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Supervised Agricultural Experience Instruction in Agricultural Teacher Education Programs: A National Descriptive Study

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Abstract

Faculty in agricultural teacher education programs are responsible for preparing future teachers to lead effective school-based agricultural education programs. However, agriculture teachers are having difficulty implementing supervised agricultural experience (SAE), even though they value it conceptually as a program component. In an effort to improve SAE instruction in teacher education, the American Association for Agricultural Education has adopted a guiding philosophy and competencies for teacher preparation in SAE. Using these documents, the purpose of this national descriptive study was to identify where and to what extent SAE instruction was included within agricultural teacher education curriculum and describe the level of SAE instruction occurring in agricultural teacher education programs in the United States. Findings of this study indicate that there was a broad range in the level of instruction occurring for each of these competencies among teacher education programs. These results provide a snapshot of one-moment-in-time and serve as a starting point for a conversation about how supervised agricultural experience should be taught in agricultural teacher education. It is recommended that supervised agricultural experience competencies be taught using inquiry-based or problem-solving methods guided by the experiential learning process.

Keywords: Supervised agricultural experience; SAE; teacher education; experiential learning

Introduction

Faculty in university agricultural teacher education programs bear the responsibility of preparing future teachers to lead school-based agricultural education (SBAE) programs (Roberts & Dyer, 2004). Roberts and Dyer (2004) further stated, "Creating effective agriculture teachers is imperative for the long-term sustainability of agricultural education programs" (p. 94). Similarly, Myers and Dyer (2004) proposed "the goal of teacher education is to make the most effective use of the time available to prepare future educators for the task awaiting them" (p. 47). To meet these goals, preservice agriculture teachers are prepared using a combination of coursework, early field experience (EFE), and student-teaching. However, the coursework comprising the curricular structure of individual programs varies widely across agricultural teacher education programs (McLean & Camp, 2000).

As part of agricultural teacher education, "SBAE preservice programs should work to promote authentic experiences for preservice teachers to develop, implement, maintain, sustain, evaluate, supervise, and communicate an SAE program" (Rubenstein et al., 2014, p. 81). In a study of 10 selected agricultural teacher education programs, all of the programs included SAE or an

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equivalent topic at various points within their curriculum; however, only three (30%) of the selected institutions reported a separate SAE course (McLean & Camp, 2000).

Conceptual Framework

The components of an effective SBAE program are commonly depicted in a Venn diagram as three intersecting circles consisting of contextual, inquiry-based learning through classroom and laboratory interaction, leadership engagement through the National FFA Organization, and planned and supervised, experience-based learning through SAE (Talbert, Vaughn, Croom, & Lee, 2014), which is the focus of this study. Over time, SAE has evolved from vocational training in a production agriculture context to include a broader variety of SAE types. Currently, the National Council for Agricultural Education ([NCAE], 2015) defines the types of SAE as exploratory, placement/internship, ownership/entrepreneurship, research, school-based enterprise, and service learning.

Although SAE is often thought of as the primary experiential learning component of the SBAE model (Baker, Robinson, & Kolb, 2012; Barrick & Hughes, 1993; Bird, Martin, & Simonsen, 2013), experiential learning occurs within the context of formal classroom instruction or FFA activities as well (NCAE, 2015). The SAE component differs from other forms of experiential learning practiced in SBAE such as inquiry-based classroom or lab instruction, field trips, or FFA competitive events because it includes career planning, is managed by the student, occurs outside of classroom instruction, and occurs in a real-world or a simulated workplace environment (NCAE, 2015).

The NCAE (2015) has determined "each portion of the title 'Supervised Agricultural Experience' is significant in describing what is expected of all teachers and students of agricultural education" (p. 1). Agriculture teachers should provide onsite supervision when possible, but also provide supervision through other methods such as computer technology, written reports, and group meetings to assist students in planning and conducting their SAE (NCAE, 2015). Contextually, the SAE is based on agriculture and should form a linkage between agriculture, food, and natural resources (AFNR) instruction, the students' interests, and career exploration (NCAE, 2015).

