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J. Joey Blackburn

Louisiana State University, jjblackburn@lsu.edu

Jon W. Ramsey

Oklahoma State University

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Barriers to Conducting Supervised Agricultural Experiences as Perceived by Preservice Agricultural Education Teachers

J. Joey Blackburn

Louisiana State University

Jon W. Ramsey

Oklahoma State University

The purpose of this descriptive study was to assess preservice agriculture teachers' perceptions of the importance of Supervised Agricultural Experience (SAE) and their views on barriers to conducting SAE. A census of the sophomore-level agricultural education course at Oklahoma State University was conducted to measure perceptions at the beginning and end of the course. This study was framed upon Ajzen's Theory of Planned Behavior. Results indicated that preservice teachers perceived SAE was an important component of agricultural education and important at the secondary school they attended. The greatest barrier to conducting SAE was their lack of familiarity with newer SAE categories. This was true at both the beginning and end of the course. It is recommended that preservice teachers receive instruction on and experiences in all types of SAE. This would increase the likelihood of preservice teachers perceiving they have control over this barrier regarding SAE implementation. This cohort of preservice teachers should be surveyed over time to determine change in their perceptions of barriers to SAE implementation as they progress in the agricultural education program and through their careers. Further, the views of in-service teachers should also be assessed to determine if perceived barriers differ with professional experience.

Keywords: agricultural education, teacher education, SAE, perceptions, preservice teachers

Introduction/Background

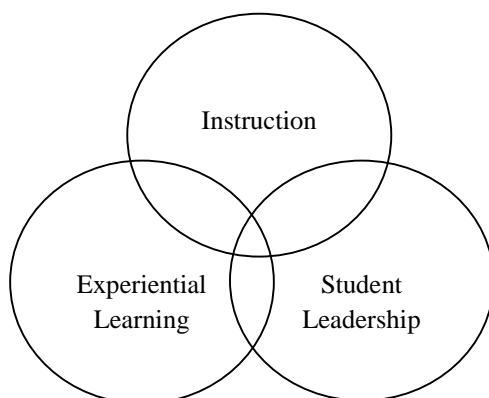
Required supervised practice in agriculture has been an integral component of school-based agricultural education since the adoption of the Smith-Hughes Act in 1917 (Phipps, Osborne, Dyer, & Ball, 2008). In fact, for vocational agriculture programs to receive federal funding, students had to engage in at least six months of supervised farming practice per year (Stimson, 1919). However, passage of the Vocational Education Act of 1963 softened the requirement that all agricultural education programs provide supervised practice in agriculture (Phipps et al.,

Direct correspondence to J. Joey Blackburn at jjblackburn@lsu.edu

2008). While the new language was meant to allow for non-farm supervised experience; some educators interpreted the law to mean supervised experience in agriculture was no longer required (Boone, Doerfert, & Elliot, 1987). The Vocational Education Act of 1963 “began a long and continuing struggle to retain one of the cornerstones of agricultural education programs in the public schools” (Phipps et al., 2008 p. 29).

Supervised Agricultural Experience (SAE) is the modern conceptualization for supervised practice in agriculture, at least, philosophically. Often, SAE is described as the hands-on, experiential component of the total agricultural education program. The model for school-based agricultural education is often illustrated with a Venn diagram composed of three equally sized, partially overlapping circles (see Figure 1). The three circles represent each of the program areas: instruction; experiential learning or SAE; and student leadership, or FFA. The illustration depicts the philosophy that each component of the agricultural education is interconnected and emphasized equally to achieve a balanced program (National FFA Organization, n.d.).

Figure 1. Total Agricultural Education Program Model



Moore (2006) argued that in many states, the circle representing SAE should be depicted as smaller than the other two to show that less emphasis is placed on SAE than FFA or classroom instruction. To illustrate this, Moore (2006) pointed out that 26 states do not have a state-approved SAE record book. Further, some agriculture teachers even believe SAEs are not appropriate for their current situation (Camp, Clarke, & Fallon, 2000). However, most research on SAE has indicated teachers perceived SAE to be an important component of school-based agricultural education (Dyer & Williams, 1997a; White, 2008; Wilson & Moore, 2007). Despite the reported decline of SAE, the literature has indicated that SAE holds numerous benefits. Knobloch (1999) stated SAE in agricultural education has “proved to help students apply knowledge, clarify career choices, solve problems through decision making, develop responsibility, and learn agricultural skills through practical experiences” (p. 16).

