004). As state Cooperative Extension units tighten their financial belts to compensate for reductions in funding, determining the value of programs and justifying the use of program resources through evaluation becomes an even more relevant and important practice. Program evaluation also provides data that can inform changes to existing, established programs or justify the development of new programs better targeted to client needs (Boone, Safrit, & Jones, 2002).

Program evaluation is as much a practice as it is a skill, requiring on the job continuing professional development or formal classroom training as part of a degree program. In a study to improve extension–related curriculum, nationally recognized extension experts believed that entry–level extension professionals need to be competent in evaluating programs (Harder, Place, & Scheer, 2010). Others argue that program evaluation competencies should be taught to pre–service nonformal educators during graduate school (Dewey, Montrousse,
Building program evaluation competencies in nonformal educators like 4–H extension agents through professional development opportunities early in their careers has recently become a national top priority (Arnold et al., 2008). Although building evaluation–related skills in extension personnel is a national need, extension educators may lack interest in evaluating their activities and programs (Lekies & Bennett, 2011). As adult learning theory suggests, this lacking interest may be caused by a lack of positive, prior experiences with evaluation or professional development opportunities tied to specific evaluation–related needs (Knowles, Holton, & Swanson, 2005; Merriam, Caffarella, & Baumgartner, 2007). The ability to rigorously collect data on the outcomes (changes in participant knowledge, attitudes, skills, aspirations, and behaviors) and impacts (changes in societal, economic, and environmental conditions) of extension programs has become a skill of increased significance to extension educators in the field and extension specialists at the university. However, before decisions about program value or change can be made using evaluation data, and before professional development opportunities can be targeted to address the specific needs of extension professionals, their ability to collect, analyze, summarize, and make decisions using such data must be determined.

As evaluating the effectiveness of extension programs is critical for program improvement, so too is assessing the evaluation competencies needed by extension professionals. What skills are most necessary for these nonformal educators who evaluate their own programs? Lamm and Israel (2011) suggested that an increased emphasis on evaluation skill development for extension professionals is needed. Numerous resources have been developed to inform state extension specialists, university educators and other program evaluation professional development providers of the most critical competencies for those in agricultural and extension education (Boyd, 2009; Dewey et al., 2008; Russ–Eft, Bober, de la Teja, Foxon, & Koszalka, 2008). For example, 14 core international evaluation standards of practice have recently been published to assist in the development of evaluation–related needs assessments and continuing professional development within organizations such as extension. An extension education community of practice was also recently created by eXtension to assist with building evaluation competencies in extension professionals. Although earlier exploratory studies provided direction toward a taxonomy of essential evaluator competencies (King, Stevahn, Ghere, & Minnema, 2001), translating program evaluation theory into practice for extension professionals who may not be versed in evaluation continues to be a topic of increasing attention (Boyd, 2009; Stevahn, King, Ghere, & Minnema, 2005).

Although the program evaluation needs of extension professionals must first be identified to inform future continuing professional development efforts, identifying such deficiencies can also help determine assets. The theory of planned behavior (Ajzen, 1985) offers promise as a theoretical framework for predicting how assessing needs could also be used to highlight strengths and increase the likelihood of commitment to engage in future professional development activities. According to the theory of planned behavior, aside from organizational requirements, an extension professional’s intent to engage in program evaluation best–practices is a function of his or her: (a) attitudes about data collection, analysis, and reporting, (b) perceptions of social norms about data collection, analysis, and reporting, and (c) perceived ability to collect, analyze, and report data, as illustrated in Figure 1 (Ajzen, 1991). By highlighting current evaluation skills alongside deficiencies during an organizational needs assessment, one can potentially improve attitudes toward evaluation, strengthen data collection and reporting norms, and enhance the perceived ability of extension professionals to engage in program evaluation (Ajzen, 1985).
A comprehensive review of the literature on program evaluation–related competencies was performed by the authors and 48 competencies were found to be most critical. Competencies were grouped into the following seven categories/constructs with the associated number of items/skills comprising each construct in parentheses: program planning (13 skills), stakeholder involvement (4 skills), questionnaire development (8 skills), analyzing questionnaire data (3 skills), focus group development (6 skills), disseminating evaluation findings (10 skills), and applying evaluation findings (4 skills).

**Purpose and Objectives**

The purpose of this study was to determine the program evaluation–related competencies of extension educators in Georgia according to the essential competencies identified in the literature. Borich’s (1980) needs assessment model was used to prioritize the competencies by importance to extension and a professional’s ability to perform each competency.

Specifically, the following objectives guided this study:

1. Describe the importance of and ability to engage in evaluation activities within seven evaluation competency categories as perceived by Georgia extension professionals.
2. Determine the evaluation competency areas that have the greatest need for professional development (high priority areas).
3. Determine whether the high priority evaluation competency areas vary with Extension professionals’ program area and years of experience.

**Methods**

Based on the Borich (1980) needs assessment model, the researchers developed an instrument to assess agents’ perceived levels of importance and ability to perform each of the previously determined 48 program evaluation competencies. A five–point, Likert–type scale
was used, including the following response options for importance and ability items: none, below average, average, above average, and high. An electronic questionnaire was created using SurveyMonkey™ and pilot tested with 4–H agents in Oklahoma following the Tailored Design Method (Dillman, Smyth, & Christian, 2009) before data collection in Georgia. Responses from the Oklahoma pilot study (n = 77) were analyzed for validity and reliability. Nine items made no significant contribution to internal consistency (Cronbach’s alpha) following item analysis and were removed to improve reliability within constructs. All constructs on the pilot instrument were found to have internal consistencies ranging from 0.84 to 0.97.

Following the Oklahoma pilot study, the revised instrument was electronically sent to all extension professionals in Georgia using a census sampling method (N = 249) via SurveyMonkey. Extension personnel were asked to describe themselves based on gender, primary program area, and years of extension experience. The Tailored Design Method was followed (Dillman et al., 2009) and 88 usable responses were received (35% response rate). Early and late respondents were compared and no significant differences were found (Lindner, Murphy, & Briers, 2001). Comparing the demographic data from the achieved sample with the demographic data of Georgia extension professionals in general revealed close similarities, implying generalizability of the sample data to the population of Georgia extension professionals. Although extension administrators were included in the census sample, respondents who selected administration (n = 5) as their primary work area were excluded from data analysis. Descriptive statistics were used to analyze the data using the Statistical Package for the Social Sciences 18.0. Internal consistencies within constructs were determined using Cronbach’s alpha and all constructs were found to have reliabilities ranging from 0.71 to 0.96. The ratio between the number of items and the sample size was too small to allow exploratory factor analysis to identify the final constructs (Costello & Osborne, 2005). Data were also analyzed following the Borich (1980) needs assessment model, and a Mean Weighted Discrepancy Score (MWDS) was calculated for each competency. Mean Weighted Discrepancy Scores were calculated using the formulas in Figure 2.

\[
\text{Discrepancy Score (DS)} = \text{Competency Importance Rating} - \text{Competency Ability Rating}
\]

\[
\text{Weighted DS (WDS)} = \text{DS} \times \text{Mean Competency Importance Rating}
\]

\[
\text{Mean WDS (MWDS)} = \frac{\sum \text{Competency WDS}}{n}
\]

\[
\text{MWDS} = \frac{\sum [(\text{Importance} - \text{Ability}) \cdot M_{\text{Importance}}]}{n}
\]

Figure 2. Formulas used to calculate mean weighted discrepancy scores

The competencies were then ranked by MWDS from largest to smallest. In accordance with the Borich model, a larger MWDS represented a greater disparity between the perceived importance of a competency and the ability of extension professionals to perform that competency. Thus, competencies with larger MWDS’s represented greater professional development needs.

Limitations for this study include the small sample size and resulting inability to perform advanced data reduction techniques such as factor analysis, and its timing. During the time the study was conducted, significant organizational changes were occurring in Georgia which could have affected the response rate. An additional limitation of this study was the limited access to extension professionals in
the pilot study, resulting in the inclusion of only 4–H agents, whereas all program areas were
included in Georgia.

Findings

Sample Demographics.
As shown in Table 1, the majority (63.41%)
of respondents had 10 + years of experience and

Table 1
Primary Program Area and Years of Experience of Georgia Extension Professionals

<table>
<thead>
<tr>
<th>Years of Experience</th>
<th>4–H</th>
<th>FACS</th>
<th>ANR</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f (%)</td>
<td>f (%)</td>
<td>f (%)</td>
<td>f (%)</td>
</tr>
<tr>
<td>5 or less</td>
<td>10 (41.67)</td>
<td>6 (28.57)</td>
<td>8 (21.62)</td>
<td>24 (29.27)</td>
</tr>
<tr>
<td>6 – 9</td>
<td>2 (8.33)</td>
<td>0 (0)</td>
<td>4 (10.81)</td>
<td>6 (7.32)</td>
</tr>
<tr>
<td>10 +</td>
<td>12 (50.00)</td>
<td>15 (71.43)</td>
<td>25 (67.57)</td>
<td>52 (63.41)</td>
</tr>
<tr>
<td>Total</td>
<td>24 (100)</td>
<td>21 (100)</td>
<td>37 (100)</td>
<td>82 (100)</td>
</tr>
</tbody>
</table>

Note: Table total does not equal total non–administrative respondents (n = 83) due to missing
demographic data. FACS = Family and Consumer Sciences, ANR = Agriculture and Natural Resources

Evaluation Competencies by Construct.

Table 2
Evaluation Competencies Grouped by Construct

<table>
<thead>
<tr>
<th>Construct</th>
<th>Imp. M (SD)</th>
<th>Abil. M (SD)</th>
<th>MWDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Planning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selecting the most appropriate needs assessment method</td>
<td>4.19 (0.77)</td>
<td>3.46 (0.72)</td>
<td>2.54</td>
</tr>
<tr>
<td>Identifying how to collect follow up data</td>
<td>3.84 (0.85)</td>
<td>3.06 (0.83)</td>
<td>2.40</td>
</tr>
<tr>
<td>Developing an assessment tool for each learning objective</td>
<td>3.72 (0.93)</td>
<td>2.90 (0.73)</td>
<td>2.38</td>
</tr>
<tr>
<td>Determining the educational needs of clientele</td>
<td>4.34 (0.75)</td>
<td>3.71 (0.71)</td>
<td>2.32</td>
</tr>
<tr>
<td>Determining what to evaluate</td>
<td>4.06 (0.76)</td>
<td>3.40 (0.78)</td>
<td>2.25</td>
</tr>
<tr>
<td>Selecting an assessment tool for each learning objective</td>
<td>3.77 (0.87)</td>
<td>3.04 (0.72)</td>
<td>2.23</td>
</tr>
<tr>
<td>Developing clear learning objectives</td>
<td>4.22 (0.80)</td>
<td>3.64 (0.77)</td>
<td>2.10</td>
</tr>
<tr>
<td>Deciding how often to collect evaluation data</td>
<td>3.80 (0.76)</td>
<td>3.17 (0.71)</td>
<td>1.99</td>
</tr>
<tr>
<td>Determining when to collect evaluation data</td>
<td>3.83 (0.75)</td>
<td>3.28 (0.74)</td>
<td>1.82</td>
</tr>
<tr>
<td>Differentiating between outputs and outcomes</td>
<td>3.69 (0.91)</td>
<td>3.23 (0.80)</td>
<td>1.48</td>
</tr>
<tr>
<td>Obtaining Institutional Review Board (IRB) approval</td>
<td>2.78 (1.28)</td>
<td>2.18 (1.05)</td>
<td>1.31</td>
</tr>
<tr>
<td>Linking the logic model with evaluation plans</td>
<td>3.51 (0.93)</td>
<td>3.12 (0.88)</td>
<td>1.20</td>
</tr>
<tr>
<td>Stakeholders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involving stakeholders in my program planning efforts</td>
<td>4.13 (0.79)</td>
<td>3.48 (0.83)</td>
<td>2.27</td>
</tr>
<tr>
<td>Interacting with program stakeholders</td>
<td>4.36 (0.74)</td>
<td>3.81 (0.82)</td>
<td>2.11</td>
</tr>
<tr>
<td>Determining the stakeholders associated with my program</td>
<td>4.34 (0.72)</td>
<td>3.80 (0.76)</td>
<td>2.06</td>
</tr>
<tr>
<td>Questionnaire Development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Determining appropriate answer choices for each question on a questionnaire</td>
<td>3.90 (0.86)</td>
<td>3.14 (0.70)</td>
<td>2.39</td>
</tr>
</tbody>
</table>
Table 2 (cont.)

Evaluation Competencies Grouped by Construct

<table>
<thead>
<tr>
<th>Questionnaire Development</th>
<th>Mean</th>
<th>SD</th>
<th>MWDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing clear questions for a questionnaire intended for adults</td>
<td>3.96 (0.90)</td>
<td>3.25 (0.79)</td>
<td>2.31</td>
</tr>
<tr>
<td>Writing clear questions for a questionnaire intended for youth less than 12 years old</td>
<td>3.72 (1.11)</td>
<td>2.94 (0.95)</td>
<td>2.30</td>
</tr>
<tr>
<td>Implementing a questionnaire with adults</td>
<td>3.88 (0.88)</td>
<td>3.31 (0.73)</td>
<td>1.88</td>
</tr>
<tr>
<td>Implementing a questionnaire with a youth less than 12</td>
<td>3.63 (1.02)</td>
<td>3.00 (0.91)</td>
<td>1.88</td>
</tr>
<tr>
<td>Designing a questionnaire for use in multiple programs</td>
<td>3.70 (0.93)</td>
<td>3.10 (0.85)</td>
<td>1.87</td>
</tr>
<tr>
<td>Designing a questionnaire for use in a specific program</td>
<td>3.83 (0.87)</td>
<td>3.27 (0.80)</td>
<td>1.85</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analyzing Questionnaire Data</th>
<th>Mean</th>
<th>SD</th>
<th>MWDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making meaning of the questionnaire data I collect</td>
<td>4.05 (1.02)</td>
<td>3.07 (0.85)</td>
<td>3.00</td>
</tr>
<tr>
<td>Analyzing the questionnaire data I collect</td>
<td>3.90 (1.00)</td>
<td>2.98 (0.87)</td>
<td>2.76</td>
</tr>
<tr>
<td>Entering questionnaire data into a spreadsheet for analysis</td>
<td>3.54 (0.98)</td>
<td>2.86 (1.00)</td>
<td>1.96</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Focus Group Development</th>
<th>Mean</th>
<th>SD</th>
<th>MWDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyzing focus group data</td>
<td>3.67 (0.84)</td>
<td>2.82 (0.68)</td>
<td>2.41</td>
</tr>
<tr>
<td>Determining when its most appropriate to use a questionnaire or focus group</td>
<td>3.55 (0.85)</td>
<td>2.71 (0.80)</td>
<td>2.29</td>
</tr>
<tr>
<td>Making meaning of the focus group data I collect</td>
<td>3.70 (0.95)</td>
<td>2.99 (0.89)</td>
<td>2.12</td>
</tr>
<tr>
<td>Developing questions to use in a focus group</td>
<td>3.57 (0.86)</td>
<td>2.90 (0.84)</td>
<td>1.92</td>
</tr>
<tr>
<td>Facilitating a focus group with adults</td>
<td>3.59 (0.84)</td>
<td>3.11 (0.81)</td>
<td>1.50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Disseminating Findings</th>
<th>Mean</th>
<th>SD</th>
<th>MWDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing an impact statement based on questionnaire findings</td>
<td>4.05 (0.96)</td>
<td>3.19 (0.72)</td>
<td>2.73</td>
</tr>
<tr>
<td>Writing about questionnaire findings in an impact statement</td>
<td>3.99 (1.01)</td>
<td>3.16 (0.76)</td>
<td>2.62</td>
</tr>
<tr>
<td>Writing about focus group findings in an impact statement</td>
<td>3.86 (0.91)</td>
<td>2.98 (0.83)</td>
<td>2.62</td>
</tr>
<tr>
<td>Sharing focus group findings so they are understandable to others</td>
<td>3.90 (0.89)</td>
<td>3.06 (0.80)</td>
<td>2.58</td>
</tr>
<tr>
<td>Developing an impact statement based on focus group findings</td>
<td>3.80 (0.96)</td>
<td>2.93 (0.81)</td>
<td>2.54</td>
</tr>
<tr>
<td>Sharing questionnaire findings so they are understandable to others</td>
<td>4.02 (0.90)</td>
<td>3.31 (0.81)</td>
<td>2.36</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Applying Evaluation Findings</th>
<th>Mean</th>
<th>SD</th>
<th>MWDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing a workshop based on evaluation results</td>
<td>3.82 (0.89)</td>
<td>3.00 (0.81)</td>
<td>2.46</td>
</tr>
<tr>
<td>Developing a lesson for adults based on evaluation results</td>
<td>3.93 (0.84)</td>
<td>3.24 (0.73)</td>
<td>2.23</td>
</tr>
<tr>
<td>Developing a lesson for youth based on evaluation results</td>
<td>3.71 (1.12)</td>
<td>2.96 (0.97)</td>
<td>2.21</td>
</tr>
</tbody>
</table>

Note: MWDS= Mean weighted discrepancy score.

Objective 1: Describe the importance of and ability to engage in evaluation activities within seven evaluation competency categories as perceived by Georgia extension professionals.

Table 3 shows the reliabilities and mean summated scale scores for each of the seven evaluation competency constructs. Each construct’s importance mean scale score is larger than the corresponding ability mean scale score, indicating a need for continuing professional development in these areas.
Table 3
Reliabilities and Mean Summated Scale Scores for Evaluation Competency Constructs

<table>
<thead>
<tr>
<th>Construct Name (items)</th>
<th>Importance α</th>
<th>Ability α</th>
<th>Importance M (SD)</th>
<th>Ability M (SD)</th>
<th>Min/Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Planning (12)</td>
<td>0.91</td>
<td>0.91</td>
<td>45.75 (7.38)</td>
<td>38.18 (6.70)</td>
<td>12/60</td>
</tr>
<tr>
<td>Stakeholders (3)</td>
<td>0.90</td>
<td>0.85</td>
<td>12.83 (2.06)</td>
<td>11.08 (2.12)</td>
<td>3/15</td>
</tr>
<tr>
<td>Questionnaire Develop. (7)</td>
<td>0.92</td>
<td>0.88</td>
<td>26.63 (5.37)</td>
<td>22.01 (4.38)</td>
<td>7/35</td>
</tr>
<tr>
<td>Analyzing Quest. Data (3)</td>
<td>0.89</td>
<td>0.78</td>
<td>11.49 (2.72)</td>
<td>8.90 (2.27)</td>
<td>3/15</td>
</tr>
<tr>
<td>Focus Group Develop. (5)</td>
<td>0.94</td>
<td>0.88</td>
<td>18.08 (3.91)</td>
<td>14.53 (3.33)</td>
<td>5/25</td>
</tr>
<tr>
<td>Disseminating Findings (6)</td>
<td>0.96</td>
<td>0.94</td>
<td>23.61 (5.11)</td>
<td>18.63 (4.18)</td>
<td>6/30</td>
</tr>
<tr>
<td>Applying Eval. Findings (3)</td>
<td>0.83</td>
<td>0.71</td>
<td>11.46 (2.47)</td>
<td>9.20 (2.01)</td>
<td>3/15</td>
</tr>
</tbody>
</table>

Objective 2: Determine the evaluation competency areas that have the greatest need for professional development (high priority areas).

Table 4 shows the evaluation competency areas with the greatest need ranked by MWDS. Two constructs, analyzing questionnaire data and disseminating evaluation findings, account for seven of the top 10 competencies, including the six top ranked competencies. Five of the six competencies within the disseminating evaluation findings construct appeared in the top 10, comprising one-half of the competencies with greatest need. Nine of the top 10 competencies with greatest need are related to working with evaluation data once it has been collected. Competencies focused on impact statements and focus groups each ranked in the top 10 four times.

Table 4
Evaluation Competencies Prioritized by Greatest Need

<table>
<thead>
<tr>
<th>Construct</th>
<th>Competency (n = 83)</th>
<th>MWDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AQD</td>
<td>Making meaning of the questionnaire data I collect</td>
<td>3.00</td>
</tr>
<tr>
<td>AQD</td>
<td>Analyzing the questionnaire data I collect</td>
<td>2.76</td>
</tr>
<tr>
<td>DEF</td>
<td>Developing an impact statement based on questionnaire findings</td>
<td>2.73</td>
</tr>
<tr>
<td>DEF</td>
<td>Writing about questionnaire findings in an impact statement</td>
<td>2.62</td>
</tr>
<tr>
<td>DEF</td>
<td>Writing about focus group findings in an impact statement</td>
<td>2.62</td>
</tr>
<tr>
<td>DEF</td>
<td>Sharing focus group findings so they are understandable to others</td>
<td>2.58</td>
</tr>
<tr>
<td>PP</td>
<td>Selecting the most appropriate needs assessment method</td>
<td>2.54</td>
</tr>
<tr>
<td>DEF</td>
<td>Developing an impact statement based on focus group findings</td>
<td>2.54</td>
</tr>
<tr>
<td>AEF</td>
<td>Developing a workshop based on evaluation results</td>
<td>2.46</td>
</tr>
<tr>
<td>FGD</td>
<td>Analyzing focus group data</td>
<td>2.41</td>
</tr>
</tbody>
</table>

Note. MWDS = Mean weighted discrepancy score, AEF = Applying Evaluation Findings, AQD = Analyzing Questionnaire Data, DEF = Disseminating Evaluation Findings, FGD = Focus Group Development, PP = Program Planning

Objective 3: Determine whether the high priority evaluation competency areas vary with Extension professionals’ program area and years of experience.

As seen in Table 5, determining the evaluation competencies with greatest need varies between extension professionals’ primary program area. Agriculture and Natural Resources professionals’ highest MWDS was 3.03 and the two highest need competencies were from the analyzing questionnaire data construct. Family and Consumer Sciences professionals’ highest MWDS was 2.57 and two of the four highest need competencies were from the stakeholders construct. 4–H professionals’ highest MWDS was 4.19 and all three highest need competencies were from the disseminating evaluation findings construct.
Table 5

Evaluation Competencies with Greatest Need by Program Area

<table>
<thead>
<tr>
<th>Construct</th>
<th>Competency</th>
<th>MWDS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agriculture and Natural Resources (n = 37)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AQD</td>
<td>Making meaning of the questionnaire data I collect</td>
<td>3.03</td>
</tr>
<tr>
<td>AQD</td>
<td>Analyzing the questionnaire data I collect</td>
<td>2.74</td>
</tr>
<tr>
<td>PP</td>
<td>Determining the educational needs of clientele</td>
<td>2.58</td>
</tr>
<tr>
<td><strong>Family and Consumer Science (n = 21)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SH</td>
<td>Determining the stakeholders associated with my program</td>
<td>2.57</td>
</tr>
<tr>
<td>FGD</td>
<td>Analyzing focus group data</td>
<td>2.50</td>
</tr>
<tr>
<td>QD</td>
<td>Determining appropriate answer choices for each question on a questionnaire</td>
<td>2.48</td>
</tr>
<tr>
<td>SH</td>
<td>Involving stakeholders in my program planning efforts</td>
<td>2.48</td>
</tr>
<tr>
<td><strong>4–H (n = 24)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEF</td>
<td>Developing an impact statement based on questionnaire findings</td>
<td>4.19</td>
</tr>
<tr>
<td>DEF</td>
<td>Sharing focus group findings so they are understandable to others</td>
<td>3.78</td>
</tr>
<tr>
<td>DEF</td>
<td>Developing an impact statement based on focus group findings</td>
<td>3.77</td>
</tr>
</tbody>
</table>

*Note. MWDS = Mean weighted discrepancy score, AQD = Analyzing Questionnaire Data, DEF = Disseminating Evaluation Findings, FGD = Focus Group Development, PP = Program Planning, SH = Stakeholders, QD = Questionnaire Development*

Table 6 shows the evaluation competencies with the greatest need when extension professionals were grouped by years of experience. The highest MWDS of professionals with five years and less experience was 3.74 and from the disseminating evaluation findings construct. The highest MWDS of professionals with six to nine years of experience was 3.69 and all four competencies with the greatest need were from the program planning and disseminating evaluation findings constructs. The highest MWDS of professionals with 10 or more years of experience was 2.87 and two of the highest need competencies were from the analyzing questionnaire data constructs.
**Table 6**

*Evaluation Competencies with Greatest Need by Years of Extension Experience*

<table>
<thead>
<tr>
<th>Construct</th>
<th>Competency</th>
<th>MWDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five Years and Less</td>
<td>Writing about questionnaire findings in an impact statement</td>
<td>3.74</td>
</tr>
<tr>
<td>(n = 24)</td>
<td>Writing clear questions for a questionnaire intended for youth less than 12 years old</td>
<td>3.66</td>
</tr>
<tr>
<td></td>
<td>Analyzing the questionnaire data I collect</td>
<td>3.65</td>
</tr>
<tr>
<td>Six to Nine Years</td>
<td>Selecting the most appropriate needs assessment method</td>
<td>3.69</td>
</tr>
<tr>
<td>(n = 6)</td>
<td>Determining what to evaluate</td>
<td>3.50</td>
</tr>
<tr>
<td></td>
<td>Writing about focus group findings in an impact statement</td>
<td>3.50</td>
</tr>
<tr>
<td></td>
<td>Developing an impact statement based on focus group findings</td>
<td>3.50</td>
</tr>
<tr>
<td>10 or More Years</td>
<td>Making meaning of the questionnaire data I collect</td>
<td>2.87</td>
</tr>
<tr>
<td>(n = 52)</td>
<td>Developing an impact statement based on questionnaire findings</td>
<td>2.55</td>
</tr>
<tr>
<td></td>
<td>Analyzing the questionnaire data I collect</td>
<td>2.50</td>
</tr>
</tbody>
</table>

*Note.* MWDS = Mean weighted discrepancy score, AQD = Analyzing Questionnaire Data, DEF = Disseminating Evaluation Findings, PP = Program Planning, QD = Questionnaire Development

**Conclusions, Recommendations, and Implications**

After standardizing scores for comparison purposes, the greatest discrepancies in importance and ability means were in the analyzing questionnaire data and disseminating findings constructs (Table 3). These competency categories encompass working with, and making meaning of, evaluation data and using that data to write impact statements and inform stakeholders about program value. The finding that data analysis and dissemination of findings in accountability reports were priority continuing professional development areas supports the work of Dewey et al. (2008) who found that data management and sharing evaluation findings via reports were among the top skills needed in graduates pursuing careers in extension–related fields. Additionally, given recent budget discussions focused on Cooperative Extension and the potential to change the delivery structure of extension in Georgia, it is understandable that extension professionals expressed a need for assistance in disseminating evaluation findings by sharing the outcomes of their programming efforts in accountability reports.

Building the data analysis and dissemination of evaluation findings skills of agents is a top priority for future evaluation–related professional development. One way to build the dissemination skills of agents is through a mentoring program. Serving as a mentor and training new hires in data reporting would likely inspire more seasoned agents to refresh themselves on these skills in the same way a teacher is inspired to review concepts before teaching a lesson. Experienced agents and new hires may even find an avenue to co–author a publication on their evaluation findings.

To assist extension professionals in analyzing questionnaire data, some extension organizations, including Georgia, have promoted the use of online survey systems (e.g., SurveyMonkey™) and digital student response tools such as “clickers.” These methods enable extension professionals to quickly gather quantitative data which are automatically entered into an Excel spreadsheet for analysis (Barker & Killian, 2011; Bird & McClelland, 2010; Conoley, Croom, Moore, & Flowers, 2007). With data collection and data entry automated, extension professionals are free to focus their efforts on calculating descriptive statistics and interpreting the results. Efforts to
build agent capacity in data analysis and interpretation could occur in targeted continuing professional development and with the use of Excel add-ins like EZAnalyze© that perform basic statistical processes (Poynton, 2007).

Extension professionals in this study saw the importance of analyzing and disseminating both quantitative and qualitative evaluation data to communicate the value of extension’s efforts to stakeholders. Overall, they needed the most assistance in disseminating evaluation findings (Table 4). One way to build competencies in disseminating findings is through trainings on impact statement writing where impact statement templates are used. These ready-made templates could include blanks where locally relevant data could be inserted and would save the extension professional time that could be used to analyze and interpret their evaluation data (Boyer et al., 2009). In addition, templates could be written with specific local needs in mind and could come complete with relevance statements detailing how the extension programming efforts address the needs of local clientele. Extension professionals would then only need to provide details on how their evaluation data were collected, what they found, and the implications of their findings for addressing local needs.

In addition to quantitative data gathered from questionnaires, extension professionals need skill development in qualitative data analysis. Most notably, analyzing qualitative data gathered from focus groups emerged as a priority (Table 4). A continuing professional development session specific to qualitative data analysis is necessary for extension professionals in Georgia. This need is currently addressed through the recently developed Master Evaluator Program for Georgia extension professionals (Buckley & Fuhrman, 2011). One of six hour-long online sessions in the Master Evaluator Program focuses solely on qualitative data analysis. Although this session is targeted for agents in a yearly cohort, a session open to all extension professionals would be beneficial. Additional research is needed on the effectiveness of this professional development training program on building evaluation skills in extension professionals.

Continuing professional development to build evaluation competencies in Georgia extension educators should vary depending on the primary programming responsibilities of the participating extension professional. This study found that while extension professionals with primary responsibilities in Agriculture and Natural Resources needed the most assistance with analyzing questionnaire data (AQC), those with primarily 4-H responsibilities needed help with disseminating evaluation findings (DEF) (Table 5). At the time of this study, there was discussion of the 4-H component of Georgia Cooperative Extension being significantly changed. This may have prompted individuals working within 4-H to see the value in sharing the outcomes of their 4-H programming efforts with stakeholders, thus raising the importance scores on items within this construct.

Continuing professional development to strengthen the evaluation competencies of Georgia extension professionals should also be designed with the experience level of the extension participants in mind. Georgia extension professionals with five or fewer years of experience with extension needed more assistance developing questionnaires than did professionals with more extension experience (Table 6). Conversely, individuals with more extension experience expressed a greater need for assistance interpreting questionnaire data and disseminating evaluation findings to stakeholders. Professionals with more experience have perhaps been collecting and using evaluation data for some time and need assistance interpreting and reporting on data they already have, while less experienced individuals need help collecting new information and worry less about what to do with it once in hand. This supports the work of Lamm, Israel, and Harder (2011) who found that extension professionals who valued their own personal use of evaluation data were more likely to conduct in-depth evaluations.

As state budgets limit travel and face-to-face professional development opportunities, utilizing digital technology to implement professional development can be an effective alternative (Koch, Townsend, & Dooley, 2005). In fact, when Georgia extension professionals were asked how they would prefer to receive
professional development information to build program evaluation competencies in this study, the majority (61.4%, \( n = 51 \)) indicated a preference for distance technology either synchronously or asynchronously. These types of professional development opportunities are currently underway through the Master Evaluator Program as extension professionals attend six on–line meetings, successfully complete application–based homework assignments for each session, and then become certified Master Evaluators. Agents with a Master Evaluator certification can then assist other extension professionals with evaluation challenges, much like a mentoring program.

This study provides guidance in answering a recent call for increased evaluation skill development in extension professionals (Lamm & Israel, 2011). Using the data from this study, Georgia extension’s evaluation specialist will specifically target future professional development opportunities to build extension professional skills in analyzing questionnaire data and disseminating evaluation findings with specific consideration for the primary program area and experience level of the professional. With knowledge of the program evaluation competencies of Georgia extension professionals, perhaps other states will examine the evaluation needs of their extension personnel and develop targeted continuing professional development which will reflect the greatest deficiencies. Although decisions about extension program value require data, the ability of extension personnel to collect and analyze such data must first be examined.