Agriculture teachers have an influence on the implementation and success of SAE programs (Dyer & Osborne, 1995; Philipps, Osborn, Dyer, & Ball, 2008; Retallick, 2010; Rubenstein, Thoron, & Estepp, 2014; Swortzel, 1996). However, "there is a paradox between the value teachers place on SAE and the manner in which SAE is being implemented" (Wilson & Moore, 2007, p. 89). Agriculture teachers have difficulty implementing SAE in practice even though they value it conceptually (Dyer & Osborne, 1995; Retallick, 2010; Wilson & Moore, 2007). Wilson and Moore (2007) suggested that agriculture teachers are not implementing SAE because of a lack of rewards in the second phase and perceived barriers in the third phase of Locke's (1991) motivational schema. In the motivation hub, actions toward a goal are influenced by the value placed on the goal and by the perceived ability to take the actions necessary to achieve the goal (Locke, 1991). Perceived barriers limit the implementation of SAE even though agriculture teachers consider SAE programs to be valuable (Retallick, 2010; Wilson & Moore, 2007).

SAE instruction in agriculture teacher education programs plays a role in how teachers conceptualize and implement SAE. A guiding philosophy, as well as competencies for teacher preparation in SAE, have been developed by the American Association for Agricultural Education ([AAAE], 2013a; 2013b). The need exists for a national study to identify how and to what extent these SAE competencies are incorporated within agricultural teacher education programs in the United States.

Purpose and Objectives

The purpose of this study was to identify the extent SAE instruction was included within agricultural teacher education curricula and describe the level of instruction occurring in agricultural teacher education programs in the United States for each of the *Competencies for Agriculture Teacher Preparation in SAE* (AAAE, 2013b). Specific objectives of this study were to (a) describe the agricultural teacher education programs that are teaching SAE objectives; (b) determine the level of instruction of each of the AAAE teacher education SAE competencies within the agricultural teacher education programs; and (c) identify the program representatives' perceptions of their programs' SAE instruction in relation to the agricultural education model.

Methods

The population for this study was all agricultural teacher education programs in the United States. One faculty member from each agricultural teacher education program was contacted as the representative of their institution's program. The population and program representatives were identified using the *AAAE Directory of University Faculty in Agricultural Education* (Dyer, 2003), AAAE Agricultural Education Directory online, NAAE Teach Ag website, and university or departmental websites. The program representatives were agricultural teacher education coordinators, department heads, or faculty members designated as program contacts. Designated departmental contacts were screened using university/departmental website information to ensure that they were faculty members rather than staff. If no agricultural teacher education coordinator or designated departmental contact was identified by an institution on the institution's website, the department chair was asked to represent the department. In instances where more than one faculty member was listed as a contact, faculty biography pages were analyzed, and a representative was selected based on their research and teaching relating to SAE and SBAE. If no agricultural teacher education program was listed by an institution that appears in one or more of the directories, a phone call was made to the institution to verify the existence of an agricultural teacher education program and identify a representative. This search resulted in the identification of 95 agricultural teacher education programs.

A survey instrument was developed using Qualtics following the Tailored Design Method for Internet Surveys (Dillman, Smyth, & Christian, 2014). The instrument consisted of three sections based on the three objectives of the study. Content validity was evaluated by a review panel consisting of university faculty (n = 5) from across the United States, who have published SAE research. A separate panel of university faculty with experience in survey methodology (n = 4) reviewed the survey and evaluated face validity including the overall clarity and ease of navigation of the instrument. Feedback from both panels was considered, and adjustments to the survey instrument were made based on their recommendations. After the survey instrument was revised and IRB approval was received, an invitation was sent via email to the agricultural teacher education program representatives to explain the purpose of the study and emphasize the importance of their response. This invitation included a link to access the survey. Following the invitation, three reminder emails were sent to non-responders. These reminder emails were spaced several days apart over approximately two weeks. Dates and times for the reminder emails were purposefully selected to avoid the reminders being received by respondents on weekends or Monday mornings.

Email requests for participation were sent to representatives of 95 institutions across the United States. The response rate for this survey was 78.95%. Of the 75 institutions responding, 5 indicated that they did not have any currently enrolled students or graduates within the past 5 years who had a major in agricultural teacher education. An additional two respondents indicated SAE

was not part of their instruction. Institutions that indicated they did not have current students or recent graduates or that did not teach SAE within their curriculum were directed to the end of the survey and thanked for their participation, leaving 68 usable responses for a usable response rate of 71.58%.

The first section of the survey instrument collected programmatic information regarding the type of institution as well as the department or school that housed the agricultural teacher education program. Additionally, respondents were asked to select the type/level of agricultural teacher education in which SAE instruction was offered at their institution, category of courses in which SAE objectives were included, and the SAE course content offered in stand-alone courses or embedded within the curriculum in their agricultural teacher education program.