SAEs help foster transfer of learning through filling the void between theory and application, helping to promote a positive attitude toward learning (Phipps et al., 2008). Further, positive relationships have been reported between SAE and student achievement (Arrington & Cheek, 1990; Cheek, Arrington, Carter, & Randell, 1994; Noxel & Cheek, 1988). SAEs have also been shown to influence the local economy positively (Graham & Birkenholz, 1999; Hanagriff, Murphy, Roberts, Briers, & Lindner, 2010; Retallick & Martin, 2005; West & Iverson, 1999). Additionally, SAEs have been described as crucial in developing desirable work habits, skills, and attitudes (Berkey & Sutphin, 1984; Ramsey & Edwards, 2012; Stewart & Birkenholz, 1991). SAE projects have also been shown to increase enrollment in agricultural education programs (Retallick & Martin, 2008; Talbert & Balschweid, 2004; Thompson & Schumacher, 1998; White & Pals, 2004). SAE projects also provide motivation for students in the learning process (Kotlik, 1987). One Iowa agriculture teacher hinted at the authentic nature of SAE with the statement “proficiency awards in FFA are great portfolios where you can document skill development and ability to perform” (Retallick, 2010, p. 63).

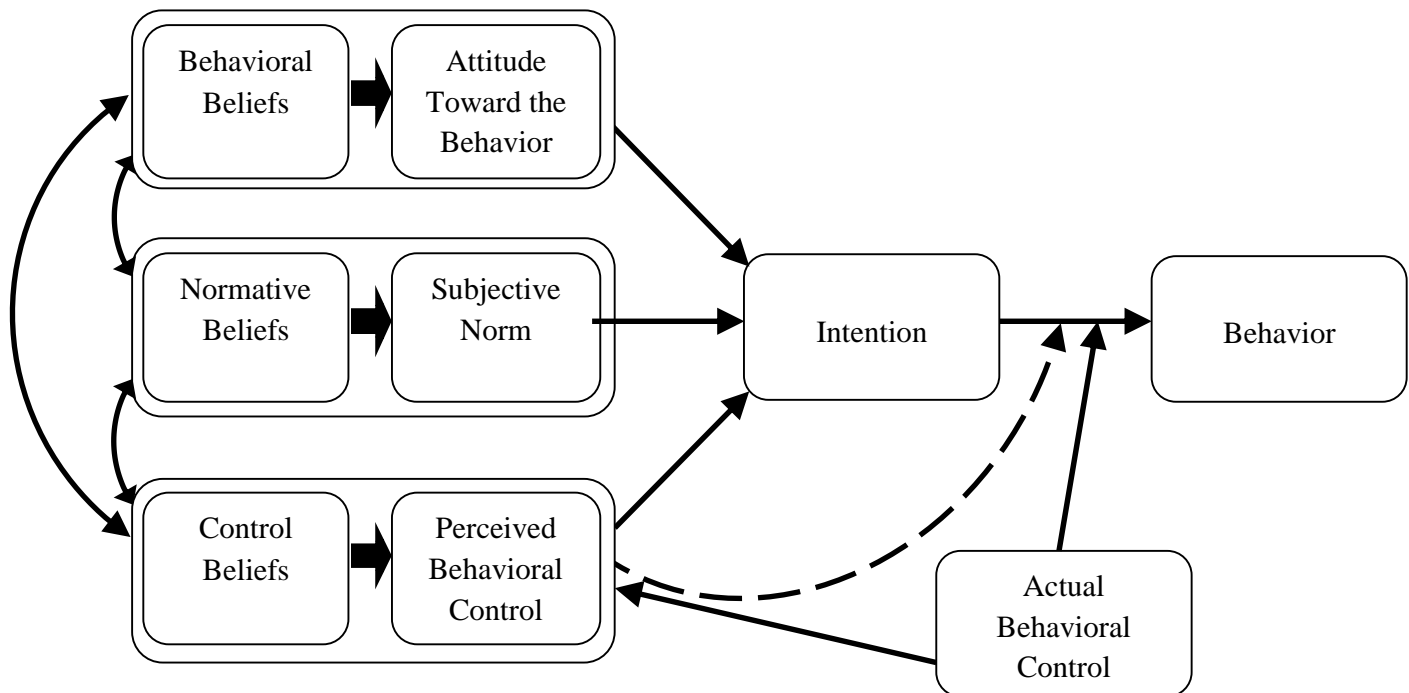
Despite agreement that SAEs are important and have positive attributes, agriculture teachers are doing a poor job of implementing SAE (Dyer & Osborne, 1995; Wilson & Moore, 2007). Barriers to successful SAE implementation have been reported in the literature. These barriers have included time, number of students, lack of a summer contract, poor administrative support, low community support, complexity of record keeping, limited resources, and lack of knowledge in newer types of SAE (White, 2008; Wilson & Moore, 2007). Additionally, Dyer and Williams (1997b) reported lack of release time, large classes, and limited travel funds as barriers to SAE project supervision. Whaley and Lucero (1993) interviewed agriculture teachers in an urban school and discovered the most significant barriers to conducting SAE were a shortage of program completers, lack of support from home, crime and vandalism of school property, overcrowding, and community safety. In contrast, agriculture teachers in a rural school identified the image of production agriculture, transportation, and a lack of appropriate facilities and equipment as perceived barriers (Whaley & Lucero, 1993). Retallick (2010) found that Iowa agriculture teachers perceived five categories of barriers to SAE implementation, including “changing demographics and societal attitudes, mechanics and structure of schools, resource availability, the agricultural education system, and image” (Retallick, 2010, p. 64). Due to the importance of SAE in the learning process, it is important to identify barriers to implementing SAE early in a teacher’s career to ensure the greatest chance of successful implementation.