References


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Investigating the International Awareness of Students Meeting Their International Dimension Requirement through Course Offerings in a College of Agriculture

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M. Craig Edwards, Professor
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Many U.S. universities are preparing their students to attain international awareness through various approaches. The College of Agricultural Sciences and Natural Resources (CASNR) at Oklahoma State University offers three international dimension undergraduate courses intended to provide students a formal educational opportunity to learn about international issues in agricultural and natural resources contexts. The investigation was a non–experimental, pretest–posttest descriptive and comparative design study. The target population (N = 147) consisted of all undergraduate students enrolled in three international dimension courses during the Fall semester of 2010. The study’s findings revealed that students’ attitudes regarding CASNR’s role in developing their international awareness as well as general awareness of the impact of international issues and globalization on the agriculture sector changed favorably from pre course to post course. These results showed statistically significant differences (p < .05) in students’ attitudes. Comparing students’ attitudes, from pre course to post course, revealed that the international dimension courses studied did impact students’ views related to aspects of enhanced international awareness, including the agriculture sector and their college’s role therein. The attitudes of students who participate in international dimension courses can change positively if U.S. universities internationalize their curricula adequately.

Keywords: attitudes; international awareness; undergraduate curriculum

Introduction

The future of the United States may hinge significantly on its ability to develop citizens who possess an understanding of global issues. “The United States needs many more people who understand how other peoples think, how other cultures work, and how other societies are likely to respond to American action” (Commission on International Education, 1998, p. 7). Therefore, internationalizing or globalizing higher education is viewed by many scholars as a major goal of colleges and universities (e.g., Brooks, Frick, & Bruening, 2006; Irani, Place, & Friedel, 2006). Regarding the agriculture sector alone, “[a]n implication exists that formal education can be used in limited ways to increase students’ international knowledge by making stronger connections with ‘real world’ events and classroom discussions of international agricultural issues” (Wingenbach, Boyd, Lindner, Dick, Arispe, & Haba, 2003, p. 33).

However, Wingenbach et al. (2003) reported that most young adults lack understanding about global or international matters. Irrespective of several decades of global economic dominance by the United States, it is apparent that many of
its university graduates are ill-prepared to meet the challenges of the global labor market (Hunter, 2004). “Not surprisingly, U.S. employers have recognized this shortfall in the U.S. educational system and have spent millions of dollars on intercultural or language training for their employees to help make those employees . . . globally competitive” (Hunter, 2004, p. 6).

Many agricultural producers who had little or no international marketing experience previously are now selling their products to other countries as a result of the enactment of the North American Free Trade Agreement (NAFTA) in 1994 (Wingenbach et al., 2003). If the United States desires to maintain its leadership role in the global economy as well as remain competitive, prosperous, and secure, the country’s institutions of higher education have the crucial obligation to produce graduates who understand international and cross-cultural issues (National Association of Foreign Student Advisers [NAFSA], 2000). Therefore, U.S. institutions of higher education must provide adequate global learning opportunities for students and prepare them to work effectively in the global economy (Grudzinski–Hall, 2007). Institutions may choose to internationalize their curriculum successfully through a multifaceted approach (Navarro & Edwards, 2008).

Many U.S. universities are striving to prepare their students and faculty to attain international awareness through various programs such as study abroad, internationalizing their courses, and fostering international research partnerships (Harder, Wingenbach, & Rosser, 2007; McGowan, 2007; Moriba, 2011). Oklahoma State University (OSU) requires that all undergraduate students complete at least one international dimension course to earn a baccalaureate degree (Oklahoma State University [OSU] Catalog, 2010–2011). The College of Agricultural Sciences and Natural Resources (CASNR) at OSU offers three international dimension undergraduate courses: ANSI 3903 (Agricultural Animals of the World); AGEC 4343 (International Agricultural Markets, Trade and Development); and AGED 4713 (International Programs in Agricultural Education and Extension) (OSU Catalog, 2010–2011).

CASNR, through the three international dimension courses it offers, provides students a formal educational opportunity to learn about international issues in agricultural and natural resources contexts. Embedded in these courses are opportunities to impact students’ understanding of the concept of globalization and its importance in preparing them to make critical career and personal decisions as graduates. However, little or no data were available to ascertain whether students’ enrollment in the international dimension courses increased their international awareness. This study was intended to provide information that would address this need as well as contribute to the body of literature about the international awareness of students who participated in international dimension undergraduate courses in colleges of agriculture.

**Theoretical/Conceptual Framework**

International awareness is understanding and appreciating major global issues such as democracy, governance, conflict, human rights, climate change, the environment, development, education, health, gender, transnational corporations, millennium development goals, poverty, and world hunger (Arias, 2005; Radhakrishna, Leite, & Hill, 2003). When individuals become aware of global issues, they form and maintain a positive attitude in regard to others and appreciate the value of different cultures (Hunter, 2004; Lambert 1996). Hossain, Eley, Gorman, and Coulls (2010) defined attitudes “as the beliefs, feelings and action tendencies of individuals or group of individuals toward objects, ideas, and people” (p. 20).

Providing undergraduate students with appropriate learning experiences may impact positively the attitudes that inform their international awareness. The theory of planned behavior and expectancy–value theory formed the theoretical basis of this study. The theory of planned behavior focuses on how to change the behavior of individuals, which is dependent on predicting deliberate or intended behavior (Ajzen, 1991). Moreover, Ajzen (2006) explained that,
According to the theory of planned behavior, human behavior is guided by three kinds of considerations: beliefs about the likely outcomes of the behavior and the evaluations of these outcomes (behavioral beliefs), beliefs about the normative expectations of others and motivation to comply with these expectations (normative beliefs), and beliefs about the presence of factors that may facilitate or impede performance of the behavior and the perceived power of these factors (control beliefs). (p. 1)

Ajzen (2006) also noted that, “[a]ttitude toward behavior is defined as a person’s overall evaluation of performing the behavior in question” (p. 5). Based on that assumption, this study was supported by the theory of planned behavior because students were expected to form favorable attitudes toward internationalization of the curriculum and globalization of the U.S. higher education system after participating in an international dimension course.

Expectancy–value theory explains and predicts the attitudes of individuals toward certain actions they take. The theory posits that the motivation of learners is influenced by how much value they place on, and their expectation to succeed at, achieving a predetermined goal (Feather, 1992). “According to expectancy–value theory, individuals choose behaviors based on the outcomes they expect and the values they ascribe to those expected outcomes” (Borders, Earleywine, & Huey, 2004, p. 539). Feather (1992) acknowledged that students who place high value and expectancy on their courses will have high motivation to succeed. This study was supported by the expectancy–value theory based on the posit that students will have high value and expectancy on their courses will have high motivation to succeed. This study was supported by the theory of planned behavior because students were expected to form favorable attitudes toward internationalization of the curriculum and globalization of the U.S. higher education system after participating in an international dimension course.

The need for developing agriculture graduates who possess international awareness has become more evident today because globalization has accelerated technological development in agriculture’s production and marketing systems as well as its allied sectors (Malhan & Rao, 2007; United Nations [UN], 2008). As a consequence, graduating agriculture workers who possess more international awareness about agricultural activities around the world has become increasingly important. Moreover, agriculture graduates should have the capacity to function effectively in a world that is becoming more interconnected and interdependent.

Purpose

The purpose of this study was to investigate the international awareness of students enrolled in the international dimension undergraduate courses offered in CASNR at OSU during the Fall semester of 2010. The study described students’ attitudes on international awareness. It also compared students’ attitudes on international awareness, pre course and post course. Further, the study described selected personal characteristics of the students.

Research Questions

1. What were the selected personal characteristics of students enrolled in CASNR undergraduate courses offered for international dimension credit during the Fall semester of 2010?
2. What were students’ pre course and post course attitudes regarding CASNR’s role in impacting their international awareness?
3. What were students’ pre course and post course attitudes regarding their general awareness of the impact of international issues and globalization on the agriculture sector?

Research Hypotheses

H₀ 1 No statistically significant \( (p < .05) \) difference existed between students’ pre course and post course attitudes regarding CASNR’s role in impacting their international awareness after they completed one of CASNR’s international dimension courses (\( H₀: \mu_{1\text{pre course attitudes, CASNR impact}} = \mu_{2\text{post course attitudes, CASNR impact}} \)).

H₀ 2 No statistically significant \( (p < .05) \) difference existed between students’ pre
course and post course attitudes regarding their general awareness of the impact of international issues and globalization on the agriculture sector after they completed one of CASNR’s international dimension courses (∀: μ₁pre course attitudes, general awareness = μ₂post course attitudes, general awareness).

Methods and Procedures

The investigation was a non–experimental, pretest–posttest descriptive and comparative design study. This quantitative study involved the use of summated–rating scale instruments to gather pretest and posttest data for the purpose of measuring differences resulting from a treatment or intervention effect (Dimitrov & Rumrill, 2003). The measurements of attitude change provided data for analyzing the levels of international awareness of students who participated in the three international dimension courses taught in CASNR during the Fall semester of 2010. The study was designed to explore the assumption that students who participated in the three international dimension undergraduate courses would experience a positive change in attitudes regarding their international awareness.

This was a census study (Patton, 2002) and the target population consisted of all undergraduate students (N = 147) enrolled in three international dimension undergraduate courses offered by CASNR during the Fall semester of 2010. Each international dimension course was worth three credit hours. Although the participants were not selected randomly because the investigation was a census study, students who completed the research instruments were considered to be representative of undergraduates who would have enrolled for these courses in previous semesters or thereafter (Oliver & Hinkle, 1982).

Pretest and posttest survey instruments were used for this study, which consisted of items and scales that were selected after a review of the literature. The instruments’ items were grounded in the conceptual base of the study (i.e., students’ levels of international awareness). The instruments were developed using items from previous studies (i.e., Sammons & Martin, 1997; Wingenbach et al., 2003). Slight modifications were made so that the instruments would address this study’s research questions and hypotheses. The research instruments included three sections: Section I, “Students’ Attitudes regarding CASNR’s Role in Developing Their International Awareness”; Section II, “Students’ Attitudes regarding Their General Awareness of the Impact of International Issues and Globalization on the Agriculture Sector”; and Section III, “Selected Personal Characteristics.”

A summated rating scale, ranging from 1 to 5, was used to measure students’ attitudes regarding CASNR’s role in developing their international awareness: 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), and 5 (strongly agree) (Creswell, 2008). The “real limits” of the scale for this construct were 1.00 to 1.49 (strongly disagree), 1.50 to 2.49 (disagree), 2.50 to 3.49 (neutral), 3.50 to 4.49 (agree), and 4.50 to 5.00 (strongly agree). In the case of students’ attitudes regarding their general awareness of the impact of international issues and globalization on the agriculture sector, a six–point, summated–rating scale was used: 1 (strongly disagree), 2 (disagree), 3 (slightly disagree), 4 (slightly agree), 5 (agree), and 6 (strongly agree) (Creswell, 2008). The “real limits” of the scale for this construct were 1.00 to 1.49 (strongly disagree), 1.50 to 2.49 (disagree), 2.50 to 3.49 (slightly disagree), 3.50 to 4.49 (slightly agree), 4.50 to 5.49 (agree), and 5.50 to 6.00 (strongly agree).

A panel of experts (i.e., faculty of the Department of Agricultural Education, Communications, and Leadership and the Department of Agricultural Economics at Oklahoma State University) was employed to ensure the face and content validity of the instrument. Sammons and Martin (1997) reported a Cronbach’s alpha coefficient of .90 for the 11 attitude–focused items used to measure students’ views on CASNR’s role. Wingenbach et al. (2003) reported a Cronbach’s alpha coefficient of .95 for the 26 attitude–focused items measuring students’ views on the agriculture sector. Post hoc reliability estimates were also established by the researchers: A Cronbach’s alpha coefficient of .82 was found for the 11 attitude–focused items per the College’s role. The 26 attitude–focused items were grouped into three categories conceptually
by the researchers to ascertain construct–based, internal consistency. Per the post hoc procedure, Cronbach’s alpha coefficients were determined: understanding global agriculture (15 items), .86; cultural differences (4 items), .71; and U.S. agriculture in the global context (7 items), .78. The overall reliability estimate for this portion of the instrument was .92.

Pre–course and post–course data were collected on or about the first and last weeks of the Fall 2010 semester. Descriptive statistics were performed to obtain measures of central tendency, mean difference, variability, and effect size (eta squared). Per time and place rationale (Oliver & Hinkle, 1982) regarding the study’s subjects, the researcher also used inferential statistics, i.e., a paired–samples $t$–test was conducted to determine change in students’ attitudes.

**Findings**

*Selected Personal Characteristics of Students*

Of the students who indicated their gender, less than one–half were male and more than one–third were female. Regarding students’ classifications, 42.6% of the students were seniors and 31.9% were juniors. Further, 26.6% of the students indicated agricultural education as their major field of study, and less than one–fifth each majored in animal science, agribusiness, or agricultural leadership, amongst other fields of study. More students who participated in the study were enrolled in AGED 4713 than AGEC 4343 or ANSI 3903. The overall mean Grade Point Average (GPA) of the students was 3.17 with a standard deviation of .43.

Two–thirds of the students who participated in the study were White; 5.3% were Hispanic or Latino, and almost two–thirds spoke only English. Further, 8.5% of the students had participated in a study abroad program before taking one of the three international dimension courses. Two–thirds of the students were enrolled in an international dimension course as required for the completion of their degrees. Further, only 28.7% of the students had read the National Geographic magazine or a similar periodical regularly, and 24.5% had known and interacted extensively with international foreign exchange students before taking their respective course. Further, only 12.2% of the students had any form of an international experience during the Fall semester of 2010.

*Students’ Attitudes Regarding CASNR’s Role in Impacting Their International Awareness*

The statement, *Today’s college graduate in agricultural sciences and natural resources needs an understanding of agricultural systems around the world* had the highest mean score ($M = 4.10; SD = .79$) among the pre course, attitude–focused statements (see Table 1). The pre course, attitude–focused statement that had the lowest mean score ($M = 2.26; SD = .93$) was, *There is no need for CASNR to pursue internationalizing its curriculum because students will gain a global perspective elsewhere*. Students’ overall pre course attitude regarding CASNR’s role in developing their international awareness was in the range of neutral ($M = 3.46; SD = .39$) (see Table 1). The statements students rated more favorably post course, and in the range of agree, were, *Today’s college graduate in agricultural sciences and natural resources needs an understanding of agricultural systems around the world* ($M = 4.45; SD = .63$) and *CASNR students should develop a greater awareness of international issues in agricultural sciences and natural resources* ($M = 4.32; SD = .67$) (see Table 1). The lowest rated attitude–focused statement, post course, and in the range of disagree ($M = 2.33; SD = 1.11$) was, *There is no need for CASNR to pursue internationalizing its curriculum because students will gain a global perspective elsewhere*. Students’ overall post course attitude score regarding CASNR’s role in developing their international awareness was in the range of agree ($M = 3.80; SD = .50$) (see Table 1).
Table 1
Descriptive Statistics for Students’ Attitude Scores regarding CASNR’s Role in Impacting Their International Awareness during the Fall Semester of 2010

<table>
<thead>
<tr>
<th>Attitude–focused Statements</th>
<th>Pre Course $(n = 94)$</th>
<th>Post Course $(n = 98)$</th>
<th>$M$</th>
<th>$SD$</th>
<th>$M$</th>
<th>$SD$</th>
<th>$MD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASNR students should develop a greater awareness of international issues in agricultural sciences and natural resources.</td>
<td>3.83 .70</td>
<td>4.32 .67</td>
<td>+.49</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professors in CASNR should give examples from other countries’ agricultural and natural resources systems when teaching about U.S. systems.</td>
<td>3.65 .84</td>
<td>4.27 .78</td>
<td>+.62</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The curriculum of CASNR should reflect knowledge of the global community.</td>
<td>3.82 .72</td>
<td>4.13 .74</td>
<td>+.31</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professors in CASNR should infuse global awareness into the courses they teach.</td>
<td>3.69 .78</td>
<td>4.12 .75</td>
<td>+.43</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CASNR should offer more international experiences for students.</td>
<td>3.62 .82</td>
<td>3.97 .78</td>
<td>+.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CASNR should encourage students to participate in international internship programs.</td>
<td>3.67 .75</td>
<td>4.09 .76</td>
<td>+.42</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Understanding international issues helps a graduate of CASNR get a job.</td>
<td>3.69 .79</td>
<td>4.04 .82</td>
<td>+.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CASNR should have additional global awareness learning requirements.</td>
<td>3.31 .87</td>
<td>3.35 1.00</td>
<td>+.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CASNR should have a foreign language requirement.</td>
<td>2.45 1.01</td>
<td>2.70 1.13</td>
<td>+.25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is no need for CASNR to pursue internationalizing its curriculum because students will gain a global perspective elsewhere.</td>
<td>2.26 .93</td>
<td>2.33 1.11</td>
<td>+.07</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite</td>
<td>3.46 .39</td>
<td>3.80 .50</td>
<td>+.34</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

“Real limits” of scale: 1.00 to 1.49 (strongly disagree), 1.50 to 2.49 (disagree), 2.50 to 3.49 (neutral), 3.50 to 4.49 (agree), and 4.50 to 5.00 (strongly agree)

Research hypothesis 1. $H_o$ No statistically significant ($p < .05$) difference existed between students’ pre course and post course attitudes regarding CASNR’s role in impacting their international awareness after they completed one of CASNR’s international dimension courses ($H_o$: $\mu_{\text{pre course attitudes, CASNR impact}} = \mu_{\text{post course attitudes, CASNR impact}}$).

A paired–samples $t$–test was conducted to determine if a statistically significant ($p < .05$) difference existed between students’ pre course and post course attitudes regarding CASNR’s role in impacting their international awareness after they completed one of CASNR’s international dimension courses. Overall, $t$–test results revealed a statistically significant difference in students’ attitudes from precourse ($M = 3.46; SD = .394$) to postcourse ($M = 3.79; SD = .49$) (see Table 2), $t(93) = 5.58, p < .000$ (two–tailed) (see Table 3). The mean difference in attitude scores was .33 with a 95% confidence interval ranging from .214 to .450. The eta squared statistic (.251) indicated a large effect size (Cohen, 1988) (see Table 3). The researchers rejected the null hypothesis.
Table 2
Descriptive Statistics for Students’ Pre Course and Post Course Attitude Scores regarding CASNR’s Role in Impacting Their International Awareness during the Fall Semester of 2010

<table>
<thead>
<tr>
<th>Attitude</th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre course</td>
<td>94</td>
<td>3.46</td>
<td>.39</td>
</tr>
<tr>
<td>Post course</td>
<td>94</td>
<td>3.79</td>
<td>.49</td>
</tr>
</tbody>
</table>

“Real limits” of scale: 1.00 to 1.49 (strongly disagree), 1.50 to 2.49 (disagree), 2.50 to 3.49 (neutral), 3.50 to 4.49 (agree), and 4.50 to 5.00 (strongly agree)

Note. Small differences in overall post course mean scores and standard deviations were a result of the types of analyses performed and small differences in data points. Descriptive statistics were performed to obtain the scores in Table 1 with n = 98 and a paired–samples t–test was conducted to obtain the scores in Table 2 with n = 94.

Table 3
Paired Samples t–Test of Students’ Pre Course and Post Course Attitude Scores regarding CASNR’s Role in Impacting Their International Awareness during the Fall Semester of 2010 (n = 94)

<table>
<thead>
<tr>
<th>Attitude</th>
<th>MD</th>
<th>SD</th>
<th>Lower</th>
<th>Upper</th>
<th>t</th>
<th>df</th>
<th>Sig. *</th>
<th>eta²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1 Pre Course and Post course</td>
<td>.33</td>
<td>.57</td>
<td>.21</td>
<td>.45</td>
<td>5.58</td>
<td>93</td>
<td>.000</td>
<td>.25</td>
</tr>
</tbody>
</table>

*p < .05

Students’ Attitudes Regarding Their General Awareness of the Impact of International Issues and Globalization on the Agriculture Sector

The statements, I should know more about agriculture and its importance to the world economy and International agriculture involves more than farming had the highest mean score (M = 5.19; SD = .72 and .85, respectively) amongst the pre course, attitude–focused statements (see Table 4). The pre course, attitude–focused statement that had the lowest mean score (M = 4.43; SD = 1.12) was, Competition between producers worldwide keeps food prices low in my grocery store. Students’ overall pre course attitude score was in the range of agree (M = 4.90; SD = .59) regarding international agricultural issues (see Table 4).

The statements, I should know more about how world agriculture affects food prices in the local grocery store (M = 5.42; SD = .61) and International agriculture involves more than farming (M = 5.42; SD = .61) had the highest mean scores, post course (see Table 4). The statement with the lowest mean score, post course (M = 4.65; SD = .96) was, U.S. agricultural products are superior in quality to products from other countries. Nearly all of the attitude–focused statements, post course, were rated in the range of agree; the overall mean score for the items was 5.23 (SD = .40) (see Table 4).
Table 4

*Descriptive Statistics for Students’ Attitude Scores regarding Their General Awareness of the Impact of International Issues and Globalization on the Agriculture Sector during the Fall Semester of 2010*

<table>
<thead>
<tr>
<th>Attitude-focused Statements</th>
<th>Pre Course (n = 94)</th>
<th>Post Course (n = 98)</th>
<th>MD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I should know more about the differences between developed and developing countries.</td>
<td>4.73 .93</td>
<td>5.20 .79</td>
<td>.47</td>
</tr>
<tr>
<td>I should know more about other countries’ markets for U.S. agricultural products.</td>
<td>5.02 .86</td>
<td>5.30 .68</td>
<td>.28</td>
</tr>
<tr>
<td>I should know more about the cultures of other countries.</td>
<td>4.56 1.05</td>
<td>5.18 .68</td>
<td>.62</td>
</tr>
<tr>
<td>I should know more about my state’s (country’s) agricultural industry and its connections to world trade.</td>
<td>5.03 .90</td>
<td>5.36 .61</td>
<td>.33</td>
</tr>
<tr>
<td>I should know more about agricultural products that my home state (country) sells to other countries.</td>
<td>5.09 .79</td>
<td>5.34 .57</td>
<td>.25</td>
</tr>
<tr>
<td>I should know more about how world agriculture affects food prices in the local grocery store.</td>
<td>4.99 .90</td>
<td>5.42 .61</td>
<td>.43</td>
</tr>
<tr>
<td>I should know more about how world events affect local agriculture in my community.</td>
<td>5.01 .85</td>
<td>5.30 .63</td>
<td>.29</td>
</tr>
<tr>
<td>I should know more about the agricultural products from other countries that are consumed in my state (country).</td>
<td>4.83 .90</td>
<td>5.29 .65</td>
<td>.46</td>
</tr>
<tr>
<td>Learning more about agriculture in other countries will help me understand future changes in world agricultural production.</td>
<td>4.95 .93</td>
<td>5.17 .69</td>
<td>.22</td>
</tr>
<tr>
<td>Marketing agricultural products to other countries will help my state’s (country’s) economy.</td>
<td>5.03 .82</td>
<td>5.17 .69</td>
<td>.14</td>
</tr>
<tr>
<td>Marketing U.S. agricultural products to other countries will help the U.S. economy.</td>
<td>5.03 .84</td>
<td>5.15 .65</td>
<td>.12</td>
</tr>
<tr>
<td>Politics has a major effect on world agriculture.</td>
<td>5.02 .72</td>
<td>5.26 .66</td>
<td>.24</td>
</tr>
<tr>
<td>The U.S. culture has a major effect on agriculture in other countries.</td>
<td>4.68 1.03</td>
<td>5.19 .74</td>
<td>.51</td>
</tr>
<tr>
<td>World events impact the agricultural industry in my community.</td>
<td>4.83 .88</td>
<td>5.29 .72</td>
<td>.46</td>
</tr>
<tr>
<td>Global food production affects food prices in my local grocery store.</td>
<td>4.85 .88</td>
<td>5.22 .70</td>
<td>.37</td>
</tr>
<tr>
<td>International agriculture involves more than farming.</td>
<td>5.19 .85</td>
<td>5.42 .61</td>
<td>.23</td>
</tr>
<tr>
<td>Global agriculture is different from one country to another.</td>
<td>5.02 .90</td>
<td>5.29 .66</td>
<td>.27</td>
</tr>
<tr>
<td>Global food production allows me to eat a variety of products all year.</td>
<td>5.15 .76</td>
<td>5.41 .66</td>
<td>.26</td>
</tr>
<tr>
<td>Natural disasters affect the price of food in my local grocery store.</td>
<td>5.01 .86</td>
<td>5.37 .66</td>
<td>.36</td>
</tr>
<tr>
<td>In times of famine, the U.S. should help other countries with food aid.</td>
<td>4.76 1.01</td>
<td>5.22 .70</td>
<td>.46</td>
</tr>
<tr>
<td>The U.S. should actively help other countries develop their agricultural industries.</td>
<td>4.72 .93</td>
<td>5.17 .75</td>
<td>.45</td>
</tr>
<tr>
<td>Competition between producers worldwide keeps food prices low in my grocery store.</td>
<td>4.43 1.12</td>
<td>5.11 .80</td>
<td>.68</td>
</tr>
<tr>
<td>Understanding other cultures helps U.S. producers market their products abroad.</td>
<td>4.84 .88</td>
<td>5.16 .70</td>
<td>.32</td>
</tr>
<tr>
<td>Understanding global politics helps U.S. producers market their products abroad.</td>
<td>4.83 .76</td>
<td>5.05 .71</td>
<td>.22</td>
</tr>
<tr>
<td>U.S. agricultural products are superior in quality to products from other countries.</td>
<td>4.61 1.08</td>
<td>4.65 .96</td>
<td>.04</td>
</tr>
<tr>
<td>Composite</td>
<td>4.90 .59</td>
<td>5.23 .40</td>
<td>.33</td>
</tr>
</tbody>
</table>

“Real limits” of scale: 1.00 to 1.49 (*strongly disagree*), 1.50 to 2.49 (*disagree*), 2.50 to 3.49 (*slightly disagree*), 3.50 to 4.49 (*slightly agree*), 4.50 to 5.49 (*agree*), and 5.50 to 6.00 (*strongly agree*)
Research hypothesis 2. Ho 2  No statistically significant (p < .05) difference existed between students’ pre course and post course attitudes regarding their general awareness of the impact of international issues and globalization on the agriculture sector after they completed one of CASNR’s international dimension courses (H2).

\[ \mu_{\text{pre course attitudes, general awareness}} = \mu_{\text{post course attitudes, general awareness}} \]

A paired–samples \( t \)–test was conducted to determine if a statistically significant (\( p < .05 \)) difference existed between students’ pre course and post course attitudes regarding their general awareness of the impact of international issues and globalization on the agriculture sector after they completed one of CASNR’s international dimension courses. Overall, \( t \)–test results revealed a statistically significant difference in students’ attitudes from precourse (\( M = 4.90; SD = .59 \)) to postcourse (\( M = 5.25; SD = .39 \)) (Table 5), \( t(93) = 4.64, p < .000 \) (two–tailed) (Table 6). The mean difference in attitude scores was .35 with a 95% confidence interval ranging from .199 to .496. The \( \eta \) squared statistic (.188) indicated a large effect size (Cohen, 1988) (Table 6). The researcher rejected the null hypothesis.

Table 5
Descriptive Statistics for Students’ Pre Course and Post Course Attitude Scores regarding Their General Awareness of the Impact of International Issues and Globalization on the Agriculture Sector during the Fall Semester of 2010

<table>
<thead>
<tr>
<th>Attitude</th>
<th>n</th>
<th>M*</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre course</td>
<td>94</td>
<td>4.90</td>
<td>.59</td>
</tr>
<tr>
<td>Post course</td>
<td>94</td>
<td>5.25</td>
<td>.39</td>
</tr>
</tbody>
</table>

“Real limits” of scale: 1.00 to 1.49 (strongly disagree), 1.50 to 2.49 (disagree), 2.50 to 3.49 (slightly disagree), 3.50 to 4.49 (slightly agree), 4.50 to 5.49 (agree), and 5.50 to 6.00 (strongly agree)

Note. Small differences in overall post course mean scores and standard deviations were a result of the types of analyses performed and small differences in data points. Descriptive statistics was performed to obtain the scores in Table 4 with \( n = 98 \) and a paired–samples \( t \)–test was conducted to obtain the scores in Table 5 with \( n = 94 \).

Table 6
Paired Samples \( t \)–Test of Students’ Pre Course and Post Course Attitude Scores regarding Their General Awareness of the Impact of International Issues and Globalization on the Agriculture Sector during the Fall Semester of 2010 (\( n = 94 \))

<table>
<thead>
<tr>
<th>Attitude</th>
<th>MD</th>
<th>SD</th>
<th>95% Confidence Interval of the Difference</th>
<th>t</th>
<th>df</th>
<th>Sig.*</th>
<th>( \eta )^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1</td>
<td>.35</td>
<td>.72</td>
<td>.199 to .496</td>
<td>4.64</td>
<td>93</td>
<td>.000</td>
<td>.18</td>
</tr>
</tbody>
</table>

*p < .05

Conclusions and Implications

More male students than females participated in the study, and they were mostly seniors and juniors by classification who majored in agricultural education, animal science, agribusiness, or agricultural leadership. More of the students who participated in the study were enrolled in AGED 4713. The students’ overall mean Grade Point Average (GPA) was 3.17 with a standard deviation of .43. Most of the students were White, non–Hispanic or Latino, and spoke only English.

A majority of the students had not participated in a study abroad program before taking the international dimension course. Moreover, most of the students were enrolled in an international dimension course because it was
a requirement for completion of their degrees. A few of the students had read the *National Geographic* magazine or a similar periodical regularly, or had known and interacted extensively with foreign exchange students before taking an international dimension course (i.e., self-reported). Only a handful of students had an international travel experience during the Fall semester of 2010.

Students’ attitudes regarding CASNR’s role in developing their international awareness changed from somewhat favorable pre course (i.e., in the range of neutral) to favorable post course or in the range of agree. Moreover, a statistically significant difference ($p < .05$) existed in students’ attitudes, from pre course to post course, regarding CASNR’s role in impacting their international awareness. This difference held practical importance (see Table 3).

The theory of planned behavior focuses on how to change the behavior of individuals, which is dependent on predicting deliberate or intended behavior (Ajzen, 1991). Ajzen (2006) noted that, “[a]ttitude toward behavior is defined as a person’s overall evaluation of performing the behavior in question” (p. 5). This study’s findings support the theory of planned behavior because students formed more favorable attitudes toward CASNR’s role in internationalizing their curriculum after participating in one of the international dimension courses.

Students’ pre course and post course attitudes regarding their general awareness of the impact of international issues and globalization on the agriculture sector were favorable, i.e., in the range of agree. Further, a statistically significant difference ($p < .05$) existed in students’ attitudes regarding their general awareness of the impact of international issues and globalization on the agriculture sector from pre course to post course; their level of agreement increased significantly ($p < .05$). This difference in students’ attitudes from pre course to post course held practical importance (see Table 6).

This finding implies students already had favorable attitudes toward international issues and globalization even before taking the international dimension courses, which was an indication of the value they placed in such courses and what they expected to gain (Feather, 1992). The finding further implies that students’ pre course attitudes predicted their post course attitudes because they started the international dimension courses with fairly high motivation and expectation. Results of the study support the expectancy–value theory (Feather, 1992), which explains and predicts the attitudes of individuals toward certain actions they take. The theory posits that the motivation of learners is influenced by how much value they place on, and their expectation to succeed at, achieving a pre–determined goal. Students who give their courses high value will have high motivation to succeed in those learning experiences (Feather, 1992).