The second section of the survey instrument consisted of statements derived from the *Competencies for Agriculture Teacher Preparation in SAE* (AAAE, 2013b). Participants were asked to rate their institution's level of instruction for each statement using an ordinal scale. Early and late responders were compared to control for nonresponse error on the ordinal scale questions. A wave of late responders could not be identified, so late responders were defined operationally as the latter 50% of responders (Lindner, Murphy, & Briers, 2001). An independent samples *t*-test showed no statistically significant ($p > 0.05$) difference between early and late responders on the ordinal scale questions.

The ordinal scale for these items in the second section was adapted from the *West Virginia State Community and Technical College General Education Core-Audit Grid* (Scroggins, 2004) and consisted of a 5-point ordinal scale. The ordinal scale items are described in Table 1.

Table 1

Description of Ordinal Scale Levels

Ordinal Scale Level	Description
Not at all	Not introduced
Introduced	Introduces students to a content area or skill they are not familiar with
Emphasized	Content area or skill has been introduced and students have a basic knowledge, instruction is focused on enhancing content and building a more complex understanding
Reinforced	Instruction builds upon a competency that has been previously introduced/emphasized and reinforces the content or skill
Applied	Applies the content or skill in a problem-solving or real-world setting

Note. Ordinal scale adapted from the West Virginia State Community and Technical College General Education Core-Audit Grid.

In the third section, respondents were asked to indicate the area of the agricultural education model as currently depicted by the National FFA Organization that most closely approximated the focus of their institution's agricultural teacher education program. A heat map was used to show the areas of the agricultural education model that were selected by the

respondents. The heat map used a color scale to visually represent the area of the model selected by each respondent. The corresponding colors ranged from gray indicating no selection to bright red indicating that multiple respondents selected an area.

Responses to the survey instrument were analyzed using the IBM SPSS 23 statistical package. Mode, median, and frequencies are appropriate for reporting stand-alone ordinal responses (Boone & Boone, 2012). Findings were reported using descriptive statistics including the frequency, median, mode, mean, and standard deviation for ordinal responses and as percentages or counts for other responses. In addition, the survey instrument contained short answer questions to provide a richer description related to some responses. Confidentiality was maintained, and individual faculty or institutions were not identified in any reported data.

Findings

The responding programs represented 1862 land grant institutions (n = 34), regional/state institutions (n = 28), 1890 land grant institutions (n = 3), and private institutions (n = 3). Agricultural teacher education programs were housed in a variety of departments or schools (see Table 2). The most common category was a traditional agricultural education department such as the departments of Agricultural Leadership, Education and Communications, or Agricultural and Extension Education. However, agricultural teacher education was also administered through departments or schools of agriculture; agricultural content areas such as animal science or horticulture; education; non-agricultural content areas; or interdisciplinary programs.

Table 2

Category of Department or School Responsible for Agriculture Teacher Education

	Responses (n = 68)	
Department or School	*f*	%
Agricultural Education (i.e., AGEDS; ALEC)	32	47.06
Agriculture or agricultural content area (i.e., animal science; horticulture)	18	26.47
Education	10	14.71
Non-agricultural content area (i.e., community development)	3	4.41
Interdisciplinary	3	4.41
CTE	1	1.47
Academic Programs	1	1.47

The respondents indicated that SAE content was most often taught by tenured/tenure-track faculty. However, non-tenure track faculty and to a lesser extent, graduate students also taught SAE content (see Table 3).

Table 3

Faculty Appointment of Those Teaching SAE Curriculum

	Responses (n = 65)	
Type of Appointment	*n*	%
Tenured/tenure track	54	83.08
Non-tenure track	24	36.92
Graduate assistant	6	9.23

Note. SAE may be taught by people with different appointment types within the same institution.

Additionally, the respondents indicated that undergraduate programs were the most common type of program that included SAE instruction (see Table 4). SAE objectives were also taught in graduate programs as well as through professional development and alternative certification programs.

Table 4

Agriculture Teacher Education Programs Offering SAE Instruction by Level(s)/Type(s) of Program

	Responses (n = 68)	
Level/Type of Program	*f*	%
Undergraduate	64	94.12%
Graduate	27	39.71%
Professional development	13	19.12%
Alternative certification	6	8.82%

Note. Institutions may offer more than one level/type of teacher education program resulting in a total $f > 68$.

The most common context in which SAE objectives are taught in both undergraduate and graduate programs is during student teaching (see Table 5). SAE or experiential learning courses that address objectives specifically related to SAE are offered in 53.13% of undergraduate and 44.44% of graduate programs responding to this study. The course category with the lowest number of undergraduate programs ($n = 2$) and graduate programs ($n = 1$) reporting SAE instruction was educational psychology. Text responses for undergraduate "Other" were agriscience methods, summer experience class, and teaching practicum. Text responses for graduate "Other" were agriscience methods and youth organizations.