Theoretical Framework

The theoretical framework employed in this study was Ajzen’s (1991) Theory of Planned Behavior (TPB). The central idea of the TPB is “intention to perform a given behavior” (Ajzen, 1991, p. 181). According to TPB, the concept of *belief salience*, or the relationship between an individual’s behavioral beliefs and attitudes toward the behavior, has major influence on whether

the behavior will be performed (Ajzen, 1991). Motivational factors influencing a certain behavior are captured within intention and indicate the degree of effort an individual will exert to perform the behavior (Ajzen, 1991). Therefore, “the stronger the intention to engage in a behavior, the more likely should be its performance” (Ajzen, 1991, p. 181). Intention to perform a certain behavior is influenced by the individual’s attitude toward the behavior, subjective norm, and the individual’s perceived behavioral control (Ajzen, 1991). Figure 2 depicts the relationship of these factors.

Figure 2. The Theory of Planned Behavior



(Adapted from Ajzen (1991, p.182). Copyright 2006 by Icek Ajzen.)

As the model portrays, attitude toward the behavior, subjective norm, and perceived behavioral control influences the individual’s formation of intention to perform a given behavior (Ajzen, 1991, 2002). Attitude toward a behavior is influenced by an individual’s behavioral beliefs, indicating how favorable or unfavorable the behavior is perceived (Ajzen, 1991). Normative beliefs then affect the subjective norm, or “perceived social pressure to perform or not perform the behavior” (Ajzen, 1991, p. 188). Finally, control beliefs influence the individual’s perceived behavioral control, which is described as how easy or difficult the individual perceives the performance of the behavior (Ajzen, 1991). Control beliefs are often operationalized as perceived barriers to behavioral implementation. Finally, actual behavioral control describes the skills, abilities, and other prerequisites the individual possess that are needed to perform the behavior (Ajzen, 1991, 2002).

Previous research has indicated that agriculture teachers value SAE as an important component of agricultural education, indicating that teachers have a positive attitude toward the behavior of implementing quality SAE (White, 2008; Wilson & Moore, 2007). Efforts at the state and national levels to promote the implementation of SAE indicate a favorable subjective norm (Wilson & Moore, 2007). Wilson and Moore (2007) concluded, “teachers need help improving the quality of the SAE component of their program” (p. 89). The preparation of future agriculture teachers at the post-secondary level may be an effective approach for instilling the idea and philosophy of SAE. This is congruent with Ajzen’s (1991) TPB (i.e., preservice teachers are exposed to SAE to develop a positive attitude toward the behavior and a favorable subjective norm). Yet other studies have indicated in-service teachers are facing challenges (Dyer & Williams, 1997b; Retallick, 2010; Whaley & Lucero, 1993; White, 2008; Wilson & Moore, 2007).