**Recommendations for Further Research**

Even though this was a census study, a limitation was that only undergraduate students who were enrolled in the international dimension courses offered by CASNR at Oklahoma State University were surveyed. Students enrolled in international dimension courses at other U.S. universities were not included in the study. This limits the generalizability of the study’s findings. Therefore, similar studies should be conducted at other U.S. universities with Colleges of Agriculture, taking into account their differences and needs. Moreover, future researchers are encouraged to use probability sampling, which “is the most rigorous form of sampling in quantitative research because the investigator can claim that the sample is representative of the population and, as such, can make generalizations to the population” (Creswell, 2008, p. 153).

Additional studies also should be conducted using a mixed methods research design (Creswell, 2008) to facilitate the investigators and other consumers of the research understanding better the impact of international dimension courses on students’ attitudes in regard to international awareness. Combining qualitative and quantitative data is an effective strategy to overcoming confounded outcomes that may be due to the combined effects of several factors. Greene, Caracelli, and Graham
(1989) outlined five points by which mixed methods research designs may enhance a study’s value: triangulation, complementarity, development, initiation, and expansion.

**Recommendations for Practice**

College administrators and faculty should encourage a diverse population of students to enroll in CASNR’s international dimension courses. This approach would enhance broader participation in the internationalization process by students who are diverse racially and/or ethnically. Other citizens and stakeholders from the wider university community also should be engaged (Navarro, 2004) in OSU’s internationalization activities.

Students’ attitudes were more or less neutral (see Table 1) regarding a foreign language requirement for degree completion. However, based on students’ slight shift in agreement, CASNR officials should consider adding a foreign language component to students’ degree requirements. Students who learn other languages are successful when involved in diverse environments (Cook, 2009; Hayward, 2000). Further, requiring students to learn other languages would increase their participation in study abroad programs because they would be prepared better to overcome problems associated with language barriers (Bok, 2006).

**Discussion**

The role of CASNR in developing students’ international awareness may have been a concern of some stakeholders. Some skeptics may have even questioned the effectiveness of these courses with regards to the attitudes students form after having completed one of the international dimension courses. The study’s findings revealed that students’ attitudes regarding CASNR’s role in developing their international awareness changed favorably from the time they started to the time they completed their respective international dimension course. This finding reinforces the important role higher education institutions play in assisting students to become global thinkers (Navarro, 2004; Navarro & Edwards, 2008). The views of university educators have been influenced by the forces of globalization and this has changed the dynamics of formal education significantly (Hayward, 2000; Smith, 2002). “The impact and pervasiveness of these forces of globalization also means that they [i.e., university faculties,] should be a fundamental focus for education and learning” in regard to globalization (Smith, 2002, ¶ 2).

Comparing students’ attitudes revealed that the international dimension courses investigated met the need for which they are intended. The results of this study are useful in informing course instructors and CASNR administrators on how to improve the existing courses or provide insight about different curricular offerings entirely. If U.S. universities internationalize their curricula adequately, graduates, who participate in international dimension courses, should experience a positive change in attitudes, resulting in their having higher levels of international awareness. Therefore, as Ajzen (1991) posited, increased behavioral beliefs in concert with enhanced control beliefs should augment a person’s future actions.

**References**


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Incorporating Learning Objects in a Curriculum Re-design to Meet Needs of Students with Specific Learning Disabilities in Illinois Agricultural Education Programs

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Southern Illinois University

A quasi-experimental pilot study of curriculum re-design using Learning Objects (LO) to instruct agricultural education students with Specific Learning Disabilities (SLD) was conducted in five high schools in the federally designated economically distressed area, the Illinois Delta Region. Six LOs were developed based on a unit of instruction in The Illinois Core Curriculum for Agriculture and designed in a manner appropriate to SLD students. Students were randomly assigned to treatment and control groups. Results from pre-posttests in this study found Learning Objects increased learning for both SLD and traditional students.

Keywords: agricultural education; learning disabilities (LD); curriculum redesign; learning objects; specific learning disabilities (SLD)

Introduction

Recently, educators and researchers have noted the pressing lack of instructional methods modified to meet or accommodate learning disabled agricultural education students’ unique needs (Dormody, Seevers, Andreasen & VanLeeuwen, 2006; Pense, 2009; Easterly & Myers, 2011). In an attempt to address this necessity, a national mandate calling for appropriate vocational education for students with specific learning disabilities (SLD) has repeatedly been issued (Perkins, 2006). Furthermore, studies have clearly set out that a need exists for placing a high priority on teacher in-service for instructing the SLD student, and a need exists for re-designing the agricultural education curriculum to meet the needs for these students (Sorenson, Tarpley, & Warnick, 2010).

In response, only two studies have thus far sought to identify methods that can best meet the needs of SLD students in the agricultural education classroom; namely, inquiry based instruction (Easterly & Myers, 2011) and technology-assisted curricular redesign (Pense, Wakefield & Watson, 2010). With nearly one fourth of students enrolled in secondary agricultural education possessing an SLD (Dormody, Seevers, Andreasen & Vanleeuwen, 2006; Pense, 2009), further curriculum development and inquiry into appropriate teaching methodology for SLD students is clearly needed.

Learning Objects as an Instructional Aid

In an effort to address curriculum redesign appropriate to SLD students in the agricultural education classroom, Learning Objects (LO) became the focus of this study. LOs constitute a valuable and underutilized instructional/learning tool which can be readily implemented to develop and expand the impact of current
curriculums to meet the needs of the learning disabled student in the agricultural education classroom. LOs are defined as “interactive web-based tools designed to enhance, amplify and guide learning” (Baki & Cakiroglu, 2010, p. 1459). Learning qualities have been further emphasized; including a focus on “interaction and the degree to which the learner actively constructs knowledge” (Kay & Knaack, 2009, p. 148).

While little or no research on LO use in the agricultural education classroom has been published, studies of LOs used in k-12 mathematics and science have demonstrated its usefulness for instruction and learning. Kay and Knaack (2009) conducted an evaluation of LOs used in 21 high school math and science programs and found positive correlations between pre- posttest scores and the student perceptions of LO learning, quality and engagement constructs. When selecting LOs, they concluded that key features should guide selection; including interactivity, clear feedback, graphics, design qualities, clear instructions, and transparency of use and organization.

In another study on LO use in secondary mathematics programs, Baki and Cakiroglu (2010) found that students evaluated LOs as highly sufficient in the categories of learning value, value added, design usability and technology function. Teachers in the same study found LOs provided interesting scenarios and problems, helped in student comprehension, and was motivational; thus, they concluded LOs were useful in constructing rich learning environments.

Learning Object Repositories
To allow LOs to be used with any learning management system, they should be compliant with the Shareable Content Object Reference Model (SCORM). This model comprises a set of technical standards for e-learning software products. One of the standards requires LOs to contain metadata, or descriptive information in tags, that support context sensitive retrieval by web search engines (Schlais & Ploetz, 2005). Thus, LOs can then be placed in a repository and made available to all educators.

In some instances, schools use a form of SCORM called Shareable Content Learning Objects (SCLO). However, SCLO is not quite SCORM compliant; the LOs would still be sharable, but could not be disassembled, could not be edited and resulting components could not be reassembled to address current pedagogical needs (Schlais & Ploetz, 2005).

Theoretical Framework
The framework for this study (Figure 1) was based on five theoretical concepts taken from other studies: inclusion (Bloom, Perlmutter & Burrell, 1999), student engagement (Shernoff, Csikszentmihalyi, Schneider & Shernoff, 2003), assistive technology (Forgrave, 2002), principles of curriculum re-design for the SLD student (Heward, 2009), and evaluation of learning objects (Kay & Knaack, 2009). These five components may be viewed as two phases in the development of Learning Objects for use in re-designing curriculum for SLD students.

Phase 1: Re-Designed Curriculum, Learning Object Development
Phase 1, the upper most part of the triangle in Figure 1, includes theoretical principles which must be taken into account when developing or re-designing technology assisted curriculum for the SLD student. These principles include inclusion, student engagement and assistive technology.

Inclusion
The inclusion aspect of the model comprises four major principles, including diversity, individual needs, reflective practice and collaboration (Elbert & Baggett, 2003). Diversity is brought about when SLD students interact with traditional students in the agricultural education classroom. Individual needs are observed when students select a career pathway and when the curriculum is adapted to the special needs of the SLD student. The instructor may also engage in reflective practice and make appropriate adaptations to the curriculum (Bloom et al., 1999). According to researchers in agricultural education (Dormody et al., 2006; Kessell, Wingenbach & Lawver, 2009), reflective practice and confidence were critical for the teacher who must develop “competency in working with disabled students”
(Dormody et al., 2006, p. 94). Reflection is particularly necessary when dealing with the challenges faced when instructing SLD students. Collaboration occurs not only when the teacher cooperates with parents, specialists, and community; but also when interaction takes place between the SLD student and his/her non-disabled peers.

Figure 1. Conceptual Model of Curriculum Re-Design and Evaluation of Learning Objects for SLD Students

**Student Engagement**

The second concept in Phase 1 of the framework, student engagement, addresses student motivation and strategies to increase engaging tasks and activities in the curriculum. Shernoff, et al. (2003) posited that student engagement addressed motivation through the culmination of concentration, interest, and enjoyment. Similar to the concept of flow theory, in which “a symbiotic relationship between challenges and skills is needed” (p. 160); concentration, interest and enjoyment during a learning activity are also to be simultaneously experienced to create “flow” (p. 161).
Assistive Technology

Assistive technology, the third concept of Phase 1 in the framework, provides the accommodations needed by SLD students (Forgrave, 2002), and may aid in creating flow by balancing skill with challenge for each SLD student. Assistive technology helps deliver the information while enabling students to complete tasks more efficiently and independently; thus, leading to improved performance (Hasselbring & Bausch, 2005).

Phase 2: Curriculum Development & Implementation

While Phase 1 of the framework laid the groundwork for the process of curriculum re-design, Phase 2 provided a framework to actually develop, implement and evaluate LO use in the classroom. This phase of the framework included Curriculum Re-Design (LO Development), Learning and Engagement.

Curriculum Re-Design & LO Development

To help an SLD student better construct new knowledge, the LO development model of Schlais and Ploetz (2005), suggests the Textual, Conceptual and Practical (TCP) approach. This project was textual in that it used basic English phrases with a voice over on each slide; it was conceptual in its use of illustrations with text; and it was practical in that it provided practice/praxis and was self-paced. Such an approach has lent itself to better use of the downloadable material so that the LOs could be “disassembled, edited and the resulting components reassembled for use in contexts more appropriate to pedagogical needs” (Schlais & Ploetz, 2005, p. 2).

Learning

Student evaluation of the learning value of LOs was highest among four categories evaluated in Baki and Cakiroglu’s study of secondary mathematics programs (2010). Teachers in the same study concluded that LOs were beneficial tools for learning; as LOs are implemented, increased learning takes place.

Engagement

A high level of engagement was thought to be necessary if an LO was to be successful. Kay and Knaack (2009) cited Lin and Gregor (2006) when they identified engagement, positive affect and personal fulfillment as key factors in LO evaluation. Furthermore, self-efficacy was identified as critical in the process of engagement (Oliver & McLoughlin, 1999). Engagement was accomplished through the implementation of the six major principles for effective instructional design advocated by Heward (2009); including, big ideas – selected concepts that facilitate knowledge acquisition, conspicuous strategies – sequence of teaching to make learning steps explicit, mediated scaffolding – temporary learning support for students which is faded over time, strategic integration – instructional sequencing relating SLD and new knowledge, judicious review – adequate sequencing and scheduling of learning opportunities, and explicit instruction – presenting and monitoring repeated learning opportunities incrementally.

Learning Object Evaluation

The final component of the theoretical model (Figure 1) was evaluation of the LOs. Learning Objects have traditionally been evaluated through technical and instructional design issues, rather than employing issues based on pedagogy (Kay & Knaack, 2009). The emphasis on design had resulted in a model that was dated, while recent research cited by Kay and Knaack in 2009 (Friesen & Anderson, 2004; Krauss & Ally, 2005; Nurmi & Jaakkola, 2006) suggested students need to construct knowledge and participate in the learning process. One way this could be accomplished was by measuring the amount and quality of interactivity in an LO. While pointing and clicking may be passive, manipulation of tools in the LO require the user to test and evaluate what-if scenarios; which may result in stimulation/motivation (Kay & Knaack, 2009). This study chose the technical design issues which focused on usability as a measure of engagement and learning, in addition to measuring knowledge acquisition through traditional means.

Purpose/Objectives

The purpose of this study was to create and assess LOs based on a unit of instruction from
The Illinois Core Curriculum (Illinois State Board of Education, 2004) in a manner appropriate to the SLD student, administer the lessons to students in secondary agricultural courses, and compare gain scores through pre- and posttests for both treatment and control groups. The specific objectives were:

1. Develop a demographic profile of the participating schools in the curricular redesign study.
3. Compare/contrast the gain scores of SLD students in agricultural education classes who were taught using the curriculum enhanced with Learning Objects to those of SLD students taught using the curriculum without Learning Objects.
4. Compare/contrast the gain scores of non-SLD students in agricultural education classes who were taught using the curriculum enhanced with Learning Objects to those of non-SLD students taught using the curriculum without Learning Objects.

**Methods/Procedures**

This study employed a pre- posttest design to measure the effectiveness of LOs incorporated into an agricultural education curriculum. The target population for the study included agricultural education students enrolled in Introduction to Agriculture courses (N = 98) in five high schools in the federally designated economically distressed area (Lower Mississippi Delta Region Initiatives Act, 1994), the Illinois Delta Region (Anna-Jonesboro H.S., Goreville H.S., Marion H.S., DuQuoin H.S. and Vienna H.S.). Of 42 secondary schools located in the Delta Region, five schools comprised a purposive sample selected for their location in the Delta Region, the schools possessing an agricultural education program, and administrator agreement to participate in the project by granting access to the research site. This study focused on students in the Illinois Delta Region because it has been suggested that serious socioeconomic problems in rural areas (Bajema, Miller & Williams, 2002) have resulted in more learning disabled students in these regions (Pense, 2009).

**Curriculum Re-Design**

A horticulture unit of instruction from the Illinois Core was employed in this study to create six LOs that would address the needs of SLD students (see Repository under Teacher Resources at http://teachag.siu.edu/). Technology choices were examined based on the recommendations of King-Sears and Evmenova (2007) that it be “efficient, cost effective and gets the job done” (p. 9). Microsoft® PowerPoint® software was therefore chosen as the medium.

The six principles of instructional design advocated by Heward (2009) guided the design of the LOs; including big ideas, conspicuous strategies, mediated scaffolding, strategic integration, judicious review, and explicit instruction. Teacher educators in agriculture education and special education validated the newly developed LOs using these principles. Such a validation process helps to ensure appropriate language and content in the newly developed curriculum (Wiersma & Jurs, 1990).

Students from two groups were then randomly assigned to treatment and control groups. All students received instruction using lecture and power point presentation from lessons in The Illinois Core Curriculum. Following instruction, the treatment groups worked through the newly developed LOs designed to enhance the daily lessons, while the control groups were given lab work unrelated to the lessons.

Ten intervening variables were identified by Joy and Garcia (2000) from a meta-analysis study by Rachal (1993) for studies of computer aided instruction. Seven of these were addressed in this study of LOs; including, random assignment of groups, pretesting to account for prior knowledge, grouping by student ability, accounting for differing learning styles through the six major principles for instructional design, teacher effects by utilizing five different sites and their instructors, instructional method by utilizing the state core curriculum as a basis of
instruction, and media familiarity by providing LOs through a simple but effective computer application.

**Procedure**

Pre-service agricultural education teachers (university students) were trained to administer the pre- and posttests, conduct instruction using the Illinois Core Curriculum, and supervise use of the newly developed LOs. The project workers then traveled to each of the five school sites during April and May, 2011 to administer the pretests to 97 students enrolled in Introduction to Agriculture courses. All students received instruction from the project workers using the lesson plans and power point presentations taken from The Illinois Core Curriculum for Agriculture. However, students were randomly divided into two groups: one group to be given the self-paced LOs after each lesson in Horticulture, and the other group to receive unrelated instruction in a laboratory setting from their usual teacher after each lesson. Students were told only one purpose of the study: to compare student performance through curriculum enhanced by the use of LOs with student performance through curriculum not enhanced with LOs. They were not told the study was targeting SLD students, in an effort to protect the SLD student from being singled out. Posttests were administered once all three lessons had been completed.

Items in the pre- and posttests numbered 24 and were multiple-choice. Students recorded their answers on a Mark Reflex answer sheet by NCS. Due to student absences on either the pre- or posttest, only 83 usable pre- and posttest scores were obtained from the population (N = 98).

**Instrumentation**

To assess learning, pre- and posttests (parallel forms) were developed in an earlier project derived from the same unit of study in the Illinois Core Curriculum (Pense, 2009). Content validity was addressed by adhering to the original lesson plans in the core curriculum, and through review by a panel of experts consisting of two agricultural education professors and one special education professor. The pre- posttests were pilot-tested with 16 students enrolled in an Introduction to Agriculture course at Eldorado High School in Eldorado, Illinois. Initially, the pretest yielded a KR-20 reliability coefficient of .68 (Table 1).

An item analysis yielded a difficulty index score and a mean discrimination index for each of the 24 multiple choice questions. The same panel of researchers then determined whether to retain, reword or remove each test item. The pre- and posttests also underwent revision to ensure that each item was written based on Gronlund and Waugh’s (2009) rules for multiple choice items. A second pilot test conducted with a different class of 17 students at Eldorado High School in Eldorado, Illinois, yielded a KR-20 reliability coefficient of .90 for the pretest. Developed from the revised pretest, the posttest yielded a KR-20 reliability coefficient of .78 (Table 1).

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Kuder-Richardson Formula 20 (KR-20) Reliability Coefficients for Pre- and Posttests Prior To and After Test Revision</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>KR-20 reliability coefficients</td>
</tr>
<tr>
<td>Pretest</td>
<td>0.68</td>
</tr>
<tr>
<td>Posttest</td>
<td>----</td>
</tr>
</tbody>
</table>

*Note.* Posttest was a parallel form constructed from 1st pilot test; resulting in a single reliability coefficient.

**Results/Outcomes**

Demographic data for the study sites (Table 2) was retrieved from the Illinois Agricultural Education website: http://www.agriculturaleducation.org/. Each research site was a high school incorporating grades 9 through 12, and were located in rural
settings; specifically, in the Illinois Delta Region, a federally designated economically distressed area. The student population of each school ranged from 184 to 1115. Three of the schools used the traditional 50-minute Carnegie unit based on seven- to eight-period schedules on an 18-week semester. Two of the schools employed a four-block schedule. The number of minority students in the agricultural education program at each site was negligible, with a maximum of two in any one program. Representation of SLD students at each site ranged from 6 to 25 per program.

In three of the five schools tested in the study, male students outnumbered the female students (Table 3); 22 males and 5 females in school 1, 13 males and 5 females in school 3, and 16 males and 5 females in school 4; as opposed to 11 females and 6 males in School 2 and 10 females and 7 males school 5. Intervening factors resulted in a small number of SLD students (Table 3) who completed both the pre- and posttests, ranging in number from no SLD students in school 4 to four SLD students in schools 1, 3, and 5.

Table 2
**Demographic Information on Five Schools in the Study and One School in the Pilot Test**

<table>
<thead>
<tr>
<th>Research sites</th>
<th>Pilot</th>
<th>Sch. 1</th>
<th>Sch. 2</th>
<th>Sch. 3</th>
<th>Sch. 4</th>
<th>Sch. 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>School type</td>
<td>Rural</td>
<td>Rural</td>
<td>Rural</td>
<td>Rural</td>
<td>Rural</td>
<td>Rural</td>
</tr>
<tr>
<td>Grade levels</td>
<td>9-12</td>
<td>9-12</td>
<td>9-12</td>
<td>9-12</td>
<td>9-12</td>
<td>9-12</td>
</tr>
<tr>
<td>Student population</td>
<td>345</td>
<td>530</td>
<td>184</td>
<td>1115</td>
<td>423</td>
<td>353</td>
</tr>
<tr>
<td>Class schedule</td>
<td>7 Per.</td>
<td>7 Per.</td>
<td>7 Per.</td>
<td>7 Per.</td>
<td>4 Blk.</td>
<td>4 Blk.</td>
</tr>
<tr>
<td>Minority students</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>IEPs in ag program</td>
<td>25</td>
<td>20</td>
<td>6</td>
<td>14</td>
<td>6</td>
<td>20</td>
</tr>
</tbody>
</table>

*Note. Sch.= School, Per.= Period, Blk.=Block*

Table 3
**Number of Students in Study by Gender and Type of Student**

<table>
<thead>
<tr>
<th>Research sites</th>
<th>Sch. 1</th>
<th>Sch. 2</th>
<th>Sch. 3</th>
<th>Sch. 4</th>
<th>Sch. 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Trad</td>
<td>18</td>
<td>5</td>
<td>10</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>Male SLD</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Female Trad</td>
<td>5</td>
<td>10</td>
<td>4</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Female SLD</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>15</td>
<td>14</td>
<td>21</td>
<td>13</td>
</tr>
</tbody>
</table>

A series of LOs were constructed for a unit of instruction in horticulture; being redesigned by a subject matter specialist to include objectives, learning activities and evaluation instruments. These LOs were produced using Microsoft Power Point. They contained voice-over recordings, employed interactive components to increase student learning and retention for the SLD student, and were housed in a repository under Teacher Resources at http://teachag.siu.edu/. The six LOs addressed the following three subject areas: Lesson 1 – Understanding horticulture; Lesson 2 – Determining the importance of the horticulture industry; Lesson 3 – Exploring career opportunities in horticulture.

Both the treatment and control groups of SLD students (Table 4) scored higher in the posttest over the pre-test. The treatment group, students who were given access to LOs, obtained a mean score of 11.0 (SD = 3.16) in the pre-test, and obtained a mean score of 16.33 (SD = 5.61) in the posttest. The total gain score computed from these results for the treatment
The control group of students who did not receive access to the LOs obtained a mean score of 9.43 ($SD = 2.76$) on the pre-test, and obtained a mean score of 10.14 ($SD = 4.67$) on the posttest. The total gain score for the control group was 0.71.

<table>
<thead>
<tr>
<th>Table 4</th>
<th>SLD Student Pre-Posttest Mean Scores and Gain Scores for Treatment &amp; Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLD student mean scores</td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>n</td>
</tr>
<tr>
<td>Treatment</td>
<td>6</td>
</tr>
<tr>
<td>Control</td>
<td>6</td>
</tr>
<tr>
<td>Gain score difference</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Gain score was calculated as posttest minus pre-test.

The treatment and control groups of the traditional students (Table 5), also consistently scored higher in the posttest over the pretest. The treatment group of traditional students who were given access to LOs obtained a mean score of 13.05 ($SD = 3.06$) in the pre-test, and obtained a mean score of 17.73 ($SD = 3.52$) in the posttest. The total gain score computed from these results for the treatment group of traditional students was 4.68. The control group of traditional students who did not receive access to the LOs obtained a mean score of 13.03 ($SD = 3.41$) on the pre-test, and obtained a mean score of 16.92 ($SD = 3.83$) on the posttest. The total gain score for the control group of traditional students was 3.89.

<table>
<thead>
<tr>
<th>Table 5</th>
<th>Traditional Student Pre-Posttest Mean Scores and Gain Scores for Treatment &amp; Control Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional students</td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>n</td>
</tr>
<tr>
<td>Treatment</td>
<td>36</td>
</tr>
<tr>
<td>Control</td>
<td>35</td>
</tr>
<tr>
<td>Gain score difference</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Gain score was calculated as posttest minus pre-test.

It should be noted, however, that the overall score achieved by the SLD students in the posttest was only 33% ($M = 16.33$, $SD = 5.61$) and the overall score achieved by the traditional students in the posttest was only 35% ($M = 17.73$, $SD = 3.52$).

**Conclusions**

These findings should not be generalized beyond the population of this pre-posttest quasi-experimental study. The amount of data generated, however, carries implications for all agricultural education programs. Analysis of the major findings for objectives three and four led to the following conclusions:

1. Learning Objects, as one form of a re-designed curriculum in agricultural education, made a positive difference in student knowledge acquisition for SLD students (treatment group mean gain score was 5.33; gain score difference between treatment and control group means was 4.62).
2. Learning Objects, as one form of a re-designed curriculum for agricultural education, made a positive difference in
student knowledge acquisition for non-SLD students (treatment group mean gain score was 4.68; gain score difference between treatment and control group means was 0.79).

3. Learning Objects as a form of a re-designed curriculum for SLD students resulted in greater gain scores for SLD students than for non-SLD students in agricultural education.

4. Overall mean scores in the posttest were low for both groups of students; SLD student mean score in the posttest was 33% \((M = 16.33, SD = 5.61)\), while the traditional student mean score in the posttest was 35% \((M = 17.73, SD = 3.52)\).

Implications

A primary goal of learning objects is to provide a repository of teaching materials that can be combined into multiple lessons. For example an introduction to a horticulture lesson might have a component on definition of key terms. The definition of each term could be an LO. The instructor would link together the LOs of the number of definitions appropriate for one or a group of SLD students to use in a single lesson. Depending on the type and level of a student’s SLD, a teacher could string together different sets of LOs to best meet the ability level of the student. For example a lesson for one SLD student may include only the essential definitions and examples related to Horticulture, but for another SLD student additional background and application material may be incorporated into a lesson.

In this case, a key requirement of an LO repository is that it contain an appropriate amount of content on a subject, and the content be “broken” into relatively small chunks with the idea that each chunk would only be a small part of a lesson. The LO material must also be provided in such a manner that teachers can readily string together LOs for lesson development. Each LO may contain link(s) to background or example material and the instructor may need control to turn the background/example links on or off for different students.

Given that nearly 23% of students in the agricultural education classroom possess specific learning disabilities, the agriculture industry risks losing nearly a quarter of its workforce. Learning Objects are yet another tool available to the agricultural education instructor for effectively meeting the needs of not only SLD students, but also the traditional students in the classroom. By utilizing such methods, the needs of all students are met and the future workforce is protected.

Recommendations

Since curriculums can effectively be redesigned with LOs to improve learning for SLD and traditional students, additional work is needed to:

1. Determine the appropriate subject matter size of LO content for inclusion in lessons for SLD students.
2. Develop and implement methods for agricultural education teachers to integrate LOs into lesson plans for SLD students, while minimizing preparation time.
3. Query agriculture teachers to provide recommendations on the amount of subject matter to include in each LO.
4. Establish appropriate LO cataloging and metadata requirements for SLD students in agricultural education.
5. Evaluate software tools and provide recommendations on best practices for linking LOs in lesson preparation for SLD students in agricultural education.

References


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A Content Analysis of Teaching Philosophy Statements of Award Winning Colleges of Agriculture Professors

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As our economy calls for improved employment skills, educational institutions must provide quality teaching to prepare students for success. Researchers purport that an important factor in determining student learning is the teacher, and that one of the most prominent factors in student achievement is teacher quality. The search for the attributes, dispositions, knowledge, and instructional skills that define effective teachers continues as scholars seek to discover the teacher variables that lead to student achievement. The purpose of the descriptive research was to identify themes present in the teaching philosophy statements of the United States Department of Agriculture Excellence in College and University Teaching in the Food and Agricultural Sciences award recipients. Content analysis technique was utilized in reviewing the provided espoused philosophy statements of award winners from 2000 – 2010. Findings include identification of eleven emergent themes. Future recommendations would include a study to determine if a disconnect exists between the stated teaching philosophy of award winning professors and their actual teaching practice. Further application would be to analyze the classroom practice of award winning professors and the impact had on student learning.

Keywords: effective teaching, teaching philosophy, teaching and learning, award winning professors

Introduction

Today, a higher education is not just a pathway to opportunity – it is a prerequisite. Over the next decade, nearly eight in ten new job openings in the U.S. will require some workforce training or postsecondary education, and of the thirty fastest growing occupations in America, half require at least a 4–year college degree (The White House, Office of the Press Secretary, 2011). Rising levels of education are critical to creating shared economic growth (The White House, Office of the Press Secretary, 2011).

America’s economic future depends on students receiving a high–quality education. Our nation’s economic competitiveness and the path to the American dream depend on providing every child with an education that will enable them to succeed in a global economy that is grounded on knowledge and innovation (The White House, Issues, 2011). The challenge is the emergence of a global and highly competitive new knowledge–based economy, which requires enormous numbers of workers with education and training beyond high school. A student’s ability will become more important than ever. What students know and are able to do—their ability to analyze complex issues, communicate effectively, and contribute to the welfare of society—has never been more important (Hunt, 2006). Today's students will enter a job market that values skills and abilities far different from the traditional workplace of the past. Students must be able to collect, synthesize, and analyze information, then conduct targeted research and work with others to employ that newfound knowledge. In essence, students must learn how to learn, while responding to endlessly changing technologies and social, economic, and global conditions (Darling–Hammond et al., 2008).
As our economy calls for improved employment skills, educational institutions must provide quality teaching to prepare students for success. Many researchers (Marzano, 2003; Medley & Mitzel, 1963; Sanders & Horn, 1994) indicated that one of the most prominent factors in student achievement is teacher quality. Andrews, Garrison, and Magnusson (1996) noted that “excellence in teaching is complex and difficult to achieve. It is about content expertise and methodological technique, as well as about participants in the educational enterprise valuing and achieving quality outcomes” (p. 101). Past research has identified characteristics of excellent post-secondary teaching (Feldman, 1989; Hativa, Barak, & Simhi, 2001; Lowman, 1996; Rosenshine & Furst, 1971).

Exemplary teachers possess universal effective teaching characteristics (Havita, Barak, & Simhi, 2001; Lowman, 1996). “Exemplary teachers are those who are likely to promote unusually high levels of learning in their students, while also creating the positive memories of learning that come to our minds years later in moments of reflection” (Lowman, 1996, p. 39). Chickering and Gamson (1987) provided a framework of good practice for higher education institutions. The framework described seven principles of good practices: (a) encourages student faculty contact, (b) encourages cooperation among students, (c) encourages active learning, (d) gives prompt feedback, (e) emphasizes time on task, (f) communicates high expectations, and (g) respects diverse talents and ways of learning.

Effective teaching begins with the development of a teaching philosophy, a representation of the personal theory that educators construct to guide student learning (Schonwetter, Sokal, Friesen, & Taylor, 2002). Teaching philosophy statements can be defined as written statements narrating the teacher’s beliefs and theories about teaching and student learning (Fitzmaurice & Coughlan, 2007). “By writing explicit teaching philosophies, teachers can understand why they teach the way they do and the goals and beliefs that underpin their practice” (Fitzmaurice & Coughlan, 2007, p. 40). However, the search for the attributes, dispositions, knowledge, and instructional skills that define effective teachers continues as scholars seek to discover the teacher variables that can be connected to an increase in student achievement. A potential starting point would be to identify, describe, and categorize the significant themes in the philosophy statements of award winning professors, by doing so, a sense of the philosophical foundations of an excellent teacher will develop.

The 2011–2015 National Research Agenda established by the American Association of Agricultural Education address six research priorities (Doerfert, 2011). Based on these six areas of concern the focus turns to producing a learning environment where all students are engaged and are able to contextualize technical material (Doerfert, 2011). The collaborative implementation of each critical area is subject to the conveyance of material through effective instructors (Doerfert, 2011).

Theoretical Foundation and Conceptual Framework

The theoretical foundation of the study was in Mitzel’s (1960) theory on teaching and learning and Bandura’s (1977) Self Efficacy Theory. Mitzel (1960) contended that the teaching and learning process concentrations include presage variables, context variables, process variables, and product variables. Presage variables were defined as teacher characteristics. Context variables are student characteristics, and process variables reflect classroom activities. Product variables describe the outcomes of teaching. Presage variables concern traits that teachers have that affect the teaching process (Clark & Peterson, 1986; Dunkin & Biddle, 1974). These are presumed to characterize the individual teachers because they carry these attributes within themselves (Dunkin & Biddle, 1974). According to Mitzel (1960), presage variables and context variables determine the significance of process variables. The interaction of presage, context, and process variables determine the resultant process variables.