Additionally, respondents were asked to select the SAE course content offered in stand-alone courses or embedded within the curriculum in their agricultural teacher education programs

(see Table 6). The most frequent responses were types of SAE (n = 60) and supervision (n = 60). Specific recordkeeping systems were taught in 70.59% (n = 48) of the responding programs. Text responses for "Other" included "child labor laws," "I do not teach the course so there could be other topics," and "State-level economic impact; research and literature on SAE."

Table 5

Courses in Which SAE Instruction was Offered (n = 68)

	Undergraduate (n = 64)		Graduate (n = 27)	
Course Category	*f*	%	*f*	%
Student teaching	53	82.81	19	70.37
Program planning	42	65.63	19	70.37
SAE/experiential learning	34	53.13	12	44.44
Teaching methods	34	53.13	12	44.44
Early field experience	34	53.13	9	33.33
Introduction/orientation	29	43.31	3	11.11
Foundations	23	35.94	8	29.63
Other	3	4.69	2	11.11
Educational psychology	2	3.13	1	3.70

Note. Institutions may offer SAE instruction in more than one course.

Table 6

SAE Content Taught within the Curriculum

	Responses (n = 68)	
Content	f	%
Types of SAE (i.e., entrepreneurship)	60	88.24
Supervision	60	88.24
Recordkeeping/accounting	56	82.35
Proficiency award and FFA degree applications	56	82.35
Experiential learning theory	55	80.88
Historical context of SAE	53	77.94
SAE selection, creation, and growth	50	73.53
Specific recordkeeping systems (i.e., paper-based or electronic)	48	70.59
Safety/liability	44	64.71
SAE reporting/communication	42	61.76
Diversity/options for all students	36	52.94
Stakeholder involvement	35	51.47
Summer programs	35	51.47
Specific agriculture skills	24	35.29
Specific home improvement skills	14	20.59
Other	3	4.41

Respondents who indicated their program taught a specific recordkeeping system (n = 48) were directed to an open-ended question to list the name of the recordkeeping system that was taught in their program. These text responses (n = 44) were coded for recordkeeping system and are listed by category in Table 7. The most common recordkeeping system used was the agricultural experience tracker (AET). A total of 77.28% of the programs that reported using a specific recordkeeping system used either AET alone or in conjunction with a state record book system and/or Excel.

Table 7

Text Responses for Specific Recordkeeping Systems

	Responses (n = 44)	
Specific Recordkeeping System	*f*	%
AET	29	65.91
State record book system	7	15.90
AET and state record book system	2	4.55
AET and Excel	2	4.55
AET/state/Excel	1	2.27
State and Excel	1	2.27
Practicing teachers present their designated system to class	1	2.27
Record book for the SAEP in agricultural science and technology	1	2.27

The second section was based on objective two and was designed to measure the level of instruction occurring in each of the *Competencies for Agriculture Teacher Preparation in SAE* (AAAE, 2013b). Each of the seven competencies consisted of one to three related objectives.

Competency one (see Table 8) consisted of three objectives related to all students having SAE programs based on career pathways/clusters/interests and agricultural curriculum standards. Two objectives in competency one had a mode of 2, indicating that these objectives were most often taught at the emphasized level. However, 1 of these 2 objectives was taught at an applied level in 21 programs yielding a median of 3.00 as a measure of central tendency. It should be noted in regard to objectives in competency one, the NCAE has added the categories of school-based enterprise and service learning as recognized types of SAE (NCAE, 2015) and that the recognized SAE types are currently different than the types recognized when these data were collected. The lowest rated objective in competency one was most frequently taught at the introduced level (*Mdn* = 2, *Mode* = 1).

Competency two (see Table 9) consisted of three objectives relating to SAE being planned, developed, and managed by the student with instruction and support by the agricultural teacher, parents, and/or employer. Two of the objectives in competency two had a mode of 2 indicating that these two objectives are most frequently taught at the emphasized level. The remaining objective in competency two had a mode of 1 indicating that it was most frequently taught at an introduced level. All three objectives in competency two had a median of 2.00 indicating a central tendency of the objectives being taught at an emphasized level.

Two statements relating to accurate records of SAE supervision by the agriculture teacher comprised competency three (see Table 10). Both of the competencies had a median of 2.00. However, one competency, which was focused on formulating a recordkeeping strategy to

document SAE outcomes had a mode of 4 indicating that it was most frequently taught at the applied level.