Previous studies of the barriers of SAE implementation have focused on in-service teachers (Dyer & Williams, 1997b; Retallick, 2010; Whaley & Lucero, 1993; White, 2008; Wilson & Moore, 2007). Studying the perceptions of in-service agriculture teachers regarding SAE implementation is an excellent strategy since it is entirely possible that some of the challenges faced by in-service teachers may be unknown to or little understood by preservice teachers. However, it is plausible that preservice agriculture teachers perceive a lack of behavioral control in terms of SAE implementation. Identifying these perceptions early in students’ preservice teacher education would allow teacher educators to implement interventions to counter their negative perceptions of implementing SAE. As such, the principle questions that arose from the review of literature were, do preservice teachers believe SAE is important to agricultural education and what do preservice agriculture teachers identify as barriers to implementing SAE?

Doerfert (2011) stated that effective school-based agriculture programs “will meet the academic, career, and developmental needs of diverse learners in all settings and at all levels” (p. 24). This includes the SAE component of the agricultural education program. SAE is a link between classroom knowledge and practical application of knowledge (Phipps et al., 2008); therefore, it is vital to identify preservice agriculture teachers’ perceptions of SAE implementation barriers.

Purpose of the Study

The purpose of this study was to determine if preservice agriculture teachers enrolled in a sophomore-level agricultural education course ($N = 17$) at Oklahoma State University (OSU) believe SAE is important and identify factors that may impact their ability to implement SAE. The study sought to answer four research questions:

1. What were the personal characteristics of sophomore agricultural education students at OSU?

2. What level of importance do preservice agricultural educators place upon SAE?
3. What factors did preservice agriculture teachers perceive to impact their ability to implement SAE into a secondary agricultural education program?
4. How do perceptions of SAE implementation barriers change from the beginning to end of an introductory agricultural education course?

Methods

Descriptive survey was the design employed by this research study. This study focused on a census of the students enrolled in a sophomore-level agricultural education course at OSU. The purpose of this introductory 12-week sophomore-level course is to “examine the role and purpose of agricultural education programs at the secondary level” (OSU online course description). Data were collected at two points in time, the first day and the last day of the course. Seventeen usable instruments were collected on the first day of the course, resulting in a 100% response rate. Data were collected again at the end of the course to determine changes in students’ perceptions’ regarding the implementation of SAE. It should be noted that one student had dropped the course resulting in a population of $N = 16$ at the end. Sixteen usable instruments were collected during the second data collection, resulting in a 100% response rate. Due to the small size of this census study, no attempt to generalize the findings beyond the participants has been made.

A modified version of the instrument employed by Wilson and Moore (2007) to identify SAE implementation barriers of in-service North Carolina agriculture teachers was employed for this study. The items of the instrument were reworded to more closely reflect the needs of target population of preservice teachers. The instrument contained a section to determine personal and professional characteristics, as well as 20 items designed to assess perceived importance and barriers to conducting an SAE program. The two items pertaining to the importance of SAE were arranged on a 10-point Likert-type scale with 1 representing *Not Important* and 10 indicating *Important*. The remaining items relating to SAE barriers were arranged on a five point Likert-type scale with 5 indicating *Strongly Agree*, 3 indicating *Neutral*, and 1 indicating *Strongly Disagree*. The instrument was evaluated for face and content validity by a panel of experts consisting of three agricultural education faculty members of OSU and two doctoral students who were former agriculture teachers, as well as one state agricultural education staff member. Minor changes for readability were made to the instrument per the panel’s recommendations. Post-hoc reliability analysis revealed that $\alpha = .84$. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) Version 18 for Windows. Nominal data, associated with personal characteristics of the preservice teachers, were analyzed using frequencies and percentages. Information associated with the barriers of SAE was collected via a Likert-type scale, as such, the data were ordinal in nature because the “intervals between the values cannot be presumed equal” (Jamieson, 2004, p. 1217). As such, the measure of central

tendency used to represent the typical or average score for this study was the mode. The minimum and maximum scores were tabulated, and the mode summarized students' perception of the importance of SAE and barriers to its implementation.

Findings

Research Question 1: Personal Characteristics

As shown in Table 1, more than 70% ($n = 12$) of the students enrolled in the sophomore-level agricultural education course graduated from high school in 2009. The remaining students graduated high school from 2006 to 2010.