Bandura’s (1977) Social Cognitive Theory indicates that human achievement is shaped by the interaction of three variables: behavior, personal factors, and environmental factors. The
social cognition theory assumption of behavioral change is the environment provides the cognitive representations that influence a person’s behavior. Personal factors are self–beliefs that facilitate a regulatory measure of control about the behavior. The agentic supposition of this behavioral change is that people can participate in their own development. Grounded in Bandura’s Social Cognitive Theory is the Teacher Self–Efficacy theory. Bandura stated, self–efficacy beliefs influence the choices and goals people make, the amount of effort they apply toward these goals, how long they persevere at a task in times of failure or difficulty, and the amount of stress that is experienced (Frederickson & Turner, 2003).

This theory provides a basis to further understand needs and behaviors of teachers to include their beliefs toward teaching and learning. The interaction of these two theories can explain the outcomes of this study. In effect, teacher characteristics and beliefs espoused in philosophy statements are presage variables which impact behavior and the learning environment. In an analogous comparison Mitzel’s presage variables mirrors Bandura’s social cognition theory assumption of behavioral change and teacher self–efficacy based on ingrained teacher behavior and approach. The conceptual framework for the study is illustrated in Figure 1.

Stage of Current Study

Stage 1

Presage Variables

Significant Theme

Significant Theme

Significant Theme

Significant Theme

Scholarship of Teaching and Learning

Practitioners

Philosophy of Teaching

Stage 2

Significant Theme

Significant Theme

Classroom Practice

Stage 3

Student Learning

Figure 1. Conceptual Framework

In the current stage of the research study, Stage 1, significant themes in the teaching philosophy statements of award–winning professors were identified. The findings will then facilitate Stage 2 and Stage 3 for future research to focus on determining if a disconnect exists between the stated teaching philosophy of award winning professors and their actual teaching practice and to analyze the classroom practice of award winning professors and the impact had on student learning.

Purpose of the Study

The purpose of the descriptive study was to identify emergent themes present in the teaching
philosophy statements of the United States Department of Agriculture Excellence in College and University Teaching in the Food and Agricultural Sciences award recipients. To accomplish that purpose, the following research objectives guided the study:

1. Identify the biographical, educational background, and professional experience profile of award recipients from 2000 – 2010.
2. Identify via content analysis emergent themes in the espoused philosophy statements of award recipients.
3. Describe frequency of emergent themes identified in the teaching philosophy statements of the award recipients.

**Methods**

The participants of the study were the national/regional award winners of the United States Department of Agriculture’s (USDA) National Awards Program for Excellence in College and University Teaching in the Food and Agricultural Sciences from the years 2000 – 2010. A census of 110 recipients was used. The participants were listed on the USDA National Awards Program for Excellence in College and University Teaching in the Food and Agricultural Sciences webpage.

*Description of Population Selection Process*

The 110 award recipients of the USDA National Awards Program for Excellence in College and University Teaching in the Food and Agricultural Sciences from the years 2000 – 2010 was the population frame for the research study. The USDA National Awards Program for Excellence in College and University Teaching in the Food and Agricultural Sciences is offered annually to identify and honor faculty who uphold excellent teaching, with the goal of giving national attention to the role of teaching in colleges and universities in the Food and Agricultural Sciences. Recipients must have exhibited continual, commendable and excellent teaching at the postsecondary level within the food and agricultural sciences (United States Department of Agriculture, 2010).

The awards program requires interested nominees submit a nomination packet. The primary component of that package is a written response to six Evaluation Criteria categories. The categories include: (a) Teaching Quality Assessment, (b) Philosophy of Teaching and Teaching Methodology, (c) Service to the Teaching Profession and the Scholarship of Teaching, (d) Service to Students, (e) Professional Growth and Competencies Development, and (f) Endorsement by Administrator, Alumnus, and Colleague. Under strict guidelines, the packets are evaluated by a panel of experts consisting of a combination of university faculty and administrators, public school teachers or administrators, representatives from professional associations, and personnel from other federal agencies (USDA, 2010).

*Content Analysis Process*

To analyze the teaching philosophy statements, content analysis was used. Content analysis is a technique that enables researchers to study human behavior in an indirect way, through an analysis of their communications (Fraenkel & Wallen, 2009).

A conventional qualitative content analysis approach was used while utilizing a constant comparative strategy between the philosophy statements. Themes emerged both from the data (an inductive approach) and from the investigator’s prior theoretical understanding of the phenomenon under study (an *a priori* approach). Researchers identified and quantified the presence of words and concepts that represent emergent themes within the teaching philosophy statements.

The process of qualitative content analysis often begins during the early stages of data collection. Qualitative content analysis involves a set of systematic and distinct procedures for processing data. The steps are listed and described below.

1. **Identify a population of documents/arrange data for qualitative content analysis**

The population of documents was the teaching philosophy statements of the United States Department of Agriculture Excellence in College and University Teaching in the Food
and Agricultural Sciences award recipients from the years 2000 – 2010. A written teaching philosophy statement was a requirement of the award program evaluation criteria for applicants to receive the award. The award winning teaching philosophy statements were submitted in a word document, which was an appropriate format for analysis.

2. **Determine the unit of analysis**
   Each philosophy statement was the unit of analysis. Each statement was coded for themes which may be expressed in single words, phrases, sentences, paragraphs, or entire documents. The researcher primarily looked for the expression of an idea. Codes were assigned to any length of text, any size, as long as a theme of interest was present.

3. **Select a sample of units from the population**
   A census of all the philosophy statements from the award recipients from the years 2000 – 2010 were selected to be analyzed.

4. **Design coding procedures: develop categories and coding scheme**
   In traditional content analysis, categories are required to be clearly defined, comprehensive, and mutually–exclusive. The categories were established following some preliminary examination of the data. First, the principal researcher independently reviewed the material and developed a set of themes that formed a checklist of themes. Second, two qualified coders read through ten randomly selected statements and compared notes and reconciled any differences that showed up on their initial checklists. Third, the researchers used a consolidated checklist to independently apply coding. Fourth, the researchers checked the reliability of the coding (a 95% agreement is suggested; .8 for Cohen's kappa). If the level of reliability was not acceptable, then the researchers repeated the previous steps. Once the reliability was established, the coding was applied on a large–scale basis. The final stage was a periodic quality control check.

5. **Code all text**
   When sufficient consistency had been achieved, the coding rules were applied to code all text. During the coding process, researchers checked the coding constantly to prevent “drifting into idiosyncratic sense of what the codes mean” (Schilling, 2006).

6. **Reporting**
   For the current stage of the study, the themes that emerged from the content analysis were described and reported.

   A quantitative content analysis approach was used to determine the frequency at which the themes occurred throughout the population of documents. This was accomplished by establishing a spreadsheet in SPSS that ran frequency counts on the themes throughout all the documents analyzed. Analyses of word–counts yield inferences about the frequency of themes in texts. The word count does not imply importance; merely frequencies.

**Survey Approach**

A modified Dillman approach to social science research was utilized. Participants were contacted by email. The email informed participants of the study’s purpose and objectives as well and included an implied consent form. The participants were asked to submit the philosophy of teaching statement they previously submitted to the USDA National Awards Program for Excellence in College and University Teaching in the Food and Agricultural Sciences. The participants who agreed to participate in the study; sent a copy of their philosophy statement and completed an online demographic survey. The philosophy statement was collected from award recipients as an attached word document sent in a reply email.

As the philosophy statements were submitted, each philosophy statement was numbered. A modified Dillman approach was used for initial contact and follow–up reminders to non–respondents. Award recipients who did not reply within two weeks were sent an email reminder. Altogether, as many as four contacts were made, three of which were by email, over a period of one month. A fourth and final contact was made by phone to those award recipients who had not responded to any of the previous three emails. For the participants who were unable to locate their original, award winning philosophy statement, the individuals were asked to send an email granting approval for the researcher to have the philosophy statement released from the United States Department of Agriculture, Division of Community and
Education, the office in which the award applications are received during the award application process and housed after award winners are selected. Reminder emails were sent out to non–respondents two weeks and four weeks post the initial introduction and recruitment email. Using the process a total of 86 philosophy statements were obtained, which is 78.2 percent of the target population.

Included in the emails to the participants was a link to an online demographic survey facilitated through SurveyMonkey©. The survey was reviewed by a panel of experts for face and content validity. The demographic survey was twelve demographic questions in length. Sixty four (n = 64) award winners elected to participate in completing the online demographic survey, for an overall response rate of 58.2 percent.

Reliability and Validity
To establish inter–coder reliability, ten philosophy statements were selected at random using a random number generator. The numbers that were assigned previously to the philosophy statements were used. Two researchers and the principal researcher were used to establish inter–coder reliability. All coders received the same text units to code. The following steps were followed:

Step one: the principal researcher read through all 86 philosophy statements and identified 13 emergent themes. The principal researcher developed a set of themes that formed a checklist of themes. Each of the 13 themes was defined and a codebook was developed. The codebook contained instructions on how the themes were identified and instructions for future coders to follow. The 13 emergent themes were then listed with definitions. A coding sheet was also attached for two outside coders to use for coding purposes.

Step two: two outside coders then read through ten randomly selected philosophy statements. If any of the thirteen emergent themes was identified during reading, the corresponding box was checked on the coding sheet. Each philosophy statement could have had up to thirteen checked themes.

Step three: the researchers compared notes and reconciled any differences that showed up on their initial codes and themes checklists.

Step four: the researchers used a consolidated checklist to independently apply coding.

Step five: the researchers checked the reliability of the coding (a priori set at a 90% agreement; .8 for Cohen's kappa). A Cohen’s kappa percentage of agreement was calculated. “Cohen’s kappa assumes nominal–level data and has a typical range from .00 (agreement at chance level) to 1.00 (perfect agreement), and a value of less than 0.00 indicates agreement less than chance” (Neuendorf, 2002, p. 150).

If the level of reliability was not acceptable, then the researchers repeated the previous steps. Once the reliability was established, the coding was applied on a large–scale basis. A periodic quality control check was followed.

Validity and reliability was established through three rounds. Round one consisted of the principal researcher reading through all 86 philosophy statements and identifying 13 emergent themes. The themes included: facilitator; present subject matter in multiple modalities; build personal relationships with each student; create a safe, intellectually stimulating learning environment; reflection; enthusiasm; expert in subject matter; role model; organization and clarity; professionalism; provide opportunity to learn; technological integration; and excellent researchers. The 13 themes were defined and organized in a codebook and coding sheet for inter–coder reliability to occur. Inter–coder reliability was conducted with two other researchers.

Upon completion of inter–coder reliability, all three researchers then compared results and notes. After lengthy discussion and review, several of the themes were renamed and definitions were refined for explicitness and clarity. One predetermined theme, excellent researchers, was eliminated, as it was agreed upon by all three researchers it was not emergent. Two themes, professionalism and reflection, were collapsed into one theme due to overlap in definition which was renamed, professional teaching commitment, and re–defined. The first round of reliability ended with 11 emergent themes and explicit definitions of
each, which included: student centeredness; instructional variability; student rapport; conducive learning environment; professional teaching commitment; enthusiasm; expert in subject matter; role model; organization and clarity; provide opportunity to learn; and technological integration. A percentage agreement and a Cohen’s kappa were calculated.

Round two of validity and reliability was conducted after a calculated percentage agreement and Cohen’s Kappa for inter-coder reliability was not desirable. Ten new philosophy statements were selected using a random number generator and each researcher read through and coded each statement. Again, identified theme definitions were expanded upon for clarity and agreement. Three steps were established for identifying themes during coding. Step 1 was to read content. Step 2 was to identify key words relating back to codebook. Step 3 was to establish theme and assign. A percentage agreement and a Cohen’s Kappa were calculated for each theme, which was still less than desirable. A third round of reliability was conducted.

Round three of validity and reliability was conducted. Ten randomly selected philosophy statements were distributed to each researcher. Each researcher read and coded the statements, using the three steps established in round two of validity and reliability. A final review of the results and calculations of percentage agreement and Cohen’s Kappa for each theme established the findings to be valid and reliable.

Percentage agreement was calculated between the principal researcher and each individual researcher/coder that assisted in the reliability and validity rounds for each theme. The percentage agreement was calculated for each theme between the principal researcher and researcher/coder 1, between principal researcher and researcher/coder 2, and between researcher/coder 1 and researcher/coder 2. The number of ratings for each theme was added respectively to the individual the agreement was being calculated between. The number each researcher could have had was between one and ten. The two numbers were added and divided by two. An overall average of the percentage agreement was then calculated.

Table 1 and Table 2 illustrate The Percentage Agreement and Cohen’s Kappa values for each of the three rounds of validity and reliability.

Limitations

Limitations of the study of conducting a content analysis occurred in the obtainment of the teaching philosophy statements. There were 110 recipients from 2000–2010. Mortality was a factor in obtaining the 110 documents. One recipient of the teaching award had passed away. Another limitation in obtaining the philosophy statement was the unfortunate computer crash experienced by several award recipients and having lost and not recovered the original submitted teaching philosophy statement. Some were recovered through working with the USDA program coordinator, but not all. In content analysis the researcher should try to have some sort of validation study built into the design. In qualitative research, validation takes the form of triangulation. Triangulation lends credibility to the findings by incorporating multiple sources of data, methods, investigators, or theories (Erlandson, Harris, Skipper, & Allen, 1993). With the study that was conducted, triangulation was a major limitation. Triangulation was a limitation due to lack of funding.
Table 1
Percentage Agreement and Cohen’s kappa Statistic for Reliability in Nominal Theme Identification from Expert Panel in Round I

<table>
<thead>
<tr>
<th>Identified Themes</th>
<th>Percentage Agreement</th>
<th>Cohen’s kappa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Facilitator</td>
<td>.87</td>
<td>1.00</td>
</tr>
<tr>
<td>2. Present subject matter in multiple modalities</td>
<td>.73</td>
<td>1.00</td>
</tr>
<tr>
<td>3. Build personal relationships with each student</td>
<td>.80</td>
<td>-1.15</td>
</tr>
<tr>
<td>4. Create a safe, intellectually stimulating learning environment</td>
<td>.63</td>
<td>.31</td>
</tr>
<tr>
<td>5. Reflection</td>
<td>.60</td>
<td>-.17</td>
</tr>
<tr>
<td>6. Enthusiasm</td>
<td>.87</td>
<td>.78</td>
</tr>
<tr>
<td>7. Expert in subject matter</td>
<td>.60</td>
<td>0.00</td>
</tr>
<tr>
<td>8. Role model</td>
<td>.73</td>
<td>.40</td>
</tr>
<tr>
<td>9. Organization and Clarity</td>
<td>.73</td>
<td>.40</td>
</tr>
<tr>
<td>10. Professionalism</td>
<td>.67</td>
<td>.20</td>
</tr>
<tr>
<td>11. Provide opportunity to learn</td>
<td>.67</td>
<td>0.00</td>
</tr>
<tr>
<td>12. Technological integration</td>
<td>.87</td>
<td>.78</td>
</tr>
<tr>
<td>13. Excellent Researcher</td>
<td>.60</td>
<td>-.17</td>
</tr>
</tbody>
</table>

Note. Cohen’s kappa of 1.0 is perfect reliability; R1= Researcher One; R2=Researcher Two; R3= Researcher Three
Table 2

*Percentage Agreement and Cohen’s kappa Statistic for Reliability in Nominal Theme Identification from Expert Panel in Rounds II and III*

<table>
<thead>
<tr>
<th>Identified Theme</th>
<th>Percentage Agreement</th>
<th>Cohen’s kappa</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Round II</td>
<td>Round III</td>
</tr>
<tr>
<td>1. Student Centeredness</td>
<td>.80</td>
<td>1.00</td>
</tr>
<tr>
<td>2. Instructional Variability</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>3. Student Rapport</td>
<td>.87</td>
<td>1.00</td>
</tr>
<tr>
<td>4. Conducive Learning Environment</td>
<td>.80</td>
<td>.93</td>
</tr>
<tr>
<td>5. Professional Teaching Commitment</td>
<td>.67</td>
<td>.93</td>
</tr>
<tr>
<td>6. Enthusiasm</td>
<td>.83</td>
<td>1.00</td>
</tr>
<tr>
<td>7. Expert in Subject Matter</td>
<td>.93</td>
<td>.93</td>
</tr>
<tr>
<td>8. Role Model</td>
<td>.80</td>
<td>1.00</td>
</tr>
<tr>
<td>9. Organization and Clarity</td>
<td>.80</td>
<td>.93</td>
</tr>
<tr>
<td>10. Provide Opportunity to Learn</td>
<td>.73</td>
<td>.93</td>
</tr>
<tr>
<td>11. Technological Integration</td>
<td>.80</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Findings

Research objective one was to provide a profile of the award recipients in terms of their biographical, educational and professional experiences. A total of 110 award recipients were contacted to submit their philosophy statement and complete the online demographic survey. Sixty four (n = 64) award winners elected to participate in completing the online demographic survey, for an overall response rate of 58.2%. The following results provide a profile of the award recipients in terms of their biographical, educational and professional experiences. Respondents were 71.4% (n = 45) male and 28.6% were female. One respondent did not provide a response. Of the sixty four total respondents, sixty three provided a response to the age bracket of which they belonged; 30.2% (n = 19) were between the ages 51 – 60, 28.6% (n = 18) were 61 years of age or older, 27.0% (n = 17) were between the ages of 41 – 50, and 14.3% (n = 9) were between the ages of 31 – 40 years old. The ethnic profile of fifty–nine respondents was as follows: 91.5% (n = 54) were white, 3.4% (n = 2) were black and 5.1% (n=3) were Asian, five respondents did not provide a response (see Table 3).

Respondents’ professional rank were as follows: 78.1% (n = 50) held the professional rank of Full Professor, 17.2% (n = 11) were Associate Professor, 1.6% (n = 1) were Assistant Professor, 1.6% (n = 1) was an Instructor/Lecturer, and 6.3% (n = 4) selected “Other” for their current professional rank (see Table 4).

Sixty three respondents provided the number of undergraduate courses taught, which averaged to be 3.05 per year. One respondent did not provide a response. All sixty four respondents provided the number of graduate courses taught, which averaged to be 1.63 per year.

Sixty one respondents provided their current appointment by percentage of time. It was found that 14.7% (n = 9) respondents held a teaching appointment between 5 – 25%. Twenty three respondents, 34.4%, held a teaching appointment between 26 – 50%. A total of 27.8% (n = 17) of the respondents held a 51 – 75% teaching appointment. Finally, 19.6% (n = 12) of the respondents held a 76 – 100% teaching appointment (see Table 5).

Respondents were asked to provide the number of years with teaching experience. The average years of teaching experience was 24.3 years for sixty three respondents. The recipients taught in fifteen different disciplines. Table 6 illustrates the disciplines.

<table>
<thead>
<tr>
<th>Gender (n = 63)</th>
<th>Number of Respondents</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>45</td>
<td>71.4%</td>
</tr>
<tr>
<td>Female</td>
<td>18</td>
<td>28.6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age (n = 63)</th>
<th>Number of Respondents</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 – 40 years old</td>
<td>9</td>
<td>14.3%</td>
</tr>
<tr>
<td>41 – 50 years old</td>
<td>17</td>
<td>27.0%</td>
</tr>
<tr>
<td>51 – 60 years old</td>
<td>19</td>
<td>30.2%</td>
</tr>
<tr>
<td>61 years or older</td>
<td>18</td>
<td>28.6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ethnic profile (n = 59)</th>
<th>Number of Respondents</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>54</td>
<td>91.5%</td>
</tr>
<tr>
<td>Asian</td>
<td>3</td>
<td>5.1%</td>
</tr>
<tr>
<td>Black</td>
<td>2</td>
<td>3.4%</td>
</tr>
</tbody>
</table>
Table 4
*Professional Rank of Demographic Survey Respondents*

<table>
<thead>
<tr>
<th>Professional Rank</th>
<th>Percent (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Professor</td>
<td>78.1% (n = 50)</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>17.2% (n = 11)</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>1.6% (n = 1)</td>
</tr>
<tr>
<td>Instructor/Lecturer</td>
<td>1.6% (n = 1)</td>
</tr>
<tr>
<td>Other</td>
<td>6.3% (n = 4)</td>
</tr>
</tbody>
</table>

Table 5
*Current Teaching Appointment by Percentage Time of the Demographic Survey Respondents*

<table>
<thead>
<tr>
<th>Current Teaching Appointment by Percentage of Time</th>
<th>Percent (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–25% Teaching Appointment</td>
<td>14.7% (n = 9)</td>
</tr>
<tr>
<td>26–50% Teaching Appointment</td>
<td>34.4% (n = 23)</td>
</tr>
<tr>
<td>51–75% Teaching Appointment</td>
<td>27.8% (n = 17)</td>
</tr>
<tr>
<td>76–100% Teaching Appointment</td>
<td>19.6% (n = 12)</td>
</tr>
</tbody>
</table>

Table 6
*Disciplines Taught by Award Recipients*

<table>
<thead>
<tr>
<th>Discipline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Communications</td>
</tr>
<tr>
<td>Agricultural Economics</td>
</tr>
<tr>
<td>Agricultural Engineering</td>
</tr>
<tr>
<td>Agricultural and Extension Education</td>
</tr>
<tr>
<td>Agriculture and Home Economics/Family and Consumer Sciences</td>
</tr>
<tr>
<td>Agricultural Law</td>
</tr>
<tr>
<td>Agronomy</td>
</tr>
<tr>
<td>Animal Science</td>
</tr>
<tr>
<td>Entomology</td>
</tr>
<tr>
<td>Food Science/Meat Science/Nutrition</td>
</tr>
<tr>
<td>Forestry</td>
</tr>
<tr>
<td>Horticulture</td>
</tr>
<tr>
<td>Plant and Soil Science</td>
</tr>
<tr>
<td>Sociology</td>
</tr>
<tr>
<td>Wildlife and Fishery Science/Natural Resource Management</td>
</tr>
</tbody>
</table>

Research objective two was to identify the emergent themes found in the espoused philosophy statements through content analysis. A total of 110 award recipients were contacted to submit their philosophy statement. Eighty six (n = 86) award winners elected to participate in the study by providing their teaching philosophy statement, for an overall response rate of 78.2%.

At the completion of the validity and reliability stages of the study, eleven emergent themes were identified and operationally defined. The eleven emergent themes and their operational definitions are organized in Table 7. The operational definitions consist of key words and phrases that explicitly and clearly illustrate the theme. The key words and phrases feature the
voice of the recipients by using the words they chose in their writing and by citing sentences and paragraphs as illustrative of a theme. The definitions were included in the codebook to help the researchers during coding for reliability to focus on identifying themes in respect to this study and only this study.

Table 7
Identified Emergent Themes and Definitions

<table>
<thead>
<tr>
<th>Identified Theme</th>
<th>Operational Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Student Centeredness</td>
<td>encourage collaboration; develop lifelong learners; help students learn to be learners; a desired outcome of students is developing skills for future and career success; empowering students to think and solve problems; refining students’ skills in communication, critical thinking and problem solving; analyze, synthesize, apply and evaluate; provoke student reflective thinking; provide intellectual rigor; create enduring understanding</td>
</tr>
<tr>
<td>2. Instructional Variability</td>
<td>recognizes and addresses different learning styles of all students; variability; employing various teaching tactics; create learning activities; maximize student learning</td>
</tr>
<tr>
<td>3. Build Student Rapport</td>
<td>maintain a level of mutual respect between themselves and the students; effort put into learning the student as an individual; concern for student welfare; enjoy students; relate to students; identify each individual students’ strength and weaknesses; accessible; empathize; rewarding students; listening; time and interest given to students; approachable</td>
</tr>
<tr>
<td>4. Conducive Learning Environment</td>
<td>safe, intellectually stimulating; positive classroom environment; welcoming; conducive to learning; comfortable</td>
</tr>
<tr>
<td>5. Professional Teaching Commitment</td>
<td>engage in activity to improve their teaching; constant improvement of teaching; be progressive; stay current in instructional and laboratory teaching methods; collaborate with peers; continually update pedagogical knowledge; constantly assess; personal reflection; professional development; purposeful attention to detail on class materials and instruction; methodical; appropriate self-presentation in appearance and speech; honest; businesslike behavior; personal commitment to teaching</td>
</tr>
<tr>
<td>6. Enthusiasm</td>
<td>create interest and excitement; passion for subject matter; personality; fun; enjoyable; entertaining</td>
</tr>
<tr>
<td>7. Expert in Subject Matter</td>
<td>provide foundational facts and information; acquisition of knowledge and content material; keep course content current; master of subject matter; incorporates current research in instruction; strength in Pedagogical Content Knowledge</td>
</tr>
<tr>
<td>8. Role Model</td>
<td>positive impact; motivating; mentor; challenge students; inspire; encourage; provide time and attention to students; approachable; high expectations; “make a difference”; personal dignity; dedicated; high personal and professional integrity</td>
</tr>
<tr>
<td>9. Organization and Clarity</td>
<td>clearly stated learning objectives/goals; effective planning; uses effective principles of instructional design; structured learning; detailed instruction, materials, and activities; clear communication</td>
</tr>
<tr>
<td>10. Provide Opportunity to Learn</td>
<td>provide opportunities inside and outside of classroom for student success; stimulate ownership and responsibility in learning; enforce accountability; students show what they know; provide informal and/or formal feedback on student progress; informal and/or formal assessment; unique assignments and utilize student research projects</td>
</tr>
<tr>
<td>11. Technological Integration</td>
<td>incorporate technology into courses; use of various communications</td>
</tr>
</tbody>
</table>
technology and delivery mechanisms; up to date on educational technologies

The third research objective was to summarize the frequency of themes identified. Eleven themes emerged from the teaching philosophy statements. Table 8 exhibits the eleven themes and the frequency at which they occurred throughout the 86 teaching philosophy statements obtained for the research study. The three emergent themes that were the most common were student centeredness provides opportunity to learn, and a tie for the third most commonly occurring theme was instructional variability and expert in subject matter. The three emergent themes that were the least common were conducive learning environment, organization and clarity, and technological integration.

Table 8

<table>
<thead>
<tr>
<th>Emergent Theme</th>
<th>Number of Philosophy Statements Analyzed</th>
<th>Number of Philosophy Statements with Theme</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Student Centeredness</td>
<td>86</td>
<td>81</td>
<td>94.2%</td>
</tr>
<tr>
<td>2. Instructional Variability</td>
<td>86</td>
<td>66</td>
<td>76.7%</td>
</tr>
<tr>
<td>3. Build Student Rapport</td>
<td>86</td>
<td>63</td>
<td>73.3%</td>
</tr>
<tr>
<td>4. Conducive Learning Environment</td>
<td>86</td>
<td>40</td>
<td>46.5%</td>
</tr>
<tr>
<td>5. Professional Teaching Commitment</td>
<td>86</td>
<td>63</td>
<td>73.3%</td>
</tr>
<tr>
<td>6. Enthusiasm</td>
<td>86</td>
<td>61</td>
<td>71.0%</td>
</tr>
<tr>
<td>7. Expert in Subject Matter</td>
<td>86</td>
<td>66</td>
<td>76.7%</td>
</tr>
<tr>
<td>8. Role Model</td>
<td>86</td>
<td>57</td>
<td>66.3%</td>
</tr>
<tr>
<td>9. Organization and Clarity</td>
<td>86</td>
<td>44</td>
<td>51.2%</td>
</tr>
<tr>
<td>10. Provide Opportunity to Learn</td>
<td>86</td>
<td>70</td>
<td>81.4%</td>
</tr>
<tr>
<td>11. Technological Integration</td>
<td>86</td>
<td>48</td>
<td>55.8%</td>
</tr>
</tbody>
</table>

Conclusions

The purpose of the descriptive research was to identify emergent themes present in the teaching philosophy statements of the USDA Excellence in College and University Teaching in the Food and Agricultural Sciences award recipients. The biographical, educational background and professional experience (research objective one) was collected from an online demographic survey. Award recipients are uniform and monocultural in regards to ethnicity, gender, age and experience. The researcher acknowledges that the demographic survey presents current characteristics of the 2000–2010 award recipients as opposed to the demographics when award winners received the award.

Research objective two was to identify via content analysis emergent themes in the espoused philosophy statements of award recipients. Eleven emergent themes were identified and operationally defined. The eleven
themes include: Student Centeredness, Instructional Variability, Build Student Rapport, Conducive Learning Environment, Professional Teaching Commitment, Enthusiasm, Expert in Subject Matter, Role Model, Organization and Clarity, Provide Opportunity to Learn, and Technological Integration.

The frequency at which they occurred throughout the 86 teaching philosophy statements obtained for the research study was calculated (research objective three). The three emergent themes that were the most common were student centeredness, provide opportunity to learn, and a tie for the third most common theme was expert in subject matter and instructional variability. The three emergent themes that were the least common were a conducive learning environment, organization and clarity, and technological integration.

Implications

In a 2003–04 report released by the National Center for Education Statistics, teaching faculty in the career teaching field of Agriculture and Natural Resources were profiled. The demographic survey found the typical faculty population to be 78.1% male, 90.3% white, with an average age of 49.8 (National Center for Education Statistics, 2004). The question must be raised regarding whether or not the award recipient profile is congruent with the current faculty demographic profile in colleges of agriculture. The question is: are all demographic groups being represented equally? If not, why? There is also an implication that teaching excellence awards generally come later in a professor’s career.

Fitzmaurice and Coughlan (2007) stressed the importance of post-secondary teachers to examine their beliefs and attitudes to formulate a concept of higher education that goes beyond classroom competency and emphasizes teaching both as a pedagogical and moral activity. The eleven emergent themes exemplify traits that encompass excellent teaching and effective teaching characteristics. There is concern that while keywords may be used in a philosophy statement to indicate a theme, could the instructor identify that concept in action? For example, would all professors know student-centeredness when they saw it and have a similar operational definition of the concept?

All eleven emergent themes are found to be characteristics of excellent teachers. If teaching faculty members are not espousing certain themes in their philosophy statement, then there is a possibility they are not practicing such characteristics in the classroom. A healthy combination of all themes in a classroom will promote student learning and in essence overall student achievement. If a teacher lacks any of the characteristics, student achievement could be affected. Each theme illustrates specific behaviors instructors can adopt to better the teaching and learning experience. There is a possibility that the professional development received in instructional practice could impact what themes are emphasized in the philosophy statements.

Recommendations for Future Research

Award program managers should make every effort to ensure that under-represented populations are aware of the award program and are provided the professional development necessary to complete the application process. Further research is recommended for a comparison of demographic profile of award winners to college of agriculture faculty profiles to university faculty profiles to general population demographic profiles. Additionally, further research is recommended to investigate reasons for those discrepancies identified. Research studies contribute to understanding the perceived attributes of excellent teachers, however, they have had limited influence on improving the practice of less experienced university teachers. Identifying the elements of excellent university teaching has not shed light on how university teachers develop these attributes. Future research should investigate the characteristics of award winning teaching faculty and use these findings to address teaching development needs of less experienced or novice teaching faculty.

Further research should be conducted to inventory what professional development is provided to faculty members in colleges of agriculture across the nation. Once the amount of a professional development is determined,
research should be conducted to provide empirical evidence to the professional development format and topic that provides the greatest gains in student achievement. The need for developing metrics to measure student gains and/or outcomes, while common in secondary education, is rapidly advancing to post-secondary education. How can student success be determined?