Competency four (see Table 11) consisted of three statements related to continual instruction and supervision of SAE programs provided by the agriculture teacher throughout the calendar year. One of the objectives in competency four that focused specifically on SAE supervision had a mode of 4 indicating this objective is most frequently taught at the applied level. Another objective had a mode of 2 indicating that the objective was most frequently taught at the emphasized level. The remaining objective had a mode of 1 indicating that designing a reporting procedure to school administration is most frequently taught at an introduced level.

Competency five (see Table 12) consisted of three statements related to each agriculture student maintaining up-to-date SAE records. Two objectives in competency five each had a mode of 4. However, all three objectives in this competency had a median of 2.00 indicating that although the first two objectives were most frequently rated as applied, there was a broad range of responses and the center of the response distribution for each of these three objectives was in the emphasized level of instruction.

Two statements regarding completing and submitting an annual summary of students' SAE programs to appropriate entities comprised competency six (see Table 13). One objective was most frequently taught at the emphasized level (*Mode* = 2) with a median of 2.00. The remaining objective was most frequently taught at the introduced level (*Mode* = 1) with a median of 1.00.

The final competency, competency seven (see Table 14), consisted of one objective related to students having comprehensive SAE programs that show evidence of growth in size and/or scope. This objective was most frequently rated as emphasized (*Mode* = 2). The center of the distribution for this objective was also within the emphasized response (*Mdn* = 2.00).

Table 8

Level of Instruction Pertaining to the AAAE Competencies for Teacher Education in SAE Competency 1

Competency 1	*n*	Not at All		Introduced		Emphasized		Reinforced		Applied		*Mdn*	*Mode*	*M*	*SD*
		f	%	*f*	%	*f*	%	*f*	%	*f*	%				
Define, by example, the four recognized SAE types (i.e., entrepreneurship, placement, research and experimentation, and exploratory).	64	1	1.56	7	10.94	23	35.94	12	18.75	21	32.81	3.00	2	2.70	1.094
Articulate the theories of experiential learning as they relate to school-based agricultural education.	63	1	1.59	16	25.40	19	30.16	10	15.87	17	26.98	2.00	2	2.41	1.86
Relate the process of student SAE selection, creation, and growth toward college and/or career readiness to your state's interpretation of Career Clusters and Pathways.	64	1	1.56	23	35.94	21	32.81	8	12.50	11	17.19	2.00	1	2.08	1.117

Note. Scale: 0 = Not at All, 1 = Introduced, 2 = Emphasized, 3 = Reinforced, 4 = Applied

Table 9

Level of Instruction Pertaining to the AAAE Competencies for Teacher Education in SAE Competency 2

		Not at All		Introduced		Emphasized		Reinforced		Applied					
Competency 2	*n*	*f*	%	*f*	%	*f*	%	*f*	%	*f*	%	*Mdn*	*Mode*	*M*	*SD*
Interpret the positive impacts of developing an instructional relationship.	65	2	3.08	18	27.69	20	30.76	18	27.69	7	10.77	2.00	2	2.15	1.049
Create a sequential curriculum to guide students through SAE selection, creation, and analysis.	63	5	7.94	13	20.63	28	44.44	4	6.35	13	20.63	2.00	2	2.11	1.193
Design a formal procedure for incorporating the employer relationship into the establishment and experiential progression of an exploratory or placement SAE.	65	7	10.77	23	35.38	14	21.54	16	24.62	5	7.69	2.00	1	1.83	1.153

Note. Scale: 0 = Not at All, 1 = Introduced, 2 = Emphasized, 3 = Reinforced, 4 = Applied

Table 10

Level of Instruction Pertaining to the AAAE Competencies for Teacher Education in SAE Competency 3

		Not at All		Introduced		Emphasized		Reinforced		Applied					
Competency 3	*n*	*f*	%	*f*	%	*f*	%	*f*	%	*f*	%	*Mdn*	*Mode*	*M*	*SD*
Describe the relationship of instructional SAE visitations as a means of individualized learning to support college and/or career readiness of the school-based agricultural education student.	65	3	4.62	7	10.77	23	35.38	18	27.69	14	21.54	2.00	2	2.51	1.091
Formulate a record keeping strategy to document student SAE outcomes based upon the concept of career pathway progression.	64	6	9.38	12	18.75	15	23.44	11	17.19	20	31.25	2.00	4	2.42	1.355

Note. Scale: 0 = Not at All, 1 = Introduced, 2 = Emphasized, 3 = Reinforced, 4 = Applied