Table 1. Personal Characteristics of Sophomore Agricultural Education Students at Oklahoma State University ($N = 17$)

Variable	<i>f</i>	%
<i>Years Enrolled in Secondary Agricultural Education</i>		
None	1	5.9
1 year	0	0
2 years	0	0
3 years	1	5.9
4 or more years	15	88.2
<i>Level of Proficiency Award Participation While in High School</i>		
None	1	5.9
Local Level	6	35.3
State Level	9	52.9
National Level	1	5.9
<i>Classification of High School Attended</i>		
Urban	2	11.8
Suburban	2	11.8
Rural	11	64.7
<i>Types of SAE While Enrolled in Secondary Agricultural Education</i>		
Entrepreneurship	11	64.7
Placement	3	17.6
Research	0	0
Other	0	0
Did not have and SAE in High School	2	11.8
<i>Gender</i>		
Male	10	58.8
Female	7	41.2

Over 70% of the participants were born in 1990 or 1991. Ten (58.8%) of the respondents were male and seven (41.2%) were female. The vast majority ($n = 15$; 88.2%) were involved in four

or more years of high school agricultural education, one student indicated two years of involvement in high school agricultural education, and the remaining student indicated no participation in high school agricultural education. Eleven (64.7%) of the students classified the high school they attended as rural. Sixteen (94.1%) had been involved in the FFA Proficiency Award Program with the majority ($n = 10$) participating at the state or national level.

Two (11.8%) students indicated they did not have an SAE project when they were in high school. Of those who reported having an SAE in high school, 11 (64.7%) reported having an SAE project classified as entrepreneurship. The remaining three (17.6%) students reported having a placement SAE.

Research Question 2: Perceived Importance of SAE

The second research question sought to determine if preservice teachers perceived SAE to be important at the beginning and end of the course. The preservice teachers perceived SAE to be important for all agricultural education students, with 10 representing the mode of this item. In addition, the participants were asked to rate how important they perceived SAE was in their high school agricultural education program. The participants perceived the SAE component of their high school agricultural education program to be important with 10 being the mode of the data. Table 2 presents students' perceived importance of SAE at the beginning of the course.

Table 2. Students' Perceptions of the Importance of SAE at the Beginning of the Course

Item	Minimum	Maximum	Mode
Importance of SAE to all agricultural education students	5	10	10
How important was SAE in your high school Ag program	5	10	10

Note: 1 = Not Important; 10 = Important

Table 3 displays students' perceived importance of SAE at the end of the course. The preservice teachers continued to perceive SAE to be important at the end of the course, with 10 remaining the mode of the data. Perceived importance of the SAE component of their high school agricultural education department at the end of the course had a mode of 10 as well.

Table 3. Students' Perceptions of the Importance of SAE at the Completion of the Course

Item	Minimum	Maximum	Mode
Importance of SAE to all agricultural education students	8	10	10
How important was SAE in your high school Ag program	7	10	10

Note: 1 = Not Important; 10 = Important

Research Question 3: Perceived Factors Affecting SAE Implementation

Table 4 presents the factors perceived as barriers by preservice teachers at OSU at the beginning of the course.

Table 4. Preservice Students' Perceptions of Factors Affecting the Implementation of Supervised Agricultural Experience Program at Beginning of the Course (N = 17)

Item	Minimum	Maximum	Mode
There are new SAE categories, such as research, that I am not familiar with conducting.	2	5	4
SAEs are not required by the state.	1	5	3
I will get more recognition for my chapter by participating in FFA activities than supervising SAE projects.	1	5	3
It will be more difficult to get support in the community for SAEs than it will be for FFA.	1	5	3
I lack the knowledge to offer individualized instruction for my students in all content areas in which SAEs may exist.	1	5	2
SAE projects are seen by students as homework.	1	4	2
Increased opportunities in FFA leave me with less time for SAE instruction.	1	5	2
Opportunities for students to have SAE projects are limited in the school and community.	1	5	2
I may not encourage students to conduct an SAE because of the lack of resources at home such as a garden area, pasture, barn, and/or equipment.	1	4	2
SAE recordkeeping is too complicated.	1	4	2
I may not encourage students to conduct SAEs because of a lack of recognition by administrators.	1	3	1
I may not encourage students to conduct SAEs because I will lack the time to visit their SAE projects.	1	4	1
I will not have time to help each student develop individualized SAE objectives and project plans.	1	3	1
Nobody really cares if I conduct SAEs or not.	1	5	1
SAEs will not be in my teaching contract.	1	3	1
The concept of SAE is outdated.	1	4	1
I may not encourage students to conduct SAEs because I may lack resources such as release time or school facilities.	3	5	1
I do not know how to teach recordkeeping.	1	5	1
Parents believe SAEs are an unrealistic expectation of their child.	1	5	1
I do not know how to supervise SAE projects.	1	5	1