Additionally, there is a possibility of a disconnect between espoused philosophy and actual practices. Thus, research is recommended to create methods to measure the effective teaching characteristics in classroom practice. By capturing the teacher in action of how they are carrying out their espoused teaching philosophy, professional development personnel on college campuses could develop teaching improvement workshops, seminars, and in-services to teaching faculty based on effective teaching practices and how to implement them into one’s teaching. Roche and Marsh (2000) purport that researchers and practitioners agree that teaching is complex and consists of multiple dimensions. Future research must pay more attention to the complexity of teaching when attempting to further our understanding of university–level teaching. Often times, research universities expect faculty members to produce and disseminate research, which means that they are not often trained in effective instruction. The concern lies with supporting those new faculty members who strive to become excellent teachers. The importance of understanding how teaching faculty learn to teach and the examination of what teachers say and what they do in the university classroom will help develop research that can lead to improved and quality teaching at the post–secondary level.

References


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The Influence of School Culture on Environmental Education Integration: A Case Study of an Urban Private School System

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South Jackson Elementary School
Nicholas E. Fuhrman, Assistant Professor
Dennis W. Duncan, Associate Professor and Interim Department Head
University of Georgia

As a discipline, environmental education (EE) has been criticized for lacking empirical evidence on the behavioral outcomes of its programs. While the behavioral outcomes of EE activities are often associated with the youth learner, teachers are one target audience of EE training programs who have received increasing attention with regards to behavior change. Previous research has identified numerous barriers to teaching EE in the classroom. Barriers include a lack of natural spaces to conduct EE activities, little administrative support, limited time, and lack of teacher comfort and confidence with science. The purpose of this qualitative case study was to understand how Trinity School’s culture has influenced EE integration. A number of domains emerged from the data regarding characteristics of the school which have influenced EE integration, including: administration, freedom in curriculum and exploration, and collaboration among teachers. A series of domains also emerged regarding barriers to teaching EE, including: comfort, lack of time, lack of interest among teachers, politics, and dangers and safety concerns.

Keywords: environmental education; curriculum integration; teacher efficacy; school culture

Introduction/Theoretical Framework

Environmental education (EE) seeks to move participants from awareness to pro–environmental action (Brewer, 2001; Hudson, 2001; Jacobson, 1999). However, as a discipline, EE has been criticized for lacking empirical evidence on the behavioral outcomes of its programs (Dierking, Burtyny, Buchner, & Falk, 2002; Leeming, Dwyer, Porter, & Cobern, 1993; Swanagan, 2000). While the behavioral outcomes of EE activities are often associated with the youth learner, teachers are one target audience of EE training programs who have received increasing attention with regards to behavior change. Most notably, the intended behavior change of EE trainings aimed at teachers has been the adoption of EE curricula in the classroom.

As outlined in the National Research Agenda for Agricultural Education (Doerfert, 2011), Research Priority Areas 4 and 5 focus on efficient and effective programs that offer meaningful, engaged learning in all environments. Specifically, the discipline is called to examine the impact of various environments on learning outcomes and define the characteristics of effective programs and teachers. Environmental education curriculum resources encourage experiential learning in an array of indoor and outdoor environments and complement existing agricultural education curricula. A well–prepared student must have hands–on learning opportunities in EE in order to understand the impacts (positive and negative) that agriculture has on the environment and how they can play a role in educating others about the importance of being
good stewards of the land. This study contributes to the National Research Agenda by helping to define the characteristics of one particularly effective program and its teachers.

Many university pre-service teacher education programs work to build an awareness of the EE curricula available to new teachers (such as Project Learning Tree, Project WILD, and Project WET) in hopes of enhancing their confidence to integrate EE activities in their classroom teaching. In fact, pre-service teachers who have received EE preparation are more confident in their ability to implement EE in the classroom (Lane, Wilke, Champeau, & Sivek, 1995). However, increasing knowledge of EE curricula does not necessarily guarantee the use of such curricula in the classroom (Schultz, 2002). Eleven barriers to teaching EE in the classroom were identified in a review of the literature from the past 20 years. These included lacking: (a) relevant EE materials that can be easily linked to the curriculum, (b) natural spaces to conduct EE activities, (c) administrative support, (d) time, (e) teacher comfort and confidence with science, and additional issues such as (f) safety and liability, (g) funding for equipment and other supplies, (h) class size, (i) student interest in EE, (j) integration of “taboo” environmental issues, and (k) integration of EE into the school culture. The influence of school culture was a barrier which surfaced only within the past five years and prompted this study.

The researchers postulate that a twelfth barrier should be considered when implementing and teaching EE curricula – that of teacher self-efficacy. Bandura (1977) purports that self-efficacy refers to personal beliefs about one’s capabilities to perform actions, such as teaching, at specific levels. Self-efficacy is important because efficacious teachers are more willing to try new things (Smylie, 1988), and prone to less stress (Parkay, Greenwood, Olejnik, & Prollier, 1988; Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998). Teachers with a high sense of self-efficacy face threatening (new and/or unfamiliar curriculum) situations with assurance that they can exercise control and have the power to overcome obstacles (Bandura, 1994). In addition, “teachers with a high level of efficacy believed that they could control, or at least strongly influence, student achievement and motivation” (Tschannen-Moran et al., 1998, p. 2).

In the simplest sense, schools are learning organizations. As such, organizational change theory, with an emphasis on culture, has been discussed in relation to the adoption of EE curricula, but has not been the focal point of many studies. However, much research exists on the link between school–wide change and school culture from a leadership standpoint (Stolp & Smith, 2001). Deal and Peterson (1998) advocated that unless change is meaningfully linked with a school’s culture, reform is likely to fail. Within the EE discipline, some authors refer to the adoption of EE as involving the integration of EE curricula and existing course content with an emphasis on school–wide/organization–wide change (Van Petegem, Blieck, Imbrecht, & Van Hout, 2005). Some stress the need to reform the school culture into a collaborative, partnership–oriented atmosphere as a way to successfully implement EE at the interdisciplinary level (Fullan, 1994). Dyment (2005) suggested that the changing school climate has made it difficult for teachers to engage in innovative teaching practices like those often found in EE curricula. Some of the teachers she interviewed felt that teaching outdoors was another “educational reform/fad” and did not want to spend the time learning how to implement this practice if it was also going to pass. Other studies reported barriers reflecting a hesitant culture in support of EE integration in pre-service teacher preparation programs. In fact, culture was often the most difficult constraint (Heimlich et al., 2004; Van Petegem et al., 2005). As most teacher preparation programs are housed in university academic departments, cultural barriers were often politically related (Heimlich et al., 2004; Powers, 2004). Others emphasize that for adoption of EE within schools to stick, re–culturing is needed (Van Petegem et al., 2005). This “re–culturing” may be necessary as teachers have been found to revert back to teaching the same way they were originally taught when faced with difficult teaching situations (Yilmaz–Tuzun, 2008). None the less, as additional EE curricula are published and marketed to formal and nonformal educators,
adopting such curricula will involve individual and organizational change. A need exists to understand the influence of a school’s unique culture on EE integration.

Schools may also be viewed as communities. According to Community–based Social Marketing Theory, behavior change is most effectively achieved through initiatives delivered at the community–level which focus on removing barriers while simultaneously enhancing the activity’s benefits (McKenzie–Mohr & Smith, 1999). There are six components of Community–based Social Marketing that must be addressed when attempting to generate behavior change within an organization. These include norms, incentives, commitment, communication, prompts, and the removal of external barriers. According to Community–based Social Marketing, when a school commits to implementing EE, uses prompts, communication, and incentives to remind teachers of their commitment, removes external barriers, and makes teaching EE a norm among teachers, EE integration is more likely to “stick” and become part of the school culture.

Community–based Social Marketing theory integrates elements of the aforementioned self–efficacy theory (Bandura, 1977), as well as components of the theory of planned behavior (Ajzen, 1985) and social cognitive theory (Bandura, 2002). Self–efficacy is influenced by the availability of resources used to perform a behavior, an individual’s perception of their ability to perform the behavior successfully, and that successful performance will result in a positive outcome (Haldeman & Turner, 2009). The theory of planned behavior refers to this as perceived behavioral control (Ajzen, 1985). According to social cognitive theory, an individual must believe the positive outcomes of performing a behavior outweigh the costs and that they have the skills and confidence to successfully perform the behavior. Community–based Social Marketing theory integrates these elements within a broader community context, where resource availability, ability to perform a behavior, and resulting positive outcomes are influenced by norms and referred to as commitment, removal of external barriers, and incentives, respectively (McKenzie–Mohr & Smith, 1999). In a review of literature examining studies using social marketing theory as the chosen theoretical guide, social marketing theory was an effective framework for understanding organizational behavior change interventions (Stead, Gordon, Angus, & McDermott, 2007). Others suggest that Community–based Social Marketing theory may be used within school systems to enhance literacy and academic achievement (Monroe, 2003). The theory’s integrated nature and relevance to school–wide change made it applicable to understanding the influence of school culture on EE integration.

The six components of Community–based Social Marketing theory are applicable for reducing the aforementioned barriers to EE implementation in schools. They also provide a structure to consider with regards to influencing the cultural barriers of EE implementation through pre–service and in–service teacher trainings. According to Community–based Social Marketing theory, individuals are more likely to engage in behaviors that other people, particularly those they respect, are already engaged in. This concept of norms has been highlighted by others with regards to the use of mentor teachers and team–teaching practices when successful school–based EE integration was the goal (Benetti & Marcelo de Carvalho, 2002; Hanna, 1992; Van Petegem et al., 2005). Burke (2002) suggested that culture is closely related to organizational norms. However, when EE integration is the norm in a school, resistance may still exist. Using Community–based Social Marketing as a framework, what are the characteristics of a school’s culture which promote and hinder EE integration?

Purpose/Objectives

Although much research exists regarding barriers to teaching EE within schools and on the link between school–wide change and school culture, there has been little examination of how culture may influence EE integration specifically. Trinity School is an urban, private school in Atlanta, Georgia serving children age three through sixth grade and has been recognized as an organization dedicated to EE. The purpose of this study was to understand how
Trinity’s culture has influenced EE integration. The objectives of this qualitative case study were to describe:

1. Characteristics of Trinity which influence or hinder EE integration.
2. Resources provided by Trinity which influence EE integration.
3. Incentives for integrating and teaching EE at Trinity.
4. Barriers to integrating EE at Trinity.
5. Administrations’ perspective on EE integration at Trinity.

Methods

In order to understand how the teachers and administration at Trinity have successfully integrated EE into their curriculum, a qualitative study was conducted. Culture is defined as the “way we do things around here and concerns deeply held beliefs, attitudes, and values” (Burke, 2002, p. 13). Qualitative research methods were used for this study because they allowed the researcher to build trust with the teachers and administration at Trinity, ask probing questions, and form relationships leading to a deeper understanding of individual beliefs, attitudes, and values regarding EE and its relevance across the elementary curriculum (Hatch, 2002). In addition, given the exploratory nature of this study, the researchers intended to examine the themes which emerged from the qualitative data to develop a quantitative instrument for broader use with a larger sample.

Phenomenology was used in designing and conducting this study, adhering to the procedures for conducting phenomenological investigations outlined by Moustakas (1994). Phenomenology is concerned with the essence of a phenomenon through the lived experience of participants (Crotty, 2003). The phenomenon of interest in this study was how teachers at Trinity perceived the school’s culture to influence EE integration.

Trinity School was selected as the research site for this study because of the school’s dedication to integrating EE into the curriculum and its potential to serve as a model to other schools. At Trinity, EE is the norm. The school has a number of programs and activities dedicated to EE. In addition to its focus on teaching EE, the school believes in actively participating in environmental stewardship and undertakes projects that develop appropriate sustainable practices as an institution.

Participants were purposefully selected by Trinity’s administration based on their current level of EE integration. After being explained the purpose of this study, administration was asked to identify teachers who they believed (a) would be valuable to talk with concerning their experiences (both positive and negative) with EE integration at Trinity and (b) had been teaching at Trinity long enough to have knowledge of the school’s culture. Six teachers were chosen; three who have consistently integrated EE (supports EE integration) into their classrooms and three who were identified as being resistant to EE (opposes EE integration). In addition to the teachers, one administrator, identified by a senior administrator, was interviewed who has been a key player in the adoption of EE throughout the school. School leaders can play a key role in changing school culture (Deal & Peterson, 1998) and the researchers wanted to better understand this potential influence at Trinity.

The purpose of interviewing these two types of teachers was to determine if teachers who facilitated less EE programs did so because they had not found ways to overcome the barriers to teaching EE or for other reasons. The researchers wanted to know if personal views about the environment might have influenced what the teachers chose to teach in their classrooms. The researchers also wanted to know how the school culture potentially influenced the frequency with which the teachers were implementing EE activities in their classrooms. Qualitative research methods were deemed most appropriate to accomplish this.

After the participants were identified by administration, they were contacted through email to explain the purpose of the study and to ask for their voluntary participation. They were not informed specifically why administration identified them to participate (i.e., so as to prevent feelings of being targeted for not conforming to school norms), but rather that
administration believed their experiences would be valuable to share in this study.

Description of the Participants

Seven people were interviewed for this study, including six teachers and one administrator. Participants are described below in the order that they were interviewed and pseudonyms are used to protect participant identities. Each participant is identified as either supporting EE integration or opposed to EE integration in their classroom curriculum.

Mary (supports EE integration) has been a fifth grade teacher at Trinity for 15 years and has seen many changes in the curriculum and administration. As a fifth grade teacher, Mary teaches social studies and language arts, but her students go outside of the classroom every day. In fifth grade, the students go on two overnight EE field trips. Mary loves these trips and they are a highlight of the year for her.

Cheryl (supports EE integration) has been at Trinity for four years. She is a lead science teacher and is responsible for teaching all fifth grade science, as well as the third grade science laboratory. Cheryl is also head of the River Kids program, in which all fifth graders at the school participate. Before coming to Trinity, Cheryl worked at a public school and was a non–formal educator at a large zoo. In addition to her teaching duties, Cheryl is on the Enviroscape Task Force Committee and teaches Faculty Forums (continuing education) on the Enviroscape.

Lacy (opposes EE integration) is a first grade teacher and has been at the school for eight years. Before coming to Trinity, Lacy worked as a public school teacher for nine years. In addition to the science lessons conducted in her classroom, her students attend a science laboratory every six days. Lacy and her class spend a lot of time outside exploring and playing, but there are very few environmental lessons that are intentionally taught outside.

Hannah (opposes EE integration) is the lead science teacher for the early learning department (3 years old through first grade) at Trinity and has been there for four years. She does not have a teaching background and this is her first teaching job. Hannah’s background is in biology and psychology and she worked in the medical field prior to coming to Trinity. She has experience leading backpacking trips and loves the outdoors. She is happy to help teachers who are having a difficult time identifying ways to take their students outside, but was identified as someone resistant to integrating EE.

Ashley (opposes EE integration) is a fourth grade teacher at Trinity and has been teaching there for four years. She started teaching fourth grade in Virginia at a public school and then moved to Washington D.C. to work at an independent international school. She is responsible for teaching all subject areas, including science. Ashley takes her students out for various activities in all subjects, but feels that the students get easily distracted outside. She has an assistant teacher for half of the day and feels more comfortable doing outside activities with the assistant present.

Dr. Amy is the Associate Head at Trinity and has been there for three years. She has a background in elementary and special education and is certified to teach pre–Kindergarten through 12th grade in a variety of subjects. She has a Ph.D. in Education, Leadership, and Policy Studies and has worked in both public and private school settings across the country. Her experiences range from inner–city to rural communities. In addition to her daily administrative duties, she serves on the faculty/staff Enviroscape Leadership team. She describes herself as an avid environmentalist and says she loves all things outdoors.

Missy (supports EE integration) has been at Trinity for 17 years. Among her other responsibilities during her tenure, she worked as EE Coordinator for two years and is currently a first grade teacher. Missy helped form partnerships between the school and various members of the community who work in the environmental field. She also started some of the EE activities at the school like composting and gardening. Her classroom is filled with natural objects (such as baskets of acorns and pinecones) and she has a class guinea pig which the students study during the year.

Data Collection and Analysis

Each of the teachers and the administrator participated in semi–structured interviews lasting between 20 and 45 minutes. The
questions for the interview guide were written following a comprehensive review of the literature regarding barriers to teaching EE in the classroom. Participant responses were transcribed verbatim and then analyzed using domain analysis (Spradley, 1980). Each interview was analyzed separately and domains which emerged were extracted from the transcription. Overarching domains were then merged and common domains were identified across all participants.

A number of strategies were employed to insure credibility (validity) and dependability (reliability) of the study. One way the researcher ensured credibility was through peer review. The researcher’s peers, fellow graduate students, looked at the data and analysis results and determined if the researcher’s interpretation was accurate. The reviewers helped decide if there was a problem in the interpretation or if additional data needed to be collected. Member–checks were also conducted with the participants. After the interviews were transcribed, the transcripts were sent back to the participants for review. The participants had the opportunity to clear up any miscommunications at that time. Lastly, reflexivity (self–reflection to recognize one’s own biases) was employed to strengthen credibility (Ary, Jacobs, & Razavieh, 2002). Researcher subjectivity statements and bracketing were used to document the potential for bias in the data collection process. Bracketing was used to account for the researcher’s previous experiences with EE (Ashworth, 1999).

Once a trusting relationship was established with participants through the interview and member–check process, field observations were conducted. Each of the teachers allowed the researcher to visit their classroom and observe aspects of their teaching, including room set–up and student engagement in experiential learning–based activities related to the environment. In addition, journaling was used to document the researcher’s feelings immediately following the participant interviews and classroom observations. These notes were used to aid in domain interpretation and document the potential for researcher bias.

The researcher strengthened the dependability of the study by using an audit trail. Notes on the participants, site selection, and methods of data collection, tape recordings, and field notes were reviewed by the researcher’s graduate committee. This helped to determine if the study could be replicated. In addition, the researcher used the code–recode strategy. All of the data was analyzed and coded and then left for a period of time. It was then revisited and recoded for comparison (Ary et al., 2002).

Results

Domains are presented below by research objective and in order of the frequency of their occurrence in the raw data. Although all domains are presented, due to space limitations, only selected domains are supported by evidence from the interviews.

Characteristics Influencing the Integration of EE

Eight domains emerged from the data regarding characteristics of the school which have influenced or hindered EE integration, including: support, administration, teachers, parents, freedom in curriculum and exploration, collaboration among teachers, a research–based mentality, and an integrated curriculum.

Support from colleagues was one characteristic of Trinity School mentioned most often. The school has a number of cheerleaders who help to spread the word about the importance of EE and to help teachers establish lesson plans they can use with their classes. These cheerleaders do everything from speaking individually with teachers about specific lessons, to going outside with classes, to sending out a monthly newsletter called the Enviroscoop that gives teachers ideas about lessons that can be implemented during the season or month.

The ideas from school cheerleaders have helped teachers recognize easy ways to integrate EE in the classroom. This kind of support comes from peers who understand the challenges of a busy school day and who can make realistic suggestions. Meeting with other teachers in a type of “support group” environment gives teachers who are unsure about teaching EE strategies lesson plans they can use with the topics they are currently teaching their students. It also provides teachers
with an outlet to vent, without the presence of administrators, difficulties they may have experienced when teaching EE—subject matter.

Five of the teachers interviewed mentioned the freedom within the curriculum that allows for exploration and creativity. This freedom allows teachers to take their students outside and to try new things. It also gives them flexibility in their school day to pursue the interests of their students. Although they are required to meet certain standards, they are encouraged to help nurture those interests. Lacy summed up the feeling of freedom at the school well:

I think as a school we really try to teach based on the interest of the kids. It is like we teach our curriculum but we really try to tie things into their interests. Down here now it is very much a let them be kids, let them explore, that’s how kids learn. So yeah, I think there is definitely more of a push for that because that is part of what kids enjoy doing. However, one of the great things about this school is that they really give us the liberty to teach the way we think our kids need.

Resources Provided That Influence EE Integration

Three domains emerged from the interviews regarding resources which Trinity provides to teachers for conducting EE activities, including: the Enviroscape, equipment, and professional development opportunities.

Every teacher interviewed mentioned the Enviroscape (the physical spaces and property) at the school as a resource that has helped influence EE integration. There are garden plots available for each grade level, as well as many outdoor areas designed for teaching and learning, such as an amphitheater and council rings with stumps for students to sit on. Hannah described the Enviroscape as:

…any learning area that’s not necessarily within four walls. So that could be Discovery Woods, Discovery Playground, looking at our different aquariums, kind of as a teaching tool. Using the amphitheater, the outdoor space there, using our gardening plots…it’s the philosophy of incorporating the environment into our curriculum.

Spaces that provide shade and seats were helpful to the teachers who were more hesitant to take students outside. The intentional uses of the space at Trinity seemed to leave little room for excuses not to take students outdoors.

Incentives for Integrating EE

A single dominant domain was identified as an incentive for teaching EE: the importance of teaching about the environment.

Although teachers are not being rewarded monetarily for teaching EE, there are personal incentives to getting students out of the traditional classroom. Four of the six teachers interviewed discussed how integrating EE is beneficial for both the students and teachers. Each of the teachers had different reasons for believing that EE is important. Cheryl felt that integrating EE is important for both students and teachers:

I think that an appreciation for our resources is so important not only for our students, to raise them to be aware that we need to take care of what we’ve got, but also for the teachers who were not raised in this environmentally aware time. And then I think it’s for your state of mind. For my personal state of mind, for my students state of mind, for my colleagues state of mind, I think if you get outside it changes you, I know what it does for me, even if it’s hot and sweaty and yucky, it just kind of centers me.

Even the teachers who were identified as being resistant to teaching EE felt that it is important for students to be environmentally aware. Mary discussed how some students have taken on the environment as their cause:

I just think it’s become such an important aspect of everyday life. I think with all the articles and all of the news reports and things about our environment its come to the forefront so much that I think kids are quite aware of it and they know it’s important. Some of them have really almost taken it on
as a cause. They’re quite passionate about it…it’s important to keep that as a reminder, and talk to the kids…

This awareness is important to students who consider the environment their cause and to the teachers who teach them. As with any appropriately implemented EE intervention, this moves learners from awareness to pro-environmental action (Hudson, 2001; Jacobson, 1999).

**Barriers to Integrating EE**

Six domains emerged from the interviews regarding barriers to teaching EE, including: comfort, lack of time, lack of interest among teachers, politics, dangers and safety concerns, and students being distracted.

The barrier mentioned most often to integrating EE was comfort with the subject and with taking students outside. In her interview, Lacy, a teacher who was identified as being resistant to teaching EE, said that for her, not knowing what to teach was the biggest barrier:

> I would say not knowing myself what it is I would teach and what is important. How would I teach it? What’s appropriate for a first grader?

For some teachers, simply being outside is out of their comfort zone. Missy discussed some of the things teachers are uncomfortable with:

> They don’t like to be outside and they’re not comfortable digging in the dirt and they’re concerned about wasps and bees and so on.

Taking students outside can be a huge challenge for teachers who do not enjoy spending time outside. They may be nervous, uncomfortable, and worried about what could happen to their students while outside. Cheryl discussed some of the barriers she has seen to integrating EE among the teachers at Trinity:

> I think that it’s not in a teacher’s comfort zone. I think that is the biggest obstacle here. That it’s just too much trouble, it’s something new, they will be hot and smelly when they come in. Um, they, there are too many bugs. How am I supposed to teach math when I am out there? And so that argument has kind of gone away but it’s more like, well, they’re too distracted out there. If a kid gets scratched it will take their focus away, if there are too many other people out there they will be distracted. It’s just, I think it comes down to a teacher’s comfort zone and it seems like more trouble than it’s worth.

A lack of interest among teachers was also identified as a barrier to teaching EE. Lacy discussed her lack of interest in EE:

> Honestly I think, and I don’t know if this is accurate or not, but I really think there are some people who are very interested in that and there are those who aren’t. And it is not that I don’t care about the environment, because I really do, it is just not a passion of mine. It is not something I want to read about and that I want to do, you know I am not interested in having a garden. So we take the kids in the woods because we know that’s where we know they like to be and we go on hikes but it’s something I do because I know the kids like it, not because I like it.

Although Lacy recognizes the importance of taking the students outside, she finds it difficult to do a lot of teaching about the environment. In her class, they spend time playing outdoors and walking on the trails but very little instruction goes on out of the classroom.

Cheryl also discussed a lack of teacher interest in EE as a barrier:

> It goes back to what they’re interested in…it’s kind of my thing not their thing but they were asked to attend. I did one of those Faculty Forums on River Kids and they were asked to attend and they didn’t come…they were strongly encouraged to come and they didn’t. They should have, they should show more interest in it.

It was very obvious during Cheryl’s interview how disappointed she was in the lack of teacher interest in her program idea. Although she is responsible for teaching fifth
grade science, she felt the other, non-science teachers should have an understanding of what their students were doing during science time. The lack of teacher enthusiasm and participation in her program was obviously frustrating for her. If teaching EE was more of a school-wide norm, perhaps fifth grade non-science teachers may be more interested in attending such programs.

Politics was another barrier mentioned by teachers in this study. Missy felt that politics was the biggest barrier to teaching EE:

I think the biggest thing, and I get this as far as administration and from other people, is the political, the political part of that. Some people thinking that there’s not global warming…I find that surprising. It seems pretty obvious to me that everybody would be for recycling…but a lot of people really think that it is more radical, and of course if you go to other countries or other parts of the country it’s just, it’s like brushing your teeth.

Politics is a barrier that has hindered EE integration in other studies. Teachers are often nervous to teach potentially controversial subjects, such as global warming, ozone depletion, and population growth that could be considered taboo and may fear resistance from parents or administration if such topics are discussed in class (Kim & Fortner, 2006). Some authors argue that political barriers to EE integration are more deeply rooted in the school’s culture (Heimlich et al., 2004; Powers, 2004; Van Petegem et al., 2005).

Conclusions/Recommendations/Implications

Characteristics Influencing the Integration of EE

The teachers at Trinity identified a number of characteristics that have influenced EE integration. The domains relevant to the characteristics of the school that allowed for EE integration were support from teachers, parents, and administration, freedom in the curriculum for exploration, collaboration among the teachers, a research-based mentality, and an integrated curriculum. Past research identifies a lack of administrative support as a barrier to teaching EE. Dyment’s (2005) study found that, “schools appear to be placing increased emphasis on literacy and numeracy, with a view to ‘teaching to tests’… leaving little room for outdoor teaching” (p. 38). At Trinity, there was emphasis placed on outdoor teaching and learning. Support from the administration, as well as other teachers and parents, was a characteristic that influenced integration. Hannah (1992) suggested that any curriculum barrier can be overcome with student, teacher, and parent support. According to Community-based Social Marketing theory, norms are important when creating behavior change within an organization. The teacher-to-teacher and administrative support systems within Trinity can be seen as contributing to a norm. If supporting EE comes from all sides, teaching EE becomes part of the culture and an expectation.
Having a place to discuss activities and lessons influences the integration of EE. A study by Benetti and Marcelo de Carvalho (2002) found that some teachers felt there was a lack of places for teachers to communicate ideas with one another. At Trinity, collaboration among the teachers is common. It is standard practice for teachers to meet and discuss lesson plans and units. These meetings are a form of communication, another aspect of Community-based Social Marketing, which have become a norm within the school. These meetings give teachers an opportunity to share as well as a space to vent frustrations and concerns. This type of interpersonal interaction among teachers can play a key role in persuasive efforts in favor of positive behavior change (Haldeman & Turner, 2009) and likely contributed to the pro-EE culture at Trinity School.

Freedom within the curriculum was another characteristic identified by teachers as a variable that helped support EE integration. Having flexibility and choice may be motivation for some teachers to teach EE activities. Flexibility has been found to be a key component influencing adult adoption of new behaviors (Merriam, Caffarella, & Baumgartner, 2007).

**Resources Provided That Influence EE Integration**

A review of the literature identified a lack of resources as a barrier to integrating EE. This lack of resources was identified as a lack of relevant materials (Benetti & Marcelo de Carvalho, 2002; Dyment, 2005; Hannah, 1992; Kim & Fortner, 2006; McKeown–Ice, 2000; Powers, 2004; Rickinson et al., 2004; Van Petegem et al., 2005;) as well as a lack of available and usable outdoor spaces (Dyment, 2005; Ernst, 2007; Hannah, 1992; Kim & Fortner, 2006; Simmons, 1998). The domains relevant to the resources available at the school were the Enviroscape, monetary resources, and equipment available to the teachers. The types of activities and lessons conducted by the teachers at Trinity were a reflection of the spaces and resources available to them. The teachers acknowledged these resources and gave examples of how the equipment and spaces available to them have influenced their integration of EE. Within a community-based social marketing context, resource availability has been a significant influencing factor on community-wide behavior change (Haldeman & Turner, 2009). Viewing Trinity School as a community, it is not surprising that equipment and space resources influenced EE integration at the school-wide level.

The Enviroscape was the most frequently cited resource by the teachers. This space was purposefully constructed to create usable outdoor spaces for hiking, exploring, and teaching. For many teachers, taking students outside means going off campus, so issues of transportation, funding, and safety arise (Simmons, 1998). This is a way Trinity has addressed an external barrier that may prevent teachers from integrating EE. According to Community-based Social Marketing theory, removing external barriers enhances the likelihood of permanent behavior change (McKenzie–Mohr & Smith, 1999).

**Incentives for Integrating EE**

The incentives for teaching EE at Trinity were personal to each of the teachers. Shuman and Ham (1997) found that “the stronger the teachers’ commitment to teach EE, the greater the probability that they will overcome existing barriers and actually carry out the behavior” (p. 30). Teachers who were identified as strong proponents of EE in this study mentioned the benefits to teaching EE for themselves as well as their students. They were more likely to take their classes outside because they felt comfortable and believed it was beneficial. Teacher comfort and confidence with science was a barrier identified in previous research.

Although teachers were not rewarded financially for their teaching, they were recognized and appreciated by administration for their attempts to take students out of the traditional classroom. As self-efficacy theory would suggest, successful performance of a behavior which results in a positive outcome, such as public recognition by administration, helps the behavior become habitual (Haldeman & Turner, 2009). This recognition can be considered an incentive for teachers. When teachers are recognized by administration in front of other teachers, they may be more likely to continue their behavior. This may also act as
a prompt and an incentive for other teachers to find additional ways to integrate EE activities.

**Barriers to Integrating EE**

The domains significant to the barriers associated with integrating EE included lack of comfort with the subject, lack of time, lack of interest, politics, dangers and safety concerns, and the worry that students will be distracted outside. All of the barriers identified by the teachers at Trinity were also identified in the review of the literature.

The most often cited barrier to integrating EE was a lack of comfort being outside and with teaching about the environment. “If a teacher has a positive attitude toward teaching environmental issues (attitude), has enough knowledge on environmental issues (content knowledge), and knows how to teach the environmental issues (pedagogical knowledge), then he or she will teach the issues more often or more properly” (Kim & Fortner, 2006, p. 16). However, previous exposure to EE–related curricula, including experiences where curricula were implemented outdoors, can influence in–service teacher EE integration. Some authors suggest the lack of comfort and confidence with teaching science and engaging in outdoor learning experiences with students relates to the experiences of teachers during their own pre–service teacher education program (Heimlich et al., 2004; Mastrilli, 2005; McKeeown–Ice, 2000; Moseley, Reinke, & Bookout, 2002; Powers, 2004). Pre–service teacher education programs should consider integrating EE–based curricula such as Project Learning Tree, Project WILD, and Project WET in relevant teaching methods courses. Teacher education students should also be encouraged to incorporate an outdoor–based lesson during their student teaching experience. Constructive feedback following the experience from a supervising teacher could increase the likelihood of additional, more successful outdoor learning experiences for the student teacher, and once placed as a full–time teacher. As suggested by the aforementioned studies, exposing a pre–service teacher to EE increases the likelihood of EE integration in their classroom as an in–service teacher.