Table 11

Level of Instruction Pertaining to the AAAE Competencies for Teacher Education in SAE Competency 4

		Not at All		Introduced		Emphasized		Reinforced		Applied					
Competency 4	*n*	*f*	%	*f*	%	*f*	%	*f*	%	*f*	%	*Mdn*	*Mode*	*M*	*SD*
Conduct an SAE supervisory visit and enlist the assistance of others in SAE supervision.	65	4	6.15	6	9.23	12	18.46	14	21.54	29	44.62	3.00	4	2.89	1.252
Illustrate to school administration the intra-curricular nature of SAE as an extended teaching strategy for student learning within a selected career pathway.	65	6	9.23	16	24.61	20	30.77	14	21.54	9	13.85	2.00	2	2.06	1.184
Design a reporting procedure to school administration that measures and validates student learning outcomes as a result of year-round supervision.	65	13	20.00	17	26.15	16	24.62	12	18.46	7	10.77	2.00	1	1.74	1.278

Note. Scale: 0 = Not at All, 1 = Introduced, 2 = Emphasized, 3 = Reinforced, 4 = Applied

Table 12

Level of Instruction Pertaining to the AAAE Competencies for Teacher Education in SAE Competency 5

		Not at All		Introduced		Emphasized		Reinforced		Applied					
Competency 5	*n*	*f*	%	*f*	%	*f*	%	*f*	%	*f*	%	*Mdn*	*Mode*	*M*	*SD*
Devise a plan to incorporate SAE involvement into the school-based agricultural education program grading system.	65	2	3.08	13	20.00	20	30.77	12	18.46	18	27.69	2.00	2	2.48	1.187
Design a curriculum unit in which students are introduced to the basic elements of record keeping as they relate to enterprise development and management.	65	4	6.15	17	26.15	15	23.08	7	10.77	22	33.85	2.00	4	2.40	1.356
Adapt an SAE record keeping format appropriate for an enterprise in each of the four SAE types recognized by The National Council for Agricultural Education.	65	5	7.69	19	29.23	10	15.38	8	12.31	23	35.38	2.00	4	2.38	1.422

Note. Scale: 0 = Not at All, 1 = Introduced, 2 = Emphasized, 3 = Reinforced, 4 = Applied

Table 13

Level of Instruction Pertaining to the AAAE Competencies for Teacher Education in SAE Competency 6

		Not at All		Introduced		Emphasized		Reinforced		Applied					
Competency 6	*n*	*f*	%	*f*	%	*f*	%	*f*	%	*f*	%	*Mdn*	*Mode*	*M*	*SD*
Write measurable student learning outcomes that provide evidence of progress toward selected career pathway goals and college and/or career readiness based upon various SAE records.	65	8	12.31	15	23.08	17	26.15	11	16.92	14	21.54	2.00	2	2.12	1.329
Design a strategy to compare and contrast individual student progress toward selected college and/or career readiness, and prepare a summary report of finding to appropriate entities on a four-year time period.	65	15	23.08	22	33.85	13	20.00	5	7.69	10	15.38	1.00	1	1.58	1.345

Note. Scale: 0 = Not at All, 1 = Introduced, 2 = Emphasized, 3 = Reinforced, 4 = Applied

Table 14

Level of Instruction Pertaining to the AAAE Competencies for Teacher Education in SAE Competency 7

		Not at All		Introduced		Emphasized		Reinforced		Applied					
Competency 7	*n*	*f*	%	*f*	%	*f*	%	*f*	%	*f*	%	*Mdn*	*Mode*	*M*	*SD*
Develop a plan of comprehensive student growth toward college and/or career readiness within each of the four recognized types of SAE (i.e., entrepreneurship, placement, research & experimentation, and exploratory).	65	14	21.54	16	24.62	23	35.38	5	7.69	7	10.77	2.00	2	1.62	1.221

Note. Scale: 0 = Not at All, 1 = Introduced, 2 = Emphasized, 3 = Reinforced, 4 = *Applied*

The statement "conduct an SAE supervisory visit and enlist the assistance of others in SAE supervision" (M = 2.89, SD = 1.252) in competency four was the highest rated objective statement among all of the *Competencies for Agricultural Teacher Preparation in SAE*. Additionally, the mode for this statement (*Mode* = 4) indicated that the most common response to this statement was applied. The lowest rated item was for the statement "design a strategy to compare and contrast student progress toward selected college and/or career readiness and prepare a summary report of findings to appropriate entities on a four-year time period" (*Mdn* = 1, Mode = 1, M = 1.58, SD = 1.345) found in competency six (see Table 13).