Note: 1 = Disagree; 3 = Neutral; 5 = Agree.

The most significant barrier perceived by the participants was “There are new SAE categories, such as research that I am not familiar with conducting;” the mode response to this item was a four. This was the only item with a mode score within the limits of *Agree*. Three items were in the limits of *Neutral*, receiving mode scores of three: “SAEs are not required by the state;” “I will get more recognition for my chapter by participating in FFA activities than supervising SAE

projects;” and “It will be more difficult to get support in the community for SAEs than it will be for FFA.” Remaining items were in the limits of *Disagree*, receiving mode scores of one or two.

Table 5 presents perceptions of barriers to SAE implementation at the end of the course.

Table 5. Preservice Students' Perceptions of Factors Affecting the Implementation of Supervised Agricultural Experience Program at End of the Course (N = 16)

Item	Minimum	Maximum	Mode
There are new SAE categories, such as research, that I am not familiar with conducting.	1	5	5
I will get more recognition for my chapter by participating in FFA activities than supervising SAE projects.	2	5	3
SAE projects are seen by students as homework.	1	4	3
Opportunities for students to have SAE projects are limited in the school and community.	1	5	2
I may not encourage students to conduct SAEs because of a lack of recognition by administrators.	1	2	1
I may not encourage students to conduct SAEs because I will lack the time to visit their SAE projects.	1	2	1
I will not have time to help each student develop individualized SAE objectives and project plans.	1	3	1
Nobody really cares if I conduct SAEs or not.	1	2	1
SAEs will not be in my teaching contract.			
The concept of SAE is outdated.	1	2	1
I may not encourage students to conduct SAEs because I may lack resources such as release time or school facilities.	1	4	1
I do not know how to teach recordkeeping.	1	3	1
Parents believe SAEs are an unrealistic expectation of their child.	1	4	1
I do not know how to supervise SAE projects.	1	5	1
SAE recordkeeping is too complicated.	1	3	1
I may not encourage students to conduct an SAE because of the lack of resources at home such as a garden area, pasture, barn, and/ or equipment.	1	2	1
SAEs are not required by the state.	1	5	1
Increased opportunities in FFA leave me with less time for SAE instruction.	1	3	1
I lack the knowledge to offer individualized instruction for my students in all content areas in which SAEs may exist.	1	5	1
It will be more difficult to get support in the community for SAEs than it will be for FFA.	1	5	1

Note: 1 = *Disagree*; 3 = *Neutral*; 5 = *Agree*.

The most significant barrier perceived by the participants on completion of the course was “There are new SAE categories, such as research that I am not familiar with conducting.” This item had a mode score of five. This item was the only item that received a mode score within the limits of *Agree*. Two items were in the limits of *Neutral*, receiving a mode score of three.

These items were “I will get more recognition for my chapter by participating in FFA activities than supervising SAE projects” and “SAE projects are seen by students as homework.” The remaining items were in the limits of *Disagree* receiving mode scores of one or two.

Conclusions/Implications

The typical student in this sophomore-level agricultural education course is a 21-year-old male who attended high school in a rural school district. He had an entrepreneurship SAE in high school and reported participating at some level of the FFA Proficiency award program.

These preservice teachers perceive the SAE component of agricultural education to be important for all students. Even though this is the first post-secondary agricultural education course these preservice teachers had taken at OSU they recognized the importance of SAE. This finding was likely due to their own participation in the SAE component of agricultural education when they were in high school. Students also indicated SAE was an important component of their high school agricultural education experience. Perhaps these perceptions of importance stemmed from their positive experiences with SAE at the secondary level.