**Administration’s Perspective on Integrating EE**

The domains related to the administrator’s view on EE integration included the decision to make EE important, providing help to teachers on how to teach EE through trainings, permission to go outside and be creative, collaboration, property and resources, integration with the curriculum, and incentives. In addition to making it important, the administration at the school supports the integration of EE. Administrative support was previously identified as a barrier to teaching EE (Van Petegem, et al., 2005). Trinity’s administration follows a bottom–up approach to collaborative leadership where teachers are selected to be “change champions” (Burke, 2002) who work with administration to promote EE integration and constantly remind staff of EE’s importance. These reminders may be viewed as prompts, a key variable influencing the likelihood of behavior change (McKenzie–Mohr & Smith, 1999). Trinity’s efforts to integrate EE throughout the school day allows EE to become a component of existing courses, helping it become an engrained part of the school’s culture (Heimlich et al., 2004).

**Recommendations**

Although the results of this study cannot be generalized to other schools, the findings can be transferred and used to inform other programs interested in EE integration. The researchers propose the following recommendations to increase the likelihood of EE integration: (a) make a conscious decision to make EE important by supporting the program with resources and time; (b) appoint teachers to certain jobs within the EE program. These point people act as change champions (Burke, 2002) and mentors to others in the school, creating a norm; (c) designate spaces at the school that can be used for EE. This could be a nearby park, the playground, or even a parking lot. Setting aside the space shows teachers it is important and there for them to use; (d) provide teacher trainings on how to write grants for supplies and how to use designated EE spaces. These trainings should include ideas on lessons and activities that correlate with school standards and can be conducted in designated spaces; (e)
create a resource room with equipment and materials for everyone in the school to use. The available equipment should be known to teachers and available for check out; (f) teachers who feel comfortable teaching EE should be partnered with teachers who feel more resistant or uncomfortable teaching outside. The more experienced teacher can act as a mentor to the less experienced teacher and (g) the administration should make an effort to acknowledge teachers in the school who are integrating EE activities. This could be done using a bulletin board that features an Environmental Educator of the Month and highlights specific activities they have used in their classroom.

These results also have implications for agricultural education. Trinity’s efforts to integrate EE throughout the school day allowed EE to become a component of existing courses, helping it to become part of the school’s culture. A method of integrating subject matter across disciplines was developed by researchers from the National Research Center for Career and Technical Education and involved mathematics instruction (Stone, Alfeld, Pearson, Lewis, & Jensen, 2006). This model was designed to help career and technical education teachers from various disciplines integrate a deeper level of mathematical instruction within their respective disciplines by “uncovering” the embedded mathematics that were already in the curriculum. Teacher–teacher collaboration helped establish a school–wide norm in this study and allowed teachers to share resources and expertise. Numerous EE concepts are embedded in the agricultural education curriculum and additional research is needed to better understand how to more visibly link the two.

Agricultural education and EE have many philosophical and methodological similarities. Although this study examined the influence of culture on EE integration at the elementary level, more information is needed to understand the influence of culture on agricultural education and EE integration at the university and secondary school levels. Future studies should investigate the cultural barriers within agricultural education as a discipline to integrating EE and other progressive, science–based subjects. An understanding of culture may provide wisdom which results in EE being viewed as a complimentary, interrelated discipline to agricultural education and worthy of inclusion in pre–service teacher education programs. As a visible and integrated component of agricultural education at the university level, EE may be more likely to become part of the elementary and secondary school’s culture. The potential for cohesion between the two disciplines is strong and warrants further investigation.

References


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Effects of Inquiry–based Agriscience Instruction on Student Scientific Reasoning

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The purpose of this study was to determine the effect of inquiry–based agriscience instruction on student scientific reasoning. Scientific reasoning is defined as the use of the scientific method, inductive, and deductive reasoning to develop and test hypothesis. Developing scientific reasoning skills can provide learners with a connection to the scientific process by creating knowledge through evidence–based or authentic investigations. Higher reasoning scores indicate the learners’ ability to change a nonscientific belief based on factual evidence. This quasi–experimental study investigated the effect of two teaching methods (inquiry–based instruction and the subject matter approach) on agriscience student scientific reasoning. Fifteen agriscience education classes confined within seven secondary schools across the United States participated in the study. Utilizing univariate analysis of covariance, there was a statistically significant difference between groups based on scientific reasoning. Those students taught through inquiry–based instruction were reported as having higher scientific reasoning than students taught through the subject matter approach.

Keywords: inquiry–based, agriscience, scientific reasoning

Introduction/Literature Review

President Obama’s administration stated a revamped focus of No Child Left Behind (NCLB) that would replace current “inadequate assessments” and adjust “support [for] schools to gain improvement [on assessments], rather than punish those for not improving” scores in science, math, and reading (Obama, 2007). Arne Duncan, United States Secretary of Education stated, “I ask you to join President Obama and me in a new commitment to results that recognizes and rewards success in the classroom...” (Duncan, 2009, p.1). National trends in student science achievement have differed from the gains in math and reading. The stagnant and lowering scores in science achievement have caused concern through the nation (USDE, 2009). Continued efforts to provide research–based evidence have produced research in the areas of teaching and learning with experimental designs based on standardized testing (Anderson, 2002). In response, the National Research Council (NRC) has pushed for greater hands–on focus in science and inquiry–based instruction (NRC, 1996; 2000). However, a continuous focus on assessments and teaching to cover material as prompted by NCLB, “teaching for the test” can derail science education and shift focus away from “teaching higher–order thinking, amount of time spent on complex assignments, and in the actual amount of high cognitive content in the curriculum” (Valli, 2008, paragraph 6). Lederman (1998) argued less is more, and focusing on in–depth understanding unifies scientific concepts and leads to greater success on achievement exams.

The NRC explained that students benefit by learning science through authentic investigations similar to those conducted by professional scientists. In theory, with the placement of science in a context through inquiry–based instruction, teachers and students begin to develop their approach to science, and this investigative learning leads to greater
understanding (NRC, 2000). The NRC reports and Project 2061 led to the reinvention of the inquiry philosophy and increased interest in the United States educational system in search of producing learners with the ability to apply scientific process skills and to think critically. Inquiry–based instruction continues to focus on the ability to explain the process examined in the development of learner answers (Keil, Haney, Zoffel, 2009). Furthermore, new teaching methods or reinvented ways of instruction must meet the double standard of creating higher student standardized test scores and develop student achievement of high–order thinking. The USDE (2009) stated, “America’s teachers must use only research–based teaching methods and the schools must reject unproven fads” (para. 13). Myers (2004) stated agriscience students should exhibit a working knowledge and foundation of science concepts and processes to be successful in the industry and to perform well on achievement tests.

Standardized tests and traditional lecture–based teaching are creating learners that lack the ability to develop arguments with adequate evidence (Baron 1991; Cerbin, 1988; Perkins, Farady, & Bushey, 1991). Learners are now less likely to link evidence with claims (Kuhn, 1992; 1993; Shaw, 1996). Nonetheless, all 50 states have adopted a variety of testing and accountability programs (Council of Chief State School Officers, 2002) based on standardized tests. An examination of these characteristics together led to the NRC (1998) conclusion that learners are not being effectively prepared for postsecondary education or workplace careers.

The acquisition of scientific reasoning does not call for a lack of focus on content knowledge. Means and Voss (1996) stated that reasoning skills and content knowledge are related. As a larger part of this study Thoron and Myers (2011) found students, taught through inquiry–based instruction, scored significantly higher on content knowledge assessments when compared to the subject matter approach. Current teaching methods are not satisfying the needs of individuals entering careers in agriculture, attending major universities, or pursuing other postsecondary education endeavors (NRC, 1998). The NRC (2000) stated that inquiry–based instruction is the optimal tool to provide students with the ability to transfer knowledge to real–world applications. Educators must focus on creating learners who can think their way through a real–life problem, engage in the curriculum, and ask questions of their peers to expand thinking beyond the context of what they were taught to remember in high school. Continued progress to provide evidence that agriculture contains science in secondary classrooms across the nation must be supported by emerging research that calls attention to this matter. Odden (1991) stated all electives should provide evidence of contributing to the core academics. As agriscience education integrates more science concepts, the teaching methods utilized in science education need to be investigated. This led to the examination of a teaching methodology that will promote higher standardized test scores and scientific reasoning in an agriscience context.

Scientific reasoning (SR) is the connection of the process of producing scientific knowledge through evidence–based reasoning. Scientific reasoning is generally recognized as inductive or deductive. Deductive reasoning has roots back to Aristotle with the creation of prediction and outcome basis. Inductive reasoning was developed by Sir Frances Bacon. Inductive reasoning utilizes evidence to create theories. The best form of SR has been studied in science education research (Schen, 2007), and few studies utilize both inductive and deductive reasoning in the same study (Kuhn & Pearsall, 2000). This study utilizes both deductive and inductive reasoning through the use of Lawson’s Classroom Test of Scientific Reasoning (LCTSR). Lawson (1982) identified five factors involved in advancing Piaget’s formal reasoning during his scientific reasoning test. Lawson stated that students must generate expectations, control variables, generate causes, determine probabilistic reasoning, and determine proportional reasoning when the goal is advancing scientific reasoning.

Lawson’s first scientific reasoning test was completed through a short answer essay type exam, but because of the emphasis on high–stakes testing, he created a multiple–choice test (Lawson, 1992). Schen (2007) utilized this exam with inquiry–based instruction in university introductory biology courses and noted that
reasoning ability was determined and not prior knowledge. Schen’s study indicated a positive correlation between achievement scores and reasoning.

Lawson and Weser (1990) investigated the stability of nonscientific beliefs of evolution throughout the semester and its relationship to student levels of reasoning ability. Lawson and Weser hypothesized students with a higher reasoning ability would change their nonscientific beliefs based on the scientific evidence presented. The researchers found that students’ nonscientific beliefs had a positive correlation with the evidence presented. The researchers also found that students who had a higher scientific reasoning score changed their nonscientific beliefs the most, which led Lawson and Weser to conclude that skilled learners were better able to adapt their nonscientific beliefs to scientific beliefs.

Lawson, Alkhoury, Benford, Clark, and Falconer (2000) studied college students using the LCTSR by changing the difficulty of the hypothesis presented during quizzes. Lawson et al. found higher level reasoners were better able to transfer problems on an exam. Lawson et al. (2000) conducted a similar study and found the same results. The authors concluded that the greater proficiency in the LCTSR, the greater proficiency in answering questions on achievement exams.

In a study of mathematics instruction, Davis (1990), videotaped two fifth–grade boys solving a problem with pizza slices. After they discussed the problem, sketched the solution, and used pattern blocks they were able to determine the correct answer. Earlier, one boy tried to simply use a paper and pencil method and arrived at an incorrect answer. At the completion of the boy’s problem–solving of the pizza slices their teacher was not satisfied with the way they solved the problem. She then directed the students to solve the pizza problem through an easier solution. One year later Davis gave the same boys the same problem and again videotaped the boys creating their solution independently. Each boy indicated he remembered solving the problem and recalled the teacher directing him to an easier method to find the correct answer. However, they could not remember how the teacher solved the problem. Each boy then solved the pizza problem with his own method based on prior experience. Davis stated that the teacher’s solution had no bearing over time. Davis’ study illustrated that constructivist theory and inquiry–based instruction seek a deeper understanding and incorporate learning and knowing to develop students who can revisit a similar problem years later and have the ability to use previous experience to obtain successful results (NRC, 2000). In summary, the LCTSR has shown a connection to higher achievement scores. However, there are few studies that examine the development of scientific reasoning through comparing teaching methods.

Theoretical/Conceptual Framework

Constructivism was the guiding philosophical perspective used in this study. The constructivist approach to teaching and learning has been highlighted in research and in practice in numerous educational contexts (Bransford, Brown, & Cocking, 2000; Hamlin, 1992; Lampert, 1992; Myers & Dyer, 2006; Newcomb, McCracken, & Warmbrot, 1993; NRC, 2000; Phipps, Osborne, Dyer, & Ball, 2008; Schunk, 2004). Schunk stated, “…the rise of constructivism has been theory and research in human development, especially the theories of Piaget and Vygotsky” (p. 285). Piaget’s (1972) Theory of Cognitive Development and Vygotsky’s (1978) Sociocultural Theory (1978) combined to form the theoretical basis for the study from a constructivist philosophical perspective.

Piaget’s (1972) Theory of Cognitive Development depends on biological maturation, experience with the physical environment, experience with the social environment, and equilibration. Biological maturation is the factor of a learner maturing with age, experience with the physical environment refers to the learners’ interaction and experience within a given learning situation, experience with the social environment refers to the learners’ interaction between peer learners and instructors, and equilibration refers to an adaptation between cognitive structures and the environment (Duncan, 1995). Piaget proposed that learners organize their knowledge into schemes and process learning through adapting these schemes
to interpret new experiences. When learners encounter new experiences they attempt to understand by assimilating the new experience into a previous knowledge schema to reach a point of cognitive equilibrium (Phillips, et al., 2008).

Piaget’s (1972) theory is accepted to describe the constructivist theory through the belief that people learn by interacting with their environment, peer learners, and instructors, and by transforming those experiences into their schema through assimilation (Phipps, et al., 2008). Constructivism is rooted in the learners’ view that interacts with their previous experiences, environment, and people (Fosnot, 1996).

Vygotsky’s (1978) Sociocultural Theory is a foundational theory of constructivism that focuses on the social environment as a facilitating portion of learning. Vygotsky argued that humans have the ability to alter their environment for their own purposes (Schunk, 2004) through language and social interaction (Tudge & Scrimsher, 2003). Vygotsky’s theory stresses the interaction of interpersonal skills that create meaningful learning and stimulate development of cognitive growth through a context (Schunk, 2004). Meece (2002) suggested that Vygotsky’s theory places social interactions in a pivotal role in knowledge construction.

Social interactions may come in the form as student–to–student interactions, teacher–to–student interactions, and student to teacher interactions. In this study, assistance in cognitive development is provided by the agriscience teacher.

Vygotsky’s (1978) Sociocultural Theory provides a framework for the constructivist portion of this study. The theory provides a foundation for social learning between individuals in the classroom environment, learning in a context, and the teacher in assuming a facilitating role for the learners. Piaget’s theory has similar implications and helps the richness of constructivism through the acknowledgement of learners’ experiences and the learners’ ability to adopt and adapt new knowledge into their schema.

The model for this study (Figure 1) depicts the interactions that occur in an inquiry–based classroom. Because this study is part of a larger study, there was more than one outcome investigated. Static attributes were variables that would be collected during the investigation, and the teaching and learning process describe the inquiry–based process.
Purpose/Objectives/Hypotheses

The purpose of this study was to determine the effects of teaching method on scientific reasoning of high school agriscience students. The specific objectives guiding the study were to:

1. Describe the population of the study.
2. Ascertain the effects of inquiry–based instruction on scientific reasoning of high school agriscience students.
3. Examine the relationship between scientific reasoning, ethnicity, sex, year in school, and socio–economic status of high school agriscience students.

The null hypothesis, $H_0$: no significant difference in student scientific reasoning based upon the teaching method (inquiry–based teaching or subject matter approach), guided the analysis of the second objective.

Methods

The population of this quasi–experimental design was composed of students at ten high schools offering agriscience education in the United States ($N = 437$). The accessible population was students of the National Agriscience Teacher Ambassador Academy (NATAA) participants. A purposive sample was selected according to the ability of the teacher to utilize the integrated agriscience curriculum and inquiry–based instruction and subject matter approach to teaching.

The content and context of the lessons for both the subject-matter and inquiry-based lessons were deemed appropriate by a panel of experts. Seven units of instruction that addressed the soil and plant science portion of the National
Agriscience Content Standards for an agriscience course in the United States (CAERT, 2008) were selected by the researcher from the Animal, Plant, and Soil Science curriculum developed by Center for Agricultural and Environmental Research and Training, Inc. (CAERT). The instructional plans were evaluated for content validity by a panel of experts from the Agricultural Education and Communication Department and the School of Teaching and Learning at the University of Florida. The panel determined that the inquiry-based and subject matter lessons were suitable for the grade levels and deemed the lessons appropriate.

The independent variable in this study was the teaching method used in the agriscience classes. Intact treatment groups were randomly selected to receive either inquiry-based instruction or the subject matter approach to learning. The dependent variable in this study was students’ level of scientific reasoning. The greatest threat in this design type is that the differences found in the posttest are due to preexisting group differences, rather than due to the treatment (Gall, Borg, & Gall, 1996). The use of multiple classroom settings in this study reduced the risk of interaction of subjects, and the use of pretests of content knowledge addressed these concerns.

To ensure that teachers involved in this study were exhibiting the correct teaching methodology, teachers were asked to audiotape each class period during the duration of the study. The Science Teaching Inquiry Rubric (STIR) (Bodzin & Cates, 2002) was used to analyze the level of inquiry-based instruction. The STIR has been reported to have an overall correlation of $r = .58$ with a perfect correlation between two raters of $r = 1.00$, establishing the STIR as an effective analysis tool (Bodzin & Beerer, 2003). The researcher determined a priori, based on a study conducted by Thoron and Myers (2010), that students missing more than 25% of the instructional time during the study would be removed. Additionally, students that did not receive the treatment effectively would be removed from the sample.

All students were administered a pretest to establish a base line before each of the seven replications to measure content knowledge levels in the subject matter to be taught (soil and plant science). All sections were taught the same content by the same teacher and according to their randomly assigned group were taught one of the two teaching methods (inquiry or Subject–matter) the entire twelve weeks. Pretest instruments were developed by the researcher using content knowledge questions in the form of multiple choice items. The instruments contained a specific number of questions based on the determined percentage of time to be spent teaching each objective of the unit. The testing instruments were validated by a panel of agriscience education and inquiry education experts. Prior to the study, a coefficient alpha for the dichotomous data of the content knowledge achievement exams was calculated through a pilot test to assess reliability of the instruments (Campbell & Stanley, 1963). Reliability coefficients for the content knowledge achievement instruments were calculated using Kuder–Richardson 20 (KR20) for dichotomous data (Gall et al., 1996). The seven instruments were determined to have a coefficient alpha of: .94, .93, .91, .86, .87, .89, and .91 respectively. As such, each instrument was considered reliable.

Lawson’s Classroom Test of Scientific Reasoning (LCTSR) (Lawson, 1992) was used to assess scientific reasoning. The LCTSR is considered a reliable and valid instrument that measures levels of formal–operational scientific reasoning in secondary and college–age students. LCTSR is designed to assess scientific reasoning; therefore the instrument requires as little reading and writing as possible. Students are asked questions at Bloom’s (1956) cognitive behavior levels of analysis, synthesis, and evaluation. Lawson (1978) stated that the LCTSR measures the learner’s “...analysis of possible causal factors (combinatorial reasoning), the weighing of confirming and disconfirming cases (correlational reasoning), the recognition of the probabilistic nature of phenomena (probabilistic reasoning), and the eventual establishment of functional relationships between variables (proportional reasoning)” (p. 12).

The validity of the LCTSR was established by six experts in the area of Piagetian research who unanimously agreed that the test requires
concrete and formal reasoning. In addition, a Cronbach Alpha reliability coefficient of .86 was reported by the developer of the instrument. The Kuder–Richardson 20 reliability estimate for grade levels 8, 9, and 10 was reported as .78 (Lawson, 1978).

Findings

This study is part of a larger study conducted by the researcher. The results address the objectives and hypothesis of the study in determining the influence of teaching method, sex, ethnicity, social economic status, and year in school on student scientific reasoning. Objective one sought to describe the population of the study. The total group consisted of $N = 437$ students from ten different schools across the United States. Three teachers opted out of the study noting health related issues or teaching reassignment. As a result of teachers being unable to deliver instruction, 109 students were removed from the study. Twenty–three students were removed from the study due to missing 25% or more of instruction.

Audio recordings of the administered units were scored using the STIR rubric (Bodzin & Cates, 2002) to determine the level of inquiry investigation by students in the inquiry –based treatment group and that inquiry was not being delivered in the traditional treatment group. It was determined that all seven teachers effectively delivered inquiry–based and subject matter instruction. After removal of participants unable to complete the study and students missing more than 25% of the instructional time, the original sample was reduced to $n = 305$. This equates to a 30.21% mortality rate for this study. Previous experimental studies in agricultural education using intact classes reported similar or higher mortality rates (Boone, 1988; Dyer, 1995; Flowers, 1986; Myers, 2004) and Jurs and Glass (1971) described mortality rates may be as high as 50%.

Participant ethnicity was categorized into the groups of White (non–Hispanic) ($n = 249$, 81.6%), Black ($n = 13$, 4.3%), Hispanic ($n = 31$, 10.2%), and Other ($n = 12$, 3.9%). The ethnicity of each of the treatments was similar to the ethnicity of the entire sample. The majority of the participants in this study (58.0%) were male. The treatment groups were similar to each other as inquiry–based instruction contained 57.6% male and subject matter (SM) contained 58.5% male participants. Inquiry–based instruction yielded 170 participants and subject matter contained 135 students.

Of the 305 participants who reported grade level data, 48.5% ($n = 148$) were in the ninth grade. The remainder of the participants were either in tenth grade ($n = 134$, 44.0%), or eleventh grade ($n = 23$, 7.5%). There were no twelfth–grade students in the study. Grade level distribution by treatment groups varied little from that of the overall sample. Slightly more than 50% of the students in the inquiry–based group were in the ninth grade as compared to approximately 45% in the subject matter group. Treatment groups were similar in terms of grade level.

Socio–economic status (SES) was determined by eligibility to participate in the national free and reduced school lunch program (Stone & Lane, 2003). Therefore, SES was categorized in the groups of non–eligibility to participate, eligibility to receive reduced lunch, and eligibility to receive free lunch. The majority of the students participating in this study ($n = 221$, 72.5%) were not eligible to participate in the national school lunch program with 16.7% ($n = 51$) eligible to receive a reduced price in the school lunch program and the remainder ($n = 33$), 10.8% eligible to receive free lunch. Treatment groups were similar in terms of SES.

Objective two sought to ascertain the effects of inquiry–based instruction on scientific reasoning of high school agriscience students. Each student’s content knowledge achievement was determined using the researcher–developed content knowledge achievement instruments. The maximum possible score on these instruments was 100. Pretest data were collected from 305 participants (100%). Inquiry–based instruction treatment group achieved similar mean content knowledge pretest scores and similar standard deviations as the subject matter treatment group (see Table 1).
Table 1

Participant Mean Pretest Scores (n = 305)

<table>
<thead>
<tr>
<th>Content Knowledge Instrument</th>
<th>Treatment Group</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IBI</td>
<td>SM</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>1</td>
<td>35.57</td>
<td>11.68</td>
</tr>
<tr>
<td>2</td>
<td>35.72</td>
<td>12.78</td>
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<tr>
<td>3</td>
<td>31.20</td>
<td>11.06</td>
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<td>4</td>
<td>36.19</td>
<td>13.88</td>
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<tr>
<td>5</td>
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<tr>
<td>6</td>
<td>33.72</td>
<td>13.78</td>
</tr>
<tr>
<td>7</td>
<td>29.27</td>
<td>11.74</td>
</tr>
</tbody>
</table>

Note. IBI = Inquiry–based instruction; SM = Subject Matter

The LCTSR was used to determine the scientific reasoning of students following the treatments (subject matter and inquiry–based instruction). The LCTSR score of the participants was measured post–treatment using the LCTSR intact. The response rate for the scientific reasoning test was 93.4%. The overall mean score of the LCTSR was 36.77 (SD = 14.36) of a possible 100 (see Table 2). The mean LCTSR score was higher for the inquiry–based instruction (M = 41.44, SD = 14.18) than for subject matter instruction.

Objective three sought to examine the relationship between scientific reasoning, ethnicity, sex, year in school, and socio–economic status of high school agriscience students. Prior to any inferential analysis of the data, all variables were examined for correlations. For the purpose of discussion, the terminology proposed by Davis (1971) was used to indicate the magnitude of the correlations. Pearson Product Moment correlations were used to determine the relationships between the variables (see Table 3). Negligible correlations between all variables were found with the exception of the correlation between treatment and LCTSR score. The relationship between the LCTSR score and treatment r = –.37 was found to be moderate.

Table 2

Participant Mean Scientific Reasoning Scores

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Treatment Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IBI (n = 159)</td>
</tr>
<tr>
<td>LCTSR</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>41.44</td>
</tr>
</tbody>
</table>

Note. IBI = Inquiry–based instruction; SM = Subject Matter; LCTSR = Lawson’s Classroom Test of Scientific Reasoning
Table 3
Correlations Between Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. LCTSR Score</td>
<td>—</td>
<td>.03</td>
<td>-.02</td>
<td>.01</td>
<td>.02</td>
<td>-.37</td>
</tr>
<tr>
<td>2. Grade</td>
<td>—</td>
<td>-.03</td>
<td>-.04</td>
<td>-.06</td>
<td>.04</td>
<td>—</td>
</tr>
<tr>
<td>3. Sex</td>
<td>—</td>
<td>.03</td>
<td>.11</td>
<td>-.01</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>4. Ethnicity</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>5. SES</td>
<td>—</td>
<td>.05</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>6. Treatment</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Note. Treatment = Teaching method utilized

The null hypothesis states there is no significant difference in scientific reasoning based on teaching method. Students’ scientific reasoning score was determined by the LCTSR (Lawson, 1992). Students that were taught through inquiry–based instruction achieved a higher mean scientific reasoning score ($M = 41.44$) than students taught using the subject matter approach. The univariate analysis of covariance [$F(8,496) = 46.34, p \leq .001$] revealed significant differences in scientific reasoning at the alpha level of .05 between students taught by the two teaching methods (see Table 4). Based upon these findings, the null hypothesis of no significant difference in student scientific reasoning between the two groups was rejected.

Table 4
Univariate Analysis of Treatment Effects for Scientific Reasoning

<table>
<thead>
<tr>
<th>Source</th>
<th>Df</th>
<th>$F$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCTSR</td>
<td>2</td>
<td>46.34</td>
<td>$\leq .001$</td>
</tr>
</tbody>
</table>

Note. LCTSR = Lawson’s Classroom Test of Scientific Reasoning

Conclusions

Based on the results of this study there are three conclusions.

1. **Demographics:** A majority (81.6%) of the students involved in this study were White, non–Hispanic. The majority (58%) of the students in the study were male. Nearly half (48.5%) of the students were in the ninth grade. The second largest grade level represented was the tenth grade (44%) followed by the remainder of the sample in the eleventh grade (7.5%). A majority of the students participating in the study did not qualify for free or reduced lunch programs (72.5%), while just over one–quarter of the students were in a lower socioeconomic group. There were negligible variations across all the demographics for inquiry–based and subject matter treatment groups.

2. **Relationships of variables:** Student demographic variables reported low to negligible relationships with scientific reasoning and treatment. However, treatment and scientific reasoning had a moderate relationship. Based on the findings, the moderate relationship between the treatment and scientific reasoning concludes that treatment has an effect on the students’ level of scientific reasoning. It is also concluded that due to the fact that little to no relationship between other variables except the treatment group and scientific reasoning that any differences in students’ scientific reasoning ability would be largely attributed to the type of treatment.

3. **Students’ scientific reasoning ability:** Student scientific reasoning was determined through Lawson’s (1992) Classroom Test of Scientific Reasoning. Students taught using inquiry–based instruction achieved a higher mean LCTSR score ($M = 41.44$) than
students taught through the subject matter approach \( (M = 30.90) \). The univariate analysis of covariance revealed significant differences in scientific reasoning ability at the alpha level of .05 between students taught by the inquiry–based instruction and subject matter approach, \( F(8,496) = 46.34, p \leq .001 \). Based upon these findings, the null hypothesis of no significant difference in student scientific reasoning between the two groups was rejected.

**Discussion/Implications**

The finding that inquiry–based instruction (IBI) students achieved higher scientific reasoning scores than their counterparts learning through the subject matter (SM) approach is supportive of IBI containing multiple dimensions of teaching and learning and leading learners to think critically as they continue to focus on the ability to explain the process examined (Keil, Haney, & Zoffel, 2009). Scientific reasoning (SR) is the connection of the process of producing scientific knowledge through evidence–based reasoning (Schen, 2007). Lawson (1992) indicated students with a higher SR score changed their nonscientific beliefs the most. Developing students in agriculture and consumers with a higher scientific reasoning ability may lead to a society that considers factual evidence when making societal decisions.

A continued need exists for all elective subjects, including agriculture, to demonstrate value and contributions to student achievement in core subjects such as science (Odden, 1991). Myers (2004) noted studies have shown that agriscience students are more successful in science courses than students not enrolled in agriscience education. One could purport an expanded effort must be conducted by all elective subjects to document the contributions to student achievement in the areas of math, reading, and science. Results that increase SR through effective teaching in the context of agriculture place the agriscience profession to become integral to the local school–based curriculum.

This study found agreement with Means and Voss (1996) that stated reasoning skills and content knowledge are related. Students taught through IBI scored significantly higher on content knowledge exams and scientific reasoning (Thoron & Myers, 2011). This study found a moderate relationship between the method used and the scientific reasoning score. The acquisition of scientific reasoning does not call for a lack of focus on content knowledge. The NRC (2000) stated that inquiry–based instruction is a tool to provide students with the ability to transfer knowledge and this study indicated students can transfer IBI into higher scientific reasoning. The combination of Piaget’s (1972) theory of Cognitive Development and Vygotsky’s (1978) Sociocultural Theory created an interactive environment that allowed for adapting schemes through constructivism, resulting in a richness of knowledge based on scientific reasoning.

**Recommendations**

This study provides evidence of the effectiveness of inquiry–based instruction for school based agriscience education across the United States. Teacher educators will find the study useful in the selection of teaching methods. The results of this entire study could assist agricultural educators by identifying the key components to adapting curricula to inquiry–based instruction and the role that quality professional development has on scientific reasoning in agriscience. Based on the conclusions of this study, the following recommendations were made for teacher educators, curriculum developers, and practitioners in secondary school education:

1. Based on the finding that inquiry–based instruction is an effective method to deliver agriscience at the secondary school level, teacher educators should model inquiry–based instruction and provide practice in their preservice program.
2. Teacher educators should provide direct instruction for the development of higher scientific reasoning and argumentation skills in their preservice program and provide professional development for in–service teachers.
3. Agriscience courses should include direct instruction on argumentation skills and scientific reasoning.

**Recommendations for Further Research**

This study provides conclusions regarding its objectives and hypothesis, the study also developed recommendations for further research, including:

1. More experimental studies are needed in agricultural education investigating the most effective methods to teach agriscience education. Replication of this study involving a different group of teachers and different content focus will add to the body of knowledge for the profession.
2. Replication of this study comparing inquiry–based instruction with other teaching methods may provide insight into how to best teach agriscience.
3. The social cultural context (home and community) and its effects on student content scientific reasoning is warranted.
4. This study did not gather data on teacher perceptions of the two teaching methods under investigation. Further research should be conducted to determine the teachers’ perceptions and experiences of utilizing the teaching methods under investigation.

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Schen, M. S. (2007). *Scientific reasoning skills development in the introductory biology courses for undergraduates* (Unpublished doctoral dissertation). The Ohio State University, Columbus, OH.


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Multicultural Teaching Concerns: A Comparison Between Disciplines at the Secondary Pre–service Level

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*Arkansas Tech University*  
Robert M. Torres, Professor  
*University of Arizona*

Cultural diversity in secondary and postsecondary agricultural education programs lags behind recent demographic shifts in the general U.S. population. An examination of the literature provides inquiries into the need for teaching of multicultural awareness and reducing the achievement gap between students of various cultures. This research sought to summarize current concern levels secondary pre–service teachers have toward teaching in a multicultural classroom. Multicultural Teaching Concern was calculated based upon the summation of four constructs: familial/group knowledge, strategies and techniques, cross–cultural competencies, and school bureaucracy. Results indicate sex, home residency, and academic major play a role in the overall concern displayed. Secondary agricultural education pre–service teachers are not as concerned as secondary pre–service teachers from other disciplines. Recommendations for the selected institution include the development of an agricultural education multicultural course; the implementation of cultural immersion projects for students within the major; and professional development in multiculturalism among teacher educators.