There were four items with a mode of 4 indicating that "applied" was the most frequent level of instruction for these competency items. These items were "Formulate a record keeping strategy to document student SAE outcomes based upon the concept of career pathway progression" from competency three (see Table 10), "Conduct an SAE supervisory visit and enlist the assistance of others in SAE supervision" from competency four (see Table 11), as well as "Design a curriculum unit in which students are introduced to the basic elements of record keeping as they relate to enterprise development and management" and "Adapt an SAE record keeping format appropriate for an enterprise in each of the four SAE types recognized by The National Council for Agricultural Education" from competency five (see Table 12).

In the third section of the survey instrument, respondents indicated the area of the agricultural education model that most closely approximates the focus of their institution's agricultural teacher education program. A heat map was used to show the areas of the agricultural education model that were selected by the respondents (see Figure 1). The heat map depicts areas that respondents (n = 55) selected in a color range from gray representing no response to bright red, with the areas selected most frequently depicted in bright red. The respondents most commonly indicated that they perceived the focus of their institution's agricultural teacher instruction to be somewhat centered in the middle of the agricultural education model with an emphasis toward the classroom/laboratory and, to a lesser extent, the FFA component.

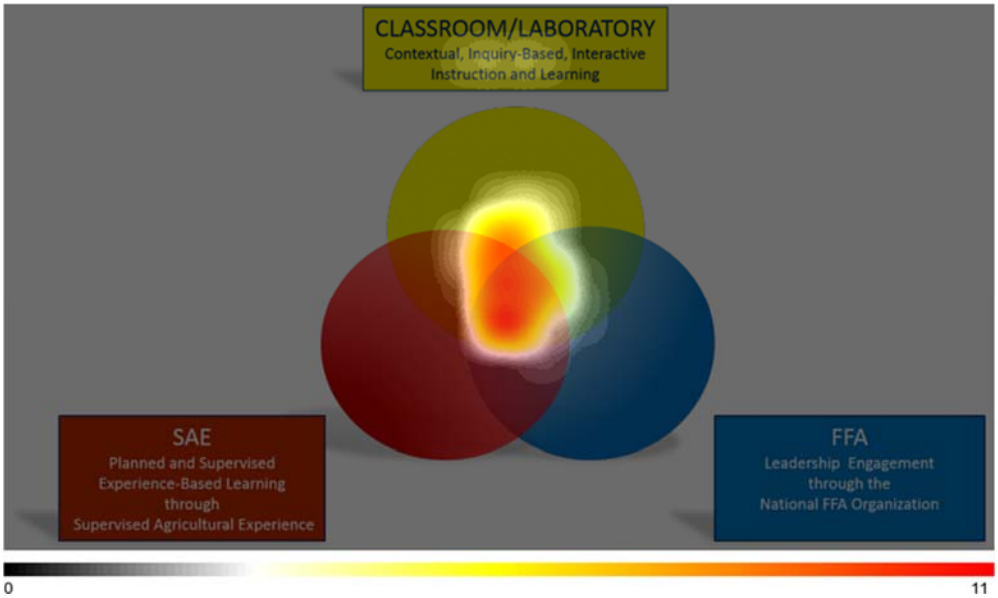

Figure 1. Focus *of* agricultural teacher education in relation to the SBAE model heat map. (n = 55)

Note. Color corresponds to the frequency of response. Scale: Gray = No Response (0); Bright Red = Multiple Responses (11)

Conclusions, Implications, and Recommendations

SAE content is embedded throughout the agricultural teacher education curriculum. Although each institution had its own unique curriculum and included SAE at varying points, nationally, SAE instruction is most commonly embedded within student teaching and in program planning courses. Interestingly, 34 (53.13%) undergraduate programs (n = 64) and 12 (44.44%) graduate programs (n = 27) indicated that they taught an SAE/Experiential Learning course. In a previous study of 10 selected agricultural teacher education programs, McLean and Camp (2000) found that although all of the institutions in their study reported teaching SAE or a similar topic, only three institutions (30%) reported a separate SAE course. The findings of the current study indicate a possible increase in the number of programs including separate SAE/Experiential Learning courses offered as a part of teacher preparation compared to the findings of McLean and Camp.