On completion of the course, students remained firm in the perception that SAE were important for all students. Although scores at the beginning and end of the course remained important, it appeared the students' course experience not only reinforced the perception of SAE importance but may have played a role in increasing that view, as shown in the increased minimum importance score. Likewise, these preservice teachers perceived their own secondary SAE experience to be slightly more important at the end of the course than at the beginning. Perhaps reflecting on their own experiences with SAE during the semester facilitated students in reaffirming and strengthening their views on SAE.

Per Ajzen's (1991) Theory of Planned Behavior (TPB), these preservice teachers had a positive attitude toward behaviors associated with conducting SAE as indicated by their perception of SAE importance. This positive attitude towards the importance of SAE is congruent with the findings of previous researchers (White, 2008; Wilson & Moore, 2007). According to Ajzen (1991), a positive attitude toward a behavior is a requirement for conducting the behavior. Wilson and Moore (2007) found a favorable subjective norm toward SAE on the part of agriculture teachers in North Carolina, so the final component of TPB affecting the implementation of SAE by these preservice teachers is perceived behavioral control (Ajzen, 1991) or perceived barriers.

Other researchers (White, 2008; Wilson & Moore, 2007) indicated several barriers to conducting SAE that were perceived by in-service agricultural education instructors. Results from this study indicate preservice teachers only perceive a lack of knowledge on newer types of SAE, such as

Research and Exploratory, to be a barrier to implementing SAE. This specific barrier also concurs with the findings of Wilson and Moore (2007). Is this single barrier enough to prevent these preservice teachers from implementing SAE once they graduate, and secure employment as an agriculture teacher? Or, would this barrier only impact these students implementation of the newer types of SAE? As a cohort, this group of preservice teachers was unsure about four possible barriers, as they were ranked *Neutral*. Perhaps these students simply do not know what they do not know regarding the implementation of SAE, which would not be unexpected for preservice professionals.

When examining the maximum values for each of the barrier items at the beginning of the course, it becomes clear that at least some of the students perceived many of the items as barriers to SAE implementation. In fact, all but two items were thought of as barriers by at least one student. This variance between students is not entirely unexpected. As preservice agriculture teachers in an early phase of their professional education, these students have likely not had first-hand experiences with issues surrounding SAE implementation, other than their own high school experiences. Could it be that these preservice teachers have overestimated their actual behavioral control to the point where they no longer perceive a lack of behavioral control (Ajzen, 1991)?

Recommendations

Recommendations for Future Research

Further research is warranted to investigate the impact a post-secondary agricultural education program has on preservice teachers' perceptions of the importance of SAE, as well as perceived barriers to conducting SAE. This cohort of students should be surveyed throughout their tenure in the preservice agricultural education program vis-a-vis the potential impact of significant programmatic learning experience. In addition, practicing teachers in Oklahoma should be surveyed to gauge their perceptions of importance and barriers to conducting SAE. Although researchers (Retallick, 2010; White, 2008; Wilson & Moore, 2007) have recently described the SAE perceptions of agriculture teachers in Kentucky, North Carolina, and Iowa, no such studies have been conducted in Oklahoma. These findings could be compared to that of preservice teachers to understand better the phenomena through the prism of the TBP.

Recommendations for Future Practice

Regarding recommendations for practice, students in this course should be afforded the opportunity to experience a variety of SAE categories available to secondary agriculture students. This could ease the anxiety these students may have about the newer types of SAE categories. Perhaps current agriculture teachers who promote these types of SAEs could be used

as guest lecturers to give preservice teachers a positive vicarious experience (Bandura, 1994). Promotion of all types of SAE categories should continue throughout the students' preservice program. In particular, special attention should be placed on early field experiences (EFE) that preservice teachers are required to complete. Targeting SAE categories in the SAE component of the EFE may reduce any dissonance preservice teachers have concerning implementation of the SAE component.

Per the Theory of Planned Behavior (Ajzen, 1991), neutralizing perceived barriers should give future agriculture teachers increased perceived control over conducting SAE programs. This combined with perceived importance and positive normative beliefs should increase the likelihood of these future agriculture teachers implementing the SAE component of the secondary agricultural education program, including categories of which they may have had little knowledge before their university experience.

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J. Joey Blackburn is an Assistant Professor of Agricultural Education at Louisiana State University.

Jon W. Ramsey is an Assistant Professor of Agricultural Education at Oklahoma State University