Keywords: multicultural education, teaching concerns, teacher education, secondary

**Introduction**

The population of the United States continues to grow and expand more diverse in cultures (United States Census Bureau, 2006) over the last five years. In 2000, the United States Census Bureau issued a report detailing population numbers by ethnicity for 1980, 2000, and predicted values for 2020. Data analysis predicts the White population to be the only race to decline over the 40–year time–period. Identified with the largest increase in population growth within the United States is the Hispanic population with an 11.5% difference; followed by Asian (3.5%) and African–American (1.3%) populations.

Although the population of the United States continues to diversify, the same diversity trend is not observed among teachers within U.S. schools. In 2009, 6.9% of the total public school teacher population was African American while African American students constituted 15.7% of the total enrollment in public schools (Coopersmith, 2009; Keigher, 2009). Similar discrepancies are observed for other racial populations. These discrepancies are further amplified when research revealed in 2002 that nearly 40% of all schools in the United States do not have a single teacher of color (National Education Association, 2002). Bireda and Chait (2011) reported that the percentage of public schools now exceeds the 40%, which was reported in 2002. The nation’s largest urban public school systems (e.g. Chicago, Memphis,
Atlanta, Milwaukee) reported that in 2002, 69% of the student population was of color represented by only 35% teachers of color, (NCES, 2003). Now, teachers of color represent only 17% of the public school teacher population (Bireda & Chait, 2011).

Although race is an identifiable facet of culture, it is not the only identifier. In fact, culture is explained as the explicit statement of aspects such as the learned, socially shared, and variable nature of one’s experiences (Betancourt & López, 1993). Rohner (1984) proposed that culture represents design and ways of life and that each are transmitted from one generation to another. With these thoughts in mind, one could include economic status as a cultural element in a student population. The National Center for Education Statistics (2006) reported that 41.6% of the U.S.’s school-based student population qualifies for free or reduced price lunch.

Large gaps between the ethnic demographics of teachers and students in agricultural education, including the agriculture industry’s two largest states, California (Trexler et al., 2004) and Texas (Talbert & Larke, 1995). In addition to the lack of diversity in agriculture education and the major shift in the American culture, fair warning has been issued to the profession. Bowen and Rumberger (2002) reported that within this cultural shift comes a fundamental challenge: either aggressively pursue methods to draw a diverse pool of new teachers into the discipline, or remain a course of study with teachers whose demographics do not reflect the students they teach.

Throughout the agricultural education profession, presumptions can be made about the culture of pre-service agricultural education majors based upon former research (Joerger & Boettcher, 2000; Kantrovich, 2010; Rocca & Washburn, 2006). Roberts and Dyer (2002) developed 40 characteristics to describe the effective agriculture teacher. In the characteristics, none of the 40 represented a culturally competent teacher of diverse populations. Connors and Elliott (1995) concluded that although students enrolled in agriculture science classes did as well on state science examinations as students not enrolled in agriculture science; however, no increase was apparent with students from low socio-economic backgrounds. The outcome raises questions if pre-service agricultural education teachers are concerned, aware, or even preparing to teach students who are culturally different (i.e. ethnicity, SES, ability) than themselves.

Agriculture educators need to be alarmed about the level of concern that a pre-service teacher has in teaching culturally diverse populations. Spanierman et al. (2008) indicated that many students are arriving at racially diverse college settings, from mostly homogeneous White high schools, with little knowledge of or experience with people from diverse ethnic backgrounds. This should bring concern to teachers as they prepare students for a future beyond high school. In fact, Wehlage and Rutter (1986) attributed the student dropout rate to teacher concern levels. Fritz and Miller (2003) may have revealed a key contribution to the agricultural education profession in a 2003 study. They concluded that one in four female, pre-service teachers had concerns for self–adequacy, described primarily as survival concerns, in their teaching impact. Although valuable, these studies did not identify, nor did it seek, a level of concern among pre-service teachers toward teaching students of diverse cultures.

**Conceptual/Theoretical Framework**

The conceptual model is derived from Fuller, Parsons, and Watkins (1973). Francis Fuller, a clinical psychologist, developed a two-stage teaching concern model for the concerns of self and pupil (Fuller, 1969). Fuller’s research focus was on stages of concern in pre-service teachers and beginning teachers. Fuller identified numerous categories in teaching concern, and then grouped the specific categories into three stages: self–concerns, task concerns, and impact concerns (Fuller, Parsons, & Watkins, 1973).

Self–concerns relate to the teachers’ own worries about their ability to adequately perform and survive in the school environment (Marshall, 1996b). Task concerns regard daily teaching duties that pertain to the teaching methods and performance of the teacher. The final level of concern, impact, describes the
teacher’s apprehension toward the outcomes of the students learning needs (Srivastava, 2007).

The research literature has described the cultural elements of race and class by how teachers interact with students of a different race and class (Junor Clarke & Thomas, 2009; Kozol, 1992; Dusek & Joseph, 1985). In addition, research within the education profession has described how teachers’ concerns relate to what approaches they take in the delivery of content to students. Included in the literature are various areas of teaching concerns in pre-service science education (Gunstone, Slattery, Baird, & Northfield, 1993), horticulture teachers exploring mathematics enhancement (Jansen, Enochs, & Thompson, 2006), individuals teaching or not teaching five years after graduation (Marso & Pigge, 1995), and mathematics education teachers (Christou, Eliophotou–Menon, & Philippou, 2004). Although many of the sources are incredible references to enhance the performance of teacher education, none discuss the concerns that pre-service agriculture teachers have for teaching students of different cultures (sources studying cultural concerns).

**Purpose/Research Objectives**

The purpose of this descriptive–correlational study was to examine the level of concern toward teaching students of multiple cultures among pre-service teachers in agricultural education. The following research objectives and hypotheses guided the study:

1. Describe pre-service (agriculture and other secondary areas) teachers, at the University of Missouri in terms of race, sex, home residency, and family’s household income.
2. Describe pre-service teachers, at the University of Missouri, level of multicultural teaching concern within the four constructs (Familial/Group Knowledge, Strategies and Techniques, Cross–Cultural Competencies, and School Bureaucracy).
3. Describe the multicultural teaching overall concerns by the selected student characteristics (sex, race, home residency, and perceived family income).

Additionally, nine hypotheses were tested. For brevity, four hypotheses are collapsed into one and four into another.

H01, 02, 03, 04: The proportion of variance in the constructs (Familial/Group Knowledge01, Strategies and Techniques02, Cross–Cultural Competencies03, and School Bureaucracy04) of multicultural teaching concerns cannot be predicted by the linear combination of selected student characteristics (sex, race, home residence, and predicted family income).

HO5, 06, 07, 08: There was no statistically significant difference in the construct area (Familial/Group Knowledge05, Strategies and Techniques06, Cross–Cultural Competencies07, and School Bureaucracy08) for teaching multicultural students between secondary pre-service agricultural education teachers and other secondary pre-service teachers.

HO9: There was no statistically significant difference in the overall level of concerns for teaching multicultural students between secondary agriculture pre-service teachers and the other pre-service teachers.

**Methods/Procedures**

The assessable population of this descriptive–correlational study was secondary pre-service teachers at the University of Missouri whom were entering phase III (student teaching) of three teacher developmental program phases. The sample consisted of secondary pre-service teachers whom had completed their phase II of the teacher development program during the 2009 spring semester (n = 113). The pre-service teachers represented the seven secondary teacher certification areas (Agriculture, Art, English, Mathematics, Music, Science, and Social Studies) offered at the University of Missouri. The Associate Dean of Academic Programs in the College of Education granted access to pre-service teachers outside of Agricultural Education. Confirmation of participation was received following the approval of the lead faculty member of each phase II course. Faculty members from each phase II course set a desired meeting time and date for the researchers to distribute and collect the data collection instrument. The researchers began the collection...
The Multicultural Teaching Concerns Survey (MTCS) was used to measure the level of multicultural teaching concern as expressed by the pre-service teachers (Marshall, 1996a). Marshall (1996b) developed the MTCS, with modifications and further developments to Locke’s (1988) multicultural awareness model and Fuller and Brown’s (1975) three-stage teaching concern conceptualization: self, tasks, and impact. Four constructs comprised the MTCS and included measures reflecting teaching concerns related to Familial/Group Knowledge (the culture among diverse students’ families), Strategies and Techniques (effective teaching methods among different cultures), Cross-Cultural Competencies (teacher’s knowledge, skills, and beliefs toward different cultures), and School Bureaucracy (identifying attitudes of intolerance toward diverse cultures within a school). After an extensive amount of reliability testing, the MTCS revealed 34 questions: 14 in Familial/Group Knowledge, 10 in Strategies and Techniques, six in Cross-Cultural Competence, and four in School Bureaucracy (Marshall, 1996b).

A panel of experts (n = 6) with a similar research focus involving statistical and/or multicultural education at the University of Missouri reviewed the MTCS for face and content validity. To determine the reliability of the MTCS, it was piloted with pre-service students enrolled in a multicultural diversity education course at the same university who were not included in the study (n = 20). Reliability estimates were determined using a Cronbach’s alpha. The overall reliability estimate for the MTCS was .90. Reliability estimates were also determined for the four concern constructs: .73 for Familial/Group Knowledge, .82 for Strategies and Techniques, .87 for Cross-cultural Competence, and .51 for School Bureaucracy. The results were satisfactory, according to Nunnally and Bernstein (1994), except for School Bureaucracy. A panel of experts reexamined the School Bureaucracy anchor and restructured wording and sentence structure to minimize error, but did not develop critical change that would affect the overall score of the instrument.

Following revision, the School Bureaucracy construct received a new reliability estimate of .68. Pre-service teachers completing the questionnaire were asked to rate their concern level to various questions on a 5-point Likert scale ranging from “extremely important” to “extremely unimportant”.

Following the data collection period, data were coded and entered into SPSS. Descriptive statistics of central tendency and variability were calculated to summarize the data. According to Oliver and Hinkle (1982), it is reasonable to argue that a well-established cohort of subjects in any given year is likely to be representative of a cohort of similar nature and location in near future years. Inferential analyses were applied to the data in an effort to predict the concern of similar cohort grouping of pre-service teachers within the same university.

Independent sample $t$-tests and ANOVA were conducted to test differences on the MTCS, and stepwise multiple linear regressions was calculated to estimate the variance in the four constructs for teaching multicultural students (Familial/Group Knowledge, Strategies and Techniques, Cross-Cultural Competencies, and School Bureaucracy) as explained by pre-service teacher selected predictor characteristics. Effect sizes were calculated using Cohen’s (1988) $d$ coefficients and interpreted by Thalheimer and Cook (2002): negligible effect size ($d < 0.15$), small effect size ($d < 0.40$), medium effect size ($d < 0.75$), large effect size ($d < 1.10$), very large effect size ($d < 1.45$), and huge effect size ($d > 1.45$). An alpha level of .05 was established a priori for tests of significance.

Because the sample of pre-service teachers were unequally represented across disciplines, assumptions of normality and equal variance were tested. A two-sample Kolmogorov–Smirnov test was conducted to validate the assumptions of normality. The results indicated ($p = .62$) that the data were indeed normal, thereby allowing for the use of two-sample $t$-test. A normal probability plot indicated that the variables met the assumptions of normality, thereby allowing the use of ANOVA.
Results/Findings

Research objective one sought to describe the selected characteristics (race, gender, home residency, and family’s household income) by secondary agriculture ($n = 24$) and other secondary pre–service teachers ($n = 89$). Female pre–service teachers outnumbered male pre–service teachers in both secondary agriculture ($n = 17; 70.80\%$) and other secondary pre–service teachers ($n = 52; 58.40\%$). Secondary agriculture pre–service teachers were homogenous in race (White; $n = 24; 100.00\%$) while other secondary pre–service teachers had a slight diverse composition with White as the dominant race ($n = 75; 84.30\%$) followed by Asian ($n = 5; 5.60\%$), African American ($n = 5; 5.60\%$), Hispanic ($n = 3; 3.40\%$), and American Indian ($n = 1; 1.10\%$). All pre–service secondary agriculture teachers ($n = 24; 100.00\%$) considered their home residence to be located in a rural setting, while the majority of other secondary pre–service teachers identified home residence as suburban ($n = 60; 67.40\%$) rather than rural ($n = 19; 21.30\%$) and urban ($n = 10; 11.20\%$). A discrepancy in perceived family income existed between the two pre–service teachers grouping. Thirteen of the 24 (54.20\%) agricultural education pre–service teachers perceived their family’s household income to be within the range of $35,000 to $49,999, while the majority of other secondary pre–service teachers ($n = 31; 34.80\%$) perceived their family household income to be $100,000 or greater (see Table 1).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Agriculture Pre–service</th>
<th>Other Pre–service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>$f$</td>
<td>$%$</td>
</tr>
<tr>
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<td>17</td>
<td>70.80</td>
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<tr>
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<td>100.00</td>
</tr>
<tr>
<td>African American</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Asian</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>American Indian</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Home Residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>24</td>
<td>100.00</td>
</tr>
<tr>
<td>Suburban</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Urban</td>
<td>10</td>
<td>11.20</td>
</tr>
<tr>
<td>Perceived Family Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; $35k</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>$35k – $49,999</td>
<td>13</td>
<td>54.20</td>
</tr>
<tr>
<td>$50k – $74,999</td>
<td>7</td>
<td>29.20</td>
</tr>
<tr>
<td>$75k – $99,999</td>
<td>2</td>
<td>8.30</td>
</tr>
<tr>
<td>$100k ≥</td>
<td>2</td>
<td>8.30</td>
</tr>
</tbody>
</table>

The majority of the secondary pre–service teachers who were completing Phase II at the University of Missouri were agriculture ($f = 24; 21.20\%$) and social studies ($f = 24; 21.20\%$) followed by English ($f = 19; 16.80\%$), math ($f = 15; 13.30\%$), science ($f = 13; 11.50\%$), music ($f = 10; 8.80\%$), and art ($f = 8; 7.10\%$). To gain a better view of the pre–service teachers’ certification area, Table 2 serves as a summary of the academic areas represented in the study.
Table 2
Certification Area of Secondary Pre-service Teachers (n = 113)

<table>
<thead>
<tr>
<th>Secondary Certification Area</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>24</td>
<td>21.20</td>
</tr>
<tr>
<td>Social Studies</td>
<td>24</td>
<td>21.20</td>
</tr>
<tr>
<td>English</td>
<td>19</td>
<td>16.80</td>
</tr>
<tr>
<td>Math</td>
<td>15</td>
<td>13.30</td>
</tr>
<tr>
<td>Science</td>
<td>13</td>
<td>11.50</td>
</tr>
<tr>
<td>Music</td>
<td>10</td>
<td>8.80</td>
</tr>
<tr>
<td>Art</td>
<td>8</td>
<td>7.10</td>
</tr>
</tbody>
</table>

For research objective two, pre-service teachers’ levels of concern were broken down into the four constructs (Familial/Group Knowledge, Strategies and Techniques, Cross-Cultural Competence, and School Bureaucracy). According to the grand mean scores, pre-service teachers at the University of Missouri revealed the highest concern in the construct area of Familial and Group Knowledge ($m = 4.07; SD = 0.59$) followed by Concerns for Strategies and Techniques ($m = 3.98; SD = 0.64$), School Bureaucracy ($m = 3.65; SD = 0.80$), and Cross-Cultural Competence ($m = 3.20; SD = 0.95$), which is provided in Table 3.

Table 3
Familial/Group Knowledge; Strategies & Techniques; Cross-Cultural Competence; and School Bureaucracy Mean Concern Scores (n = 113)

<table>
<thead>
<tr>
<th>Cultural Competency</th>
<th>Mean Score</th>
<th>SD</th>
<th>Grand Mean</th>
<th>Grand SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familial/Group Knowledge</td>
<td>24.40</td>
<td>3.53</td>
<td>4.07</td>
<td>0.59</td>
<td>14.00–30.00</td>
</tr>
<tr>
<td>Strategies and Techniques</td>
<td>55.71</td>
<td>8.95</td>
<td>3.98</td>
<td>0.64</td>
<td>20.00–70.00</td>
</tr>
<tr>
<td>School Bureaucracy</td>
<td>14.61</td>
<td>3.19</td>
<td>3.65</td>
<td>0.80</td>
<td>6.00–20.00</td>
</tr>
<tr>
<td>Cross-Cultural Competence</td>
<td>32.02</td>
<td>9.54</td>
<td>3.20</td>
<td>0.95</td>
<td>10.00–50.00</td>
</tr>
</tbody>
</table>

*Out of 30 Points; "Out of 70 Points; ‘Out of 20 Points; "Out of 50 Points; Scale based on: 1 = Extremely Unimportant to 5 = Extremely Important

Research objective three sought to describe the overall concern level of the pre-service teachers based upon the characteristics of gender, race, home residence, and perceived family income (see Tables 4 and 5). In teaching multicultural students, Female pre-service teachers are overall more concerned ($M = 130.04; SD = 18.48$) than male pre-service teachers ($M = 121.55; SD = 21.92$) (see Table 4). An independent samples (two-tailed) $t$ - test revealed a significant difference ($t = 2.22; p < .05$) in level of concern held by female and male pre-service teachers with a medium effect size ($d = 0.43$).

Table 4
Two-Tailed Independent Sample $t$-test on Level of Teaching Concern by Sex (n = 113)

<table>
<thead>
<tr>
<th>Sex</th>
<th>n</th>
<th>$M$</th>
<th>SD</th>
<th>$t$</th>
<th>$p$</th>
<th>Cohen’s $d$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>69</td>
<td>130.04</td>
<td>18.48</td>
<td>2.22</td>
<td>.03*</td>
<td>0.43</td>
</tr>
<tr>
<td>Male</td>
<td>44</td>
<td>121.55</td>
<td>21.92</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*$p \leq .05$
In addition to the sex of pre-service teachers, the remaining characteristics were evaluated as multichotomous variables. To complete research objective three, an univariate linear 3-way ANOVA model was conducted to determine the differences in overall level of concern for teaching students of different cultures by race, home residence, and perceived family income (see Table 5). No significant difference ($p > .05$) in overall level of concern was found among the pre-service teachers’ family income, however, a significant difference ($p < .05$) in home residency was found. Due to concerns toward the unequal group size in race, a test of significance was not calculated rather, descriptive measures are provided in Table 5.

### Table 5
**ANOVA of Concern Scores by Pre-service Teacher Characteristics** ($n = 113$)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>$n$</th>
<th>$M$</th>
<th>$SD$</th>
<th>$F$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>99</td>
<td>126.43</td>
<td>19.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>5</td>
<td>133.80</td>
<td>28.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>5</td>
<td>127.20</td>
<td>34.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>3</td>
<td>133.33</td>
<td>10.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian</td>
<td>1</td>
<td>99.00</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Home Residence</strong></td>
<td></td>
<td></td>
<td></td>
<td>4.23</td>
<td>.01*</td>
</tr>
<tr>
<td>Rural</td>
<td>43</td>
<td>122.81</td>
<td>19.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suburban</td>
<td>60</td>
<td>126.85</td>
<td>20.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>10</td>
<td>142.90</td>
<td>16.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Perceived Family Income</strong></td>
<td></td>
<td></td>
<td></td>
<td>0.73</td>
<td>.57</td>
</tr>
<tr>
<td>$&lt; $35k</td>
<td>2</td>
<td>125.00</td>
<td>28.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$35k – $49,999</td>
<td>25</td>
<td>128.28</td>
<td>16.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$50k – $74,999</td>
<td>31</td>
<td>129.13</td>
<td>18.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$75k – $99,999</td>
<td>22</td>
<td>126.41</td>
<td>20.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$100k ≥</td>
<td>33</td>
<td>123.64</td>
<td>20.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intercept</strong></td>
<td></td>
<td>420.28</td>
<td></td>
<td></td>
<td>.01*</td>
</tr>
</tbody>
</table>

Home Residence: $F(2,110) = 4.23$, Adjusted $\eta^2 = .07$; $*p \leq .05$

A Levene’s test revealed that an equal variance was assumed in the characteristic of home residency on the overall multicultural teaching concern score. Hochberg’s GT2, post hoc, pair-wise comparison was utilized because of the unequal sample size between rural, suburban, and urban students. Hochberg’s GT2 provides a calculation for the honest significant difference to address Type I error (Field, 2000). Results display a significant difference ($p < .05$) in the overall concern level among urban/suburban and urban/rural pre-service teachers (see Table 6).

### Table 6
**Hochberg’s GT2 Post hoc Pair-wise Comparison of Overall Concern Level by Home Residence**

<table>
<thead>
<tr>
<th>Home Residence</th>
<th>Mean Difference</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suburban / Rural</td>
<td>4.04</td>
<td>.66</td>
</tr>
<tr>
<td>Urban / Suburban</td>
<td>16.05</td>
<td>.05*</td>
</tr>
<tr>
<td>Urban / Rural</td>
<td>20.09</td>
<td>.01*</td>
</tr>
</tbody>
</table>

* $p \leq .05$
To test hypotheses 01, 02, 03, and 04, stepwise multiple linear regressions were utilized to predict the antecedents of pre–service teachers’ level of concern for teaching multicultural students in the four teaching concern constructs (Familial/Group Knowledge, Strategies and Techniques, Cross–Cultural Competencies, and School Bureaucracy) that can be predicted by their characteristics (race, certification area, sex, home residency, and family’s household income). For race, subjects were dichotomized as either White or Not White (African–American, Asian, Hispanic, and Native American) and the academic certification areas were dichotomized as Agricultural Education or Other Secondary Areas (Social Studies, English, Mathematics, Science, Music, and Art). Intercorrelations were calculated to check for multicollinearity. According to Berry and Feldman (1991), bivariate correlations between independent variables yielding a .80 or higher were considered to display a high degree of multicollinearity. No multicollinearity issues were observed in each of the multiple regression analyses. Tables 7 and 8 display the results of the analyses.

It was revealed that nine percent of the variance of pre–service teachers’ concern in Familial/Group Knowledge (see Table 7) construct (F(2,112) = 5.48; p ≤ .05) was predicted by their sex (β = -.24; p ≤ .05) and certification area (β = .21; p ≤ .05). Home residency, race, and perceived family income were non–significant predictors. Concern for using Strategies and Techniques (see Table 8) to teach multicultural students (F(5,112) = 10.65; p ≤ .05) was predicted by their home residency (β = .30; p ≤ .05), certification area (β = .18; p ≤ .05), and sex (β = -.25; p ≤ .05). Null hypotheses 01 and 02 were rejected in favor of the alternative hypotheses that the proportion of variance in Familial/Group Knowledge and Strategies and Techniques is explained by the linear combination of characteristics.

### Table 7
**Stepwise Regression of Familial Group Knowledge Concern (n = 113)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>R</th>
<th>R²</th>
<th>b</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristics</td>
<td>.30</td>
<td>.09</td>
<td>-1.71</td>
<td>-.24</td>
<td>-2.59</td>
<td>.01*</td>
</tr>
<tr>
<td>Sexa</td>
<td>1.83</td>
<td>.21</td>
<td>2.33</td>
<td>.02*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certificationb</td>
<td>23.62</td>
<td>32.82</td>
<td>.01*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. Adjusted R² = .07; For Model: F(2,112) = 5.48; *p ≤ .05; aSex Coded: Female = 0; Male = 1
bCertification Area: Agricultural Education = 0; Other Secondary Areas = 1

### Table 8
**Stepwise Regression of Strategies and Techniques Concern (n = 113)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>R</th>
<th>R²</th>
<th>b</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristics</td>
<td>.40</td>
<td>.16</td>
<td>4.38</td>
<td>.30</td>
<td>3.48</td>
<td>.01*</td>
</tr>
<tr>
<td>Home Residencec</td>
<td>3.93</td>
<td>.18</td>
<td>1.56</td>
<td>.02*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certificationb</td>
<td>-4.49</td>
<td>-.25</td>
<td>-2.81</td>
<td>.01*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexa</td>
<td>54.36</td>
<td>39.90</td>
<td>.01*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Adjusted R² = .15; For Model: F(5,112) = 10.65; *p ≤ .05; aSex Coded: Female = 0; Male = 1;
bCertification Area: Agricultural Education = 0; Other Secondary Areas = 1; cHome Residence: Rural = 0; Suburban = 1; Urban = 2
As noted in Table 7, the Familial/Group Knowledge construct is explained by sex and certification area. The table provides information that pre-service agriculture male teachers have significantly lower multicultural concern for familial/group knowledge than another group. Table 8 shows that home residence, certification area, and sex play a significant role in their multicultural concern for the strategies and techniques in teaching students of a different culture.

Hypotheses 03 and 04 state, the proportion of variance in the construct areas (Cross-Cultural Competencies and School Bureaucracy) of multicultural teaching concerns is not explained by the linear combination of the demographic characteristics. Using stepwise multiple linear regression, no unique variance was explained in each construct area resulting in a failure to reject null hypotheses 03 and 04.

Two-tailed, independent t-tests were calculated to test hypotheses 05, 06, 07, and 08. Each hypothesis sought to determine if significant differences existed between secondary pre-service agriculture teachers and other secondary pre-service teachers by each construct of multicultural teaching concern (Familial/Group Knowledge, Strategies and Techniques, Cross-Cultural Competence, and School Bureaucracy). Table 9 provides the results. As noted in the concern construct Familial/Group Knowledge, other secondary pre-service teachers received a mean score of 24.74 (SD = 3.72) which is significantly (p < .05) higher than agriculture pre-service teachers (M = 23.13; SD = 2.38) with a medium effect size (d = 0.47). Therefore, for Familial/Group Knowledge, equal variance is assumed with a significant t-value of -2.02.

Other secondary pre-service teachers (M = 56.76; SD = 9.20) responded that they were more concerned than agriculture pre-service teachers (M = 51.79; SD = 9.20) in the construct area of Strategies and Techniques (see Table 9). The difference was significant (p < .05) with a medium effect size (d = 0.55). Equal variance was not assumed, yielding a significant t-value of -2.83.

Significant difference was found in the independent t-test on the constructs of Familial/Group Knowledge and Strategies and Techniques. Null hypotheses five and six were rejected in favor of the alternative hypotheses which state differences do exist in the constructs of concern between pre-service secondary agriculture teachers and other pre-service secondary teachers. For the constructs of Cross-Cultural Competence and School Bureaucracy concerns, a significant difference was not found (p < .05). Therefore, null hypotheses 07 and 08 were not rejected.

Table 9
Two-Tailed Independent t-test on Multicultural Teaching Concern Constructs of Pre-service Secondary Teachers (n = 113)

<table>
<thead>
<tr>
<th>Concern Constructs</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
<th>Cohen's d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familial/Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>24</td>
<td>23.13</td>
<td>2.38</td>
<td>-2.02</td>
<td>.04*</td>
<td>0.47</td>
</tr>
<tr>
<td>Other Secondary</td>
<td>89</td>
<td>24.74</td>
<td>3.72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategies/Techniques</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>24</td>
<td>51.79</td>
<td>9.20</td>
<td>-2.83</td>
<td>.01*</td>
<td>0.55</td>
</tr>
<tr>
<td>Other Secondary</td>
<td>89</td>
<td>56.76</td>
<td>9.12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross Cultural Competence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>24</td>
<td>31.83</td>
<td>9.20</td>
<td>-0.11</td>
<td>.91</td>
<td>0.03</td>
</tr>
<tr>
<td>Other Secondary</td>
<td>89</td>
<td>32.07</td>
<td>9.68</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School Bureaucracy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>24</td>
<td>13.96</td>
<td>3.34</td>
<td>-1.09</td>
<td>.28</td>
<td>Small</td>
</tr>
<tr>
<td>Other Secondary</td>
<td>89</td>
<td>14.79</td>
<td>3.14</td>
<td></td>
<td></td>
<td>0.26</td>
</tr>
</tbody>
</table>

*p < .05
Hypothesis 09 is better explained in Table 10, which includes the one-way ANOVA findings for overall multicultural teaching concern levels in pre-service teachers. The overall model was found to be significant ($p < .05$). The test of significance lead to rejecting null hypothesis 09 in favor of the alternative hypothesis suggesting there is a difference in the overall level of concerns for teaching multicultural students among the secondary pre-service teachers. A significant difference among

the group variance existed and as the result of the Levene’s test, equal variance was assumed leading to performing a Tukey, post-hoc, pair-wise comparison (Table 11). Tukey post-hoc was utilized as a relatively conservative approach to addressing Type I error (Field, 2000). The Tukey post-hoc comparison revealed a significant difference in overall multicultural teaching concern scores between secondary Agriculture/Social Studies, Agriculture/Art, and Agriculture/English pre-service teachers.

Table 10

<table>
<thead>
<tr>
<th>Certification Area</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>24</td>
<td>120.71</td>
<td>17.47</td>
<td>3.97</td>
<td>.01*</td>
</tr>
<tr>
<td>Social Studies</td>
<td>24</td>
<td>133.08</td>
<td>17.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>19</td>
<td>137.63</td>
<td>15.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td>15</td>
<td>114.67</td>
<td>23.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science</td>
<td>13</td>
<td>116.54</td>
<td>17.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Music</td>
<td>10</td>
<td>129.00</td>
<td>25.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Art</td>
<td>8</td>
<td>136.25</td>
<td>17.94</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. Certification Area: $F(6,112) = 3.97$; *$p \leq .05$; Adjusted Eta* = .14

Table 11

<table>
<thead>
<tr>
<th>Certification Area</th>
<th>Mean Difference</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture / Math</td>
<td>6.04</td>
<td>.96</td>
</tr>
<tr>
<td>Agriculture / Science</td>
<td>4.17</td>
<td>.99</td>
</tr>
<tr>
<td>Agriculture / Music</td>
<td>-8.29</td>
<td>.90</td>
</tr>
<tr>
<td>Agriculture / Social Studies</td>
<td>-12.38</td>
<td>.05*</td>
</tr>
<tr>
<td>Agriculture / Art</td>
<td>-15.54</td>
<td>.04*</td>
</tr>
<tr>
<td>Agriculture / English</td>
<td>-16.92</td>
<td>.03*</td>
</tr>
</tbody>
</table>

*p \leq .05

Conclusions/Implications/Recommendations

An overall objective for agricultural education is to prepare youth for working in a diverse labor market (Doerfert, 2011). Although, the analysis of the current pre-service teachers enrolled in agricultural education (Kantrovich, 2010) can be identified with homogenous characteristics (i.e. rural and White) it does not imply that their classroom will mirror a similar culture (Bowen & Rumberger, 2002). Therefore, it is imperative that a teacher gain an understanding for cultural awareness and be able to develop youth competency in diversity; but they must first have a concern for doing so (Marshall, 1996a). The purpose of this study was to see if pre-service agricultural education students at the University of Missouri were concerned for the diverse culture of their classroom, as compared to their other pre-service teaching colleagues.
The concern construct area of Familial/Group Knowledge received the highest concern score held by pre–service teachers; followed closely by their concern toward the Strategies and Techniques in teaching multicultural students. The College of Education at the University of Missouri places an emphasis on cultural teaching strategies and techniques through a teaching certification mandated course. Because of this effort, it implies Strategies and Techniques for teaching culturally diverse students are being addressed. The high concern scores towards a student’s family and group knowledge is due to the emphasis the college makes on recognizing family and home backgrounds/lifestyles as a pivotal piece of teaching to diverse students. To capitalize on the two high concerns construct areas, it is recommended that the College of Education begin to address the constructs by preparing pre–service teacher’s efficacy level in various classroom strategies and techniques that benefit different cultures as well as helping students realize that their own personal upbringing helped define their own characteristic and bias.

The lowest two concern construct areas, School Bureaucracy and Cross–Cultural Competence, suggest that a greater level of awareness is needed before an efficacy level is addressed. To build pre–service teachers’ concern levels, it is recommended that educators provide students with opportunities to work and observe in schools with various cultures that allow a stronger understanding. In addition, qualitative interviews of teachers, administrators, and students from schools of multi–cultures will help in the education process that will reflect a higher concern in cross–cultural competence and school bureaucracy.

Female and male pre–service teachers differ significantly on the overall concern level of teaching multicultural students, where females appear to have the higher level of concern. It is possible that females’ concern scores are higher due to their nurturing character or their cautious behavior. Although research implies that race of a teacher affects the educational outcome of the teacher (King, 1993), there was no significant relationship between pre–service students’ race and their overall concern level in teaching multicultural students. However, this might be due to the homogenous nature of the pre–service teachers in the study. Urban students differ significantly on their overall level of concern from the suburban and rural pre–service teachers. This implies that rural pre–service teachers may have a narrow definition of culture as a subject of race, which they received minimal association with as opposed to students from an urban background. It is recommended that the college educators strengthen their efforts to educate students about various cultures in a classroom setting. In addition, it is recommended that male pre–service teachers at the University of Missouri receive additional opportunities to practice teaching in more diverse schools. It is further recommended that teacher educators at the University of Missouri provide all pre–service teachers with experiences in a culturally diverse school through service learning hours, field experience hours, and practical teaching experiences. Rehm and Allison (2006), provide a great example. They measured a high level of cultural competence among Family and Consumer Science students when service learning experiences, teaching observations, and teaching practices in multi–diverse schools were increased.

When attempting to predict students’ teaching concern levels from the four concerns constructs (Familial/Group Knowledge, Strategies and Techniques, Cross–Cultural Competence, and School Bureaucracy), two were found to be significant (Familial/Group Knowledge and Strategies and Techniques) predictors. Female pre–service teachers in a certification area other than agriculture have the highest level of concern for the Familial/Group Knowledge construct area. This implies that agriculture pre–service teachers at the University of Missouri anticipate a teaching job similar or close to their home residence. This anticipation provides agriculture pre–service teachers with an assumption that the classroom students’ family and group background will be similar to their own. The opposite appears to be true with secondary pre–service teachers that represent the other certification areas. These students showcase a higher concern toward the possibility that their students’ family and group background could be different from their own.
In addition, the higher concern provides educators with the information that the pre-service teacher is more capable to obtain techniques that may address the concern (Marshall, 1996b). It is recommended that agriculture teacher educators at the University of Missouri help their pre-service teachers identify the cultures they are accustomed to and then immerse them in various family and group lifestyles. Possibilities for obtainment are through student teaching placements at multicultural communities or through the engagement of multicultural experiences.

The second concern construct that was significant addresses the strategies and techniques utilized in teaching students of different cultures (Strategies & Techniques). It is concluded that urban, female pre-service teachers from a certification area other than agriculture have the greatest level of concern. This implies that agriculture pre-service teachers who are male, at the University of Missouri, are disadvantaged versus their other content area colleagues. It is recommended that efforts be made to offer experiences that provide greater understanding of the different strategies and techniques that are successful among different cultures. Agriculture pre-service teachers, especially males, need experiences that allow each to practice the strategies and techniques among students of different cultures. It is recommended that these obtained strategies and techniques be practiced in classrooms representing diverse cultures. Opportunities to obtain strategies and techniques among diverse cultures include, but are not limited to: urban schools, study abroad experience, secondary classrooms in art, social studies, or English.

In the constructs of Familial/Group Knowledge and Strategies and Techniques, pre-service agriculture teachers are significantly less concerned than their other secondary colleagues are. A medium effect size exists in the variance of Familial/Group Knowledge and Strategies and Techniques, while a small effect size in the variance of School Bureaucracy exists between agriculture and other secondary pre-service teachers. Overall, this suggests that the agricultural education department at the University of Missouri should provide more opportunities for their pre-service teachers to understand diverse cultures and identify the best practices for teaching students who are culturally different from themselves. It is recommended that teacher educators provide pre-service teachers with opportunities to obtain field experience hours at urban and rural secondary agriculture programs that showcases an enrollment of diverse cultures.

Although agriculture pre-service teachers provided an overall concern score lower than the majority of their peers, a significant difference was found between pre-service agriculture teachers and the pre-service teachers in the areas of social studies, English and art. This implies that the social studies, English, and art departments at the University of Missouri might be encouraging students to understand diverse cultures and understand the benefit of teaching to all students. Social studies and English pre-service teachers represent core content area classrooms that embody every student in a school. It would benefit agricultural teacher educators to collaborate with social studies, English, and art teacher educators in developing collaborative practices and professional development opportunities for agriculture pre-service teachers. The development of secondary courses, such as Global Agriculture, Agriculture Biology, and Rural Writing, could serve as a beneficial, cross-curricular, course that is co-taught by all disciplines.

A concern for teaching students of multiple cultures is a beginning step for obtaining cultural competence (Locke, 1988), but it is not the solution nor can it be developed in a simple course. Therefore, teacher educators at the University of Missouri are recommended to implement various techniques and methods, throughout a pre-service teacher’s coursework that stimulates concerns and addresses techniques for implementation. Although, many teacher educators may not be competent in such practice, scholars provide a plethora of theoretical development in the progression of building teachers’ cultural awareness and competence (Banks & Banks, 2010; Timpson, Canetto, Borrayo, & Yang, 2003).
Recommendations for Further Research

Further research should examine why differences exist among multicultural teaching concern levels in the academic areas. Other independent variables that may have an effect on an individual’s concern level (i.e. interaction with students of different culture, cumulative grade point average, and whether the student continues to commute from home or not) needs to be examined. Based upon the literature review, it is assumed that higher concern for teaching students of a different culture will result in an increased enrollment of students from diverse cultures. Some pre-service agriculture teachers may lack concern due to a lack of interaction with culturally different students in their upbringing. Qualitative research should be conducted to determine this phenomenon.

References


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College Major Choice for Students of Color: Toward a Model of Recruitment for the Agricultural Education Profession

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The purpose of this study was to gain a deeper understanding of the reasons students, identifying as non-White, made the decision to pursue a career in agricultural education. This phenomenological study allowed the researchers to obtain the overall phenomenon of the thought processes that encompass decisions of students of color when selecting an academic major in college. Participants described having external and internal value orientations toward college major choice. When a value orientation increased toward a major prior to college, participants tended to be more apt to pursue a specific degree program. It was concluded that in addition to particular value orientations, distinct barriers to the decision-making process also inhibit the choice of agricultural education.

Keywords: recruitment; students of color; barriers, self-determination; diversity

Introduction/Theoretical Framework

The population of the United States continues to grow and expand into diverse cultures (US Census, 2008). In 2008, the United States Census Bureau (USCB) issued a report detailing population predictions by ethnicity from 2010 to 2050. From the report, the USCB predicted the White population to have the lowest increase (1.3%) of 2.48 million people over the 40-year time-period. The Hispanic population numbers included the largest population increase with a 62.5% (83 million) difference in population growth from 2010 to 2050, followed by Asian populations with increases of 32.2% or 19.3 million people and finally African Americans with a 26.8% or 10.7 million predicted population growth by 2050.

With the population of the United States continuing to diversify by race, the enrollment trends for secondary school students reflects a similar trajectory (Davis & Bauman, 2011). However, similar predictions are not true regarding the diversity of teachers employed at U.S. schools. In 2009, 6.9% or nearly 234,000 of the total teacher population in public schools, were African American, yet African American students, in public schools, constituted 15.7% of the total student enrollment (Coopersmith, 2009; Keigher, 2009). Hispanic student enrollment in public and private secondary schools accounted for 23.8% of enrollment populations, which was an increase from 11% in 1991, and Asian student enrollment totaled 4.4% of the student population in schools. Conversely, Hispanic teachers represented 7.1% of all secondary school teachers and Asian teachers represented 1.2% of secondary school teachers. White students represented 58.2% of the students enrolled in secondary school, which was down from 69.6% in 1991, while White teachers represented 83.3% of the total teacher
population employed in all secondary schools throughout the United States (Coopersmith, 2009; Keigher, 2009).

The enrollment statistics and employment statistics in United States public schools reveal a gap between the cultural diversity of teachers and the students enrolled in their classes. The lack of teachers representing diverse cultures exists within agricultural education as well. In a 2005 study, 93.4% \((n = 198)\) of preservice teachers in agricultural education reported to be White, non–Hispanic, followed by 2.4% Hispanic \((n = 5)\), 1.4% \((n = 3)\) African American and 0.9% \((n = 2)\) Asian American (Rocca & Washburn, 2008). Nearly 95% of preservice teachers in agricultural education are from rural and suburban areas. Rural and suburban areas subsequently represent a majority of White non–Hispanic populations (Dilworth, 1989), which perpetuates the cycle of misrepresentation in ethnicity between teachers and students (Coopersmith, 2009). In a census study of all agricultural teacher education programs over the past five years, a 50% decrease has occurred in the ethnicity of students entering agricultural education teacher preparation programs (Kantrovich, 2007; 2010).

An understanding of the disparity between the cultural representation among students and teachers in American public schools is significant because the cultural background of individuals in power positions has been demonstrated to matter. Previous studies have concluded that agriculturalists from diverse ethnic backgrounds are key role models in helping students of color overcome stereotypes about agricultural sciences (Bowen & Rumberger, 2002; Kandel & Cromartie, 2004; Larke & Barr, 1987; Mullinix, Garcia, Lewis–Lorentz, & Qazi, 2006). The influence of teachers of color has been known to contribute to decreased dropout rates and increased engagement among students of color (Franklin, 1990; Gomez & Rodriguez, 2011; Southern, 1990). Professional organizations such as Minorities in Agriculture, Natural Resources, and Related Sciences (MANRRS) have been noted as successful organizational examples that increase participation and success for students of color at the postsecondary level (Bowen & Rumberger, 2002; Talbert, Larke, & Jones, 1999). Conversely, literature exists that purports the race of the teacher had minimal influence on the enrollment in secondary agricultural education classes; however, the ability for the teacher to relate socially and culturally with the students of color had major impact on enrollment (Jones & Bowen, 1998).

To date, there is no definitive strategy for closing the ethnic gap in agricultural education between teachers and students or employers and employees. However, those who study this issue might agree that addressing various socialization factors is paramount to understanding why students of color select particular careers (Bowen & Rumberger, 2002; Mason & Hansen, 2004). Socialization is the process through which individuals learn and internalize social values and perceptions in order to function effectively in society. Previous studies investigating influences in career planning posit factors related to socialization serve as the underpinnings for academic major selection (Guay, Senécal, Gauthier, & Fernet, 2003; Kuijpers, Meijers, & Gundy, 2011; Toyokawa & McLoyd, 2011). These factors include parental education level, parental income level, father’s employer, substantive early exposure starting at the middle school level, career opportunities as influences in career choices, and motivational habits at the high school and college levels (Anderson & Kim, 2009; Esters & Bowen, 2004; Esters & Bowen, 2005; Jones & Bowen, 1998; Mason & Hansen, 2004; Talbert & Larke, 1995).

Although the educational literature outside agricultural education, including career and technical education, has examined teacher recruitment in underrepresented populations (Irvine, 1988; Torres, Santos, Peck, & Cortes, 2004), the literature in agricultural education is limited and focuses mainly on student recruitment into agriculture as a whole. With the lack of ethnically diverse teachers in agricultural education, the hurdles students of color have to overcome to enroll in postsecondary education, and the inherent challenges with the recruitment and retention of students of color into the profession (Guarino, Santibañez, Daley, 2006), the question remains, regarding what motivates students of color to pursue a career in agricultural education.
Self-determination theory (SDT) was used as the framework for this study (Deci & Ryan, 1985). Ryan and Deci (2000; 2002) defined SDT as a macro–theory of human motivation emphasizing an inherent orientation toward growth and development through the internalization of attitudes, values, and regulatory processes in social contexts. The term internalization refers to the process by which an individual acquires social mores and gradually transforms them into personal values (Hayamizu, 1997). In other words, the theory focuses on the degree to which behaviors are regulated based on the presence or absence of inducements. The differing degree to which the individual has accepted values makes SDT different from other developmental theories. This perspective does not treat internalization as a dichotomous concept in which values are either accepted or not by the individual, but as a more complex construct in which different types of internalization can be distinguished depending on the type of inducement present (Niemiec et al., 2006).

SDT proposes that individuals regulate their behaviors based upon the perception of how engagement in the task will satisfy the basic psychological needs for autonomy, competence, and relatedness (Deci & Ryan, 2000). This perception is based on the positive or negative stimulus or incentives they receive from participation, also known as inducements. According to Deci and Ryan, the satisfaction of these basic psychological needs is necessary for effective internalization and overall well–being. Autonomy denotes the need to experience self–rule during the initiation, participation, and termination of a behavior. Competence refers to the need for achievement when interacting in a social environment. While relatedness concerns the need for belonging and caring while interacting with others.

Previous research has found the processes occurring internally as well as socially have affected individuals’ phenomenological experiences and the internalization of attitudes, values, and regulatory processes (Niemiec et al., 2006). Therefore, an individual’s decision to major in agricultural education could be influenced by how he or she was socialized. Those individuals who have internalized the perceived benefits of being an agriculture teacher will pursue a career based on internal factors, while those individuals who do not internalize the perceived benefits of being an agriculture teacher but find it is congruent with social norms will pursue the career based on external factors. To the extent that individuals perceived their experiences with agricultural education has satisfied their three psychological needs will determine the degree of internalization; notwithstanding the complexity of internalization and an individual’s ability to ascribe to both internal and external values simultaneously.

**Purpose and Objectives**

The purpose of this phenomenological study was to glean insights on the central reasons students of color select agricultural education as their academic major. The two guiding questions were: (a) What motivates students of color to teach agriculture at the secondary level as their profession; and (b) What inhibits students of color from selecting to teach agriculture at the secondary level as their profession?

**Methods and Procedures**

A qualitative phenomenological study was implemented in order to obtain information regarding the motivation for seeking a career teaching secondary agriculture. In a phenomenology, the researcher seeks to describe the meaning for several individuals’ lived experiences of a concept or phenomenon (Creswell, 2007). In this study, the participants shared a lived experience. Each was a student of color, pursuing a career in a predominantly White agricultural education profession. The procedures for phenomenology, as illustrated by Moustakas (1994), consist of identifying a phenomenon to study, bracketing out one’s experiences or biases, and collecting data from several persons who have experienced the phenomenon. Exploring lived experiences of students of color tap into personal experiences not previously studied or shared within agricultural education research. Because this research was qualitative in nature, it followed the basic assumptions of qualitative research.
(Creswell, 2007) including: (a) reality is subjective and has multiple views from multiple participants; (b) the distance between the researcher and the phenomenon is minimized; (c) researchers are value-laden and must acknowledge the biases associated with their values; (d) the language is rhetorical in nature and reflective of the human role in the research; and (e) research uses inductive logic and emergent themes.

Participant Selection

The researchers were asked by the National Association for Agricultural Education (NAAE) to attend the National MANRRS Conference and determine the motivating factors for students of color to select teaching agriculture as a profession. Funding for attendance was provided by the NAAE. A purposive sample of 10 students of color participated in this phenomenological study. Polkinghorne (1989) suggests a true phenomenological study consist of the researcher interviewing 5 to 25 individuals who have all experienced the phenomenon. The ethnicities of the participants were African American (five students) and Latino American (five students). Each participant was an undergraduate student in the United States. The majority of participants self-reported to be from rural or suburban America. Each of the participants was pursuing a degree or had considered pursuing a degree in agricultural education with a desire to teach at the secondary level.

Procedures

Participants were nominated by advisors and recruited to participate in a nine–question semi–structured, focus group interview, lasting approximately one–hour. After obtaining informed consent, the interview took place during the first day of the MANRRS national conference. The interviews were audio–recorded and transcribed verbatim. A homogeneous type of sampling was utilized. Miles and Huberman (1994) explained this sampling focuses, reduces, simplifies, and facilitates group interviewing.

A semi–structured interview protocol was prepared to assess the participants’ passion for following a degree path in agricultural education. Two researchers moderated the question and interview session and one researcher took observational notes. All of the students’ names were coded and a reflective journal was kept throughout the process in order to bring any research biases to light and help organize thoughts.

Data Analysis

Moustakas’ (1994) phenomenological method was employed in analyzing the transcripts of the participants. In this method, six systematic steps in the data analysis procedures and guidelines were set for assembling the textual and structural descriptions. The six systematic steps are: (a) describe the personal experience with the phenomenon under study; (b) develop a list of significant statements; (c) take the statements and group into larger units of information called themes; (d) written description of what the participants experienced with the phenomenon; (e) written description of how the experience happened; and (f) written composite description of the phenomenon incorporating steps 4 and 5.

Trustworthiness

The process of validating the findings followed the format set by Creswell and Miller (2000). The researchers used follow–up interviews with the participants, and diverse methods of questioning from two different researchers to triangulate the responses. Credibility of the data was established using reference material and peer debriefing. An outside source was utilized to review the transcription and coding for validation. Additionally, follow–up phone calls or electronic mails were conducted/sent for content verification. The researchers provided findings to all participants and asked for a confirmation/approval of the results as member checks. According to Denzin and Lincoln (2005), receiving confirmation/approval of the results establishes data confirmability.

Bracketing

Denzin and Lincoln (2005) posit the identification of research bias assists in establishing data confirmability and objectivity. The researchers were each secondary agriculture teachers and are now involved in teacher
education from three different universities. One of the researchers practiced secondary teaching and teacher education in the south and the remainder in the Midwest. One of the researchers is an African American. Through triangulation of the data and noting personal biases in a reflective journal, the researchers made every attempt to minimize the influence their selection to teach played in their interaction, interview, and observations.

Results and Findings

Participants identified several areas of the agricultural education profession as factors influencing their selection. Thematic areas of internal and external values resulted from the interviews as motives for selecting agricultural education as their academic major. However, inducement themes were also acknowledged as possible inhibitors to their selection.

Motives

   Internal value.

   Internal value emerged from the coding as a major thematic area and defined by the researchers as the inherent worth of an act in a decision coming to fruition. The participants selected agricultural education for an internal value driven by fun/challenge associated with the profession rather than on external accolades, recognition, or money. In this study, the researchers found two areas representing the theme of internal value: passion and knowledge.

   Participants indicated a passion for making a positive difference through teaching and philanthropic activities. Passion was beneficial in motivating others, a passion for teaching, and a passion for learning. Furthermore, the majority of the participants in the study discussed their lack of knowledge concerning the plethora of opportunities in agricultural education until someone provided them with a better understanding of the industry. Perceptions changed and a value for agricultural education was connected to their individual interests after the participants gained more knowledge. Table 1 displays a sample of the participants’ responses to factors influencing internal value on academic major selection.

<table>
<thead>
<tr>
<th>Passion</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>“I love students and I love learning myself.”</td>
<td>“The fact that it is everything. It is food, clothes, and everything we need comes from Agriculture. You can practically work anywhere and be in Ag.”</td>
</tr>
<tr>
<td>“…the only thing I had interest in was education so I said, okay, I’ll take Ag Ed.”</td>
<td>“See, a lot of people don’t understand that a degree in agricultural education can, actually, do so many different things.”</td>
</tr>
<tr>
<td>“I enjoy learning and the only way to continue learning is by teaching.”</td>
<td>“For me I will stay forever. There are so many opportunities for me in agriculture.”</td>
</tr>
<tr>
<td>“It is really important for me to teach, it’s just my passion.”</td>
<td>“I told him [husband] that this [agricultural education] would benefit us as a family.”</td>
</tr>
<tr>
<td>“…a passion to help people with what they need and so on.”</td>
<td>“They [students of color] get exposed to what agriculture science is. After the exposure, they begin thinking about a higher education.”</td>
</tr>
</tbody>
</table>
External value.

The second major thematic area emerged from the coding was external value. External value was defined as the regulation or act of advancement as influenced by social or outside motives. Participants in this study provided evidence of an external value orientation were motivated toward agricultural education by the possibility of two areas: advancement and/or strengthening connections in agricultural education and related disciplines.

Externally, the participants were influenced by the advancement options following their initial career selection in agricultural education. Individuals who were able to persuade the participants to select agricultural education provided these students with an insight regarding the degree as a stepping-stone for advancement in pay or status. Each participant, regardless of ethnicity, understood the need for diversification in agricultural education and each felt they could contribute in their own way.

Similarly, participants indicated establishing or strengthening connections to individuals who represented their lifestyle or embedded ardor for the discipline as an influencing factor. Participants noted they identified with agricultural education as a connection to some key facets such as giving back to their community, or serving as a role model, which allowed purpose for the major. In addition, the participants noted a connection with a leader in the agriculture industry benefited their academic major selection. Table 2 displays a sample of the participants’ responses to factors influencing external value on academic major selection.

Table 2
Responses to Factors Influencing External Value on Selecting an Agricultural Education Major

<table>
<thead>
<tr>
<th>Advancement</th>
<th>Connections</th>
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</thead>
<tbody>
<tr>
<td>“I see myself in the agricultural education field for a good five years and</td>
<td>“I never saw myself immersing in agriculture, but because of her [Ag teacher],</td>
</tr>
<tr>
<td>ultimately getting my masters and becoming a principal.”</td>
<td>I see that.”</td>
</tr>
<tr>
<td>“YES. My goal is to eventually receive my PhD and teach at XXX University.”</td>
<td>“Six years after I graduated from high school, I still have that connection</td>
</tr>
<tr>
<td></td>
<td>with him [Ag teacher]...he influenced me to appreciate agriculture and the</td>
</tr>
<tr>
<td></td>
<td>diversity of agriculture.”</td>
</tr>
<tr>
<td>“I don’t want to do it for the rest of my life. I want to be a professor,</td>
<td>“I could influence others or the world to a better environment, wait a minute.</td>
</tr>
<tr>
<td>maybe a dean at a college.”</td>
<td>I can still teach and teach agriculture.”</td>
</tr>
<tr>
<td>“I could actually see myself at XXX University and teaching there.”</td>
<td>“I just could feel the connection because I feel comfortable speaking Spanish</td>
</tr>
<tr>
<td></td>
<td>with my [Ag] teacher, not in English.”</td>
</tr>
<tr>
<td></td>
<td>“My high school teacher convinced me to go into agricultural education.”</td>
</tr>
</tbody>
</table>

Inducements

Three major themes emerged from the participants’ discussion regarding factors impacting their decisions to go into agricultural education. These inducements, when negative, may act as barriers. They were personal, familial, and structural. Personal inducements identify the perceptions of the individual toward the academic and/or professional environment. These perceptions influence both their internal and external values toward a career in agricultural education. In order to overcome negative personal inducements, passion, knowledge, advancement, and connection must be addressed. The following participant statements supported this idea:

- “You are not thinking in high school about how agriculture touches every aspect of life.”
- “I believe that a lot of Latinos/Hispanics still have a negative perception about agriculture.”
Most of our ancestors and to this day family members still work in the fields from sun up, to sun down with minimal pay. Agriculture is sometimes related to illiteracy, extreme working conditions, and very little reward.”

• “That is because since we were young, agriculture is something not encouraged or linked to positive motivation, so most students don’t see the need of why to promote agriculture, which is a huge part of agriculture education.”

Familial inducements identify family or cultural perceptions toward the academic and/or professional environment. Although mostly an external motive, familial pressures may lesson an individual's opportunity to gain knowledge about the discipline, which will influence the individual’s ability to realize their passion for the discipline. Some of the participants' comments on family impact were as follows:

• “If my family support was not present [for agricultural education], I would probably have taken over my father’s business in Mexico and receive my degree in accounting.”

• “Then my family, my mother, they all wanted to know, what is a city boy trying to do in agriculture? They thought I was learning about farms and all that stuff.

• “My brother steered me toward agriculture even though I did have that negative image.”

• “So joining FFA and agriculture, my family is extremely proud because my great grandparents worked in the fields and that is what got them where we are today.”

Structural inducements identify the connection to the academic and/or professional environment. This is identified through the interactions with the agriculture teacher, school, academic major, and/or industry. In order to overcome structural barriers, there must be an understanding of and ability to communicate and connect to the culture of the identified student of color. To reiterate this message, a few direct quotes were derived from the focus groups such as:

• “It is understanding the culture that you are in. It does not matter whether you are Caucasian or Mexican, African American or whatever…as long as you understand the culture, you will understand how to influence the students.”

• “We [Latino Americans] look at teachers as a role model. As a person of respect, not saying that other cultures don’t, but when my agriculture teacher says that agriculture is a good thing, check it out. What did I do? I checked it out because it is a good thing. He understood what the culture was.”

• “She convinced me to go into Ag and she pretty much convinced my parents. They were like, Ag, what is that? Agriculture education, what is that?”

• “…teenagers are in a lost direction and with the right influence, can be on the right direction.”

In addition to the familial, personal, and structural barriers, it was noteworthy the comments provided by the participants in regards to the damaging images of agriculture that continue to exist in communities with students of color. These images may be the leading cause to the three thematic barriers. When asked to explain the images of agriculture that the participants had prior to selecting agricultural education, they mentioned phrases such as farming, manual labor, lack of (ethnic or racial) diversity, harvesting crops, and slavery. Participants noted that agricultural education must address these images if the goal is to recruit more students into teaching.

Conclusions

Based on the findings of this study, the following conclusions were made regarding the central reasons why these particular students of color selected agricultural education as their academic major: (a) passion for helping others acquire knowledge and their own personal interests to learn about and promote agriculture; (b) knowledge about agricultural education and the opportunities available to him/her as an agricultural educator; (c) perception of financial stability and status as an agricultural educator; (d) perception of having support from family
and the community with the decision to teach; (e) professional support and collaborations; and (f) teacher’s race within itself did not encourage nor discourage selection of agricultural education as a major, but the ability for the teacher to relate socially and culturally with the student of color.

Although these conclusions can only be applied to the participants of this study, they do support the available literature on student motivation and the engagement of underrepresented populations into agriculture and therefore aid in establishing a credible body of knowledge that can be used to address the ethnic gap in agricultural education. Furthermore, synthesizing the findings of this study yielded a conceptual model (Figure 1) that can serve as a guide for developing recruitment interventions and establishing future research questions for students from underrepresented populations in agricultural education.

The conceptual model begins with the four factors that influence the student’s internal and external motives toward selecting a major. According to SDT, motivation for an individual to act varies based on how the individual internalizes the task (Ryan & Deci, 2002). Therefore, as the individual begins to identify with the four influential factors, one develops strong internal or external values for the academic major, which in turn will encourage the selection of that major. However, there are three major inducements that can act as barriers for selecting one major over the other. Similar to the findings from Dyer, Breja, and Ball (2003), the inducements that may act as barriers to recruiting students of color are personal, familial, and structural. A successful recruitment initiative will identify which of the three inducements are acting as barriers for individual students and address them while promoting how agricultural education fulfills the four influential factors. This notion is supported by the findings of Roberts, Hall, Briers, Gill, Shinn, Larke, & Jaure (2009) about student participation in agricultural education being positively influenced by personal aspirations (passion),

Figure 1. Conceptual model for recruiting students of color into agricultural education

<table>
<thead>
<tr>
<th>Inducements</th>
<th>Influences</th>
<th>Motives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal</td>
<td>Passion</td>
<td>Internal Value</td>
</tr>
<tr>
<td>Familial</td>
<td>Knowledge</td>
<td>External Value</td>
</tr>
<tr>
<td>Structural</td>
<td>Advancement</td>
<td></td>
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<tr>
<td></td>
<td>Connection</td>
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- Personal: All four areas
- Familial: Family & friends, Community/Culture
- Structural: Teacher/School, Industry

Passion
- Helping Others
- Exploring personal interest

Knowledge
- Relevant skills
- Understanding opportunities

Advancement
- Financial stability
- Status and recognition

Connection
- Personal support
- Professional collaborations
high expectations and meaningful engagement (knowledge), recognition (advancement), and peer opinion (connection).

**Recommendations and Implications**

The current demographics of agricultural education do not mirror the diversity in public schools (Roberts et al., 2009). In order to sustain leadership for a viable agricultural industry, agricultural educators must strive to close the ethnic gap by recruiting students of color both at the secondary and post-secondary levels (Bowen & Rumberger, 2002; Jones & Bowen, 1998; Roberts et al., 2009). One way to encourage diversity in the student population is by encouraging diversity in the teacher population (Bowen & Rumberger, 2002). However, based on the findings of this and previous studies, if students of color are to graduate from high school with teaching agriculture as a career goal, specific strategies must be in place that take into account principles of socialization. Respect for the agriculture industry is present among students of color (Mullinix et al., 2006), but the efforts to successfully recruit and retain these students have yet to be fully realized (Bowen et al., 1991; Roberts et al., 2009). All students desire to major in a profession that they can relate to and one that contains a teacher that understands their culture, regardless of that teacher’s particular culture. This desire is even more pressing for students of color whose cultures are not salient in the academic environment.

The analysis of the lived experiences of students of color who selected agricultural education as their academic major demonstrated that the two influencing factors of knowledge acquisition and the fulfillment of individual passion are a result of the desire to satisfy the need for autonomy and competence (Mageau et al., 2009). Similarly, the two influencing factors of advancement and connecting community and culture with their profession are a result of a desire to satisfy the need for competence and relatedness (Ryan & Deci, 2000). The implication of these findings suggests that there is a need for agricultural educators to make personal connections with students of color, the students’ parents, and their communities. This connection would aid in better understanding the internal and external motives that encourage academic major selection and position the educator to address barriers to selection.

It should be noted that the value placed on the external motives might not be equal to that of internal motives based on the degree to which the individual ascribes to the influences and the impact the inducements have on the individual. In alignment with motivation theory, the presence of either motive can facilitate a choice to select agricultural education as an academic major; however, the motive that the individual values most does have an impact on the decision to teach. Those individuals that place more value on external motives are more likely to elect to teach if they perceive the presence of advancement and connections in agricultural education. Similarly, those individuals that place more value on internal motives are more likely to teach if they perceive that agricultural education fulfills their personal passions and provides opportunity for personal growth. Because internal motives are more self-regulated and internalized, the volition to teach will be stronger for those individuals with internal value towards agricultural education. Simply stated, it is most important for the retention of students of color that internal value towards agricultural education is present.

To this end, it is recommended that further research involve more students of color to confirm the validity of the conceptual model for recruiting students into agricultural education. Furthermore, based on the consistency between the findings in this study and the literature, the research team offers the following recommendations for implementation and evaluation by agricultural educators:

1. Provide various opportunities for students of color gain knowledge about agriculture and connect their interests to opportunities associated with agricultural education beginning as early as middle school. Previous studies have found that many high school students are inadequately prepared to make decisions relating to their future because there were few programs available in middle schools to provide the necessary
guidance from teachers, counselors, and parents (Peterson, Long, & Billups, 1999).

2. Address the barriers that decrease a student’s internal and external values. In both value areas, the positive connection the secondary agriculture teacher or agriculture liaison had with the participants was critical to overcoming the barriers. As noted in previous literature, perceptions regarding agriculture contain barriers that students must overcome before they can identify the internal and external value of pursuing a major in agricultural education (Dobbins, King, Fravel, Keels, & Covington, 2002; Leathberry & Wellman, 1988).

3. Implement strategies that allow the parents of students of color to see the available opportunities in agriculture, such as inviting them to career exploration activities. Familial, personal, and structural barriers must be acknowledged early to provide adequate time for a student and their families to process the information before career and academic major decisions are made (Esters & Bowen, 2003).

References


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