Although many (n = 39, 57.35%) of the institutions that participated in this study included all of the *Competencies for Teacher Preparation in SAE* (AAAE, 2013b) within their agricultural teacher education curriculum, there was a broad range in the level of instruction reported by individual programs. Among the 17 objectives associated with the 7 SAE teacher preparation competencies, 4 statements were most frequently rated as "Introduced" (*Mode* = 1), 9 statements were most commonly rated as "Emphasized" (*Mode* = 2), and 4 statements were most frequently rated as "Applied" (*Mode* = 4). Additionally, the large standard deviation for all statements indicated a wide variety among institutions in the level of instruction for each competency within their respective curriculum. The majority of the SAE teacher preparation competencies being rated as introduced and emphasized may contribute to how SAE is implemented in practice by agriculture teachers.

Interestingly, each of the statements that specifically mentioned recordkeeping had a mode of 4 indicating that most agricultural teacher education programs teach recordkeeping using a real-world or problem-solving method at the applied level. However, these recordkeeping statements each had medians that indicated the distribution of responses was centered on the "Emphasized" (*Mdn* = 2) response.

In contrast, the statement "Design a strategy to compare and contrast individual student progress toward selected college and/or career readiness, and prepare a summary report of finding to appropriate entities on a four-year time period" from competency six was the lowest rated statement overall (*Mdn* = 1.00, *Mode* =1, *M* = 1.58, *SD* = 1.345). One potential method to help teacher educators teach this objective of competency six in an applied manner is to incorporate it as a part of the recordkeeping instruction that is already being taught in a real-world or problem-solving context. For example, a recordkeeping unit could include using the report generating functions available in the AET to develop a report for the appropriate entities.

To be successful, agriculture teachers must be capable of facilitating SAE by actively supervising student projects through planning and visits (Roberts, Dooley, Harlin, & Murphrey, 2007). According to the NCAE (2015), "teachers should provide supervision of and guidance for the student's program while engaging other necessary partners such as parents and/or employers" (p. 1). Agricultural teacher education programs are using real-world or problem-solving methods to develop the SAE supervision skills of preservice teachers. The statement with the highest overall frequency of "Applied" responses (f = 29, 44.62%) was "conduct an SAE supervisory visit and enlist the assistance of others in SAE supervision" (*Mdn* = 3.00, *Mode* = 4, *M* = 2.89, *SD* = 1.252) from competency four. Further research should be conducted to determine where in the curriculum this objective is taught. A likely place to include applied learning in SAE supervision is within the

student teaching experience. However, there may be opportunities to incorporate applied supervision learning objectives embedded within EFE or other courses as well as in student teaching.

If teacher education in SAE is approached in an introduced or emphasized manner, preservice teachers may develop a conceptual knowledge or "know the politically correct answer" (Wilson & Moore, 2007, p. 89). However, agriculture teachers may lack the experience and the tools to overcome barriers to the implementation of SAE (Retallick, 2010; Wilson & Moore, 2007). Concrete experiences should be included in the preservice SAE curriculum. Kolb's (2015) experiential learning process can help preservice teachers make meaning of these concrete experiences through reflection and experimentation.

SAE is often thought of as the primary experiential learning component of the SBAE model (Baker, Robinson, & Kolb, 2012). As such, SAE instruction in agricultural teacher education should follow Kolb's (2015) experiential learning process. The experiential learning process is a cycle of grasping and transforming experience (Kolb, 2015). To complete the cycle and create knowledge, experience needs to be transformed through either reflective observation or active experimentation. It is possible that preservice teachers become stuck continually grasping experience, whether through concrete experience or abstract conceptualization, and never develop knowledge that could help overcome barriers to SAE implementation because the reflective observation and active experimentation modes are left to chance.

It is recommended that agricultural teacher educators purposefully incorporate experience and reflection through applied problem-solving or real-world experiences within their curriculum to move preservice teachers beyond a conceptual knowledge of the SAE competencies and develop a skill set to help agriculture teachers overcome barriers to the implementation and management of SAE.

Teacher educators have the task of making the most efficient use of the available time to prepare preservice teachers (Meyers & Dyer, 2004). Considering SAE is only one area and many other requirements must be included in teacher education, it may not be practical to teach each competency using a real-world or problem-solving method. It may be more practical, given the time limitations in teacher education, to target specific objectives to teach with applied methods within the curriculum that will help teachers to implement SAE programs. Research should be conducted to determine how and to what extent each of the AAAE preservice SAE competencies could be taught at an applied level to best prepare agriculture teachers to implement SAE programs. In addition, time for faculty to prepare new content to teach SAE may be an issue. In an effort to provide assistance to agricultural teacher educators, curriculum has been designed to teach these SAE competencies and is available free of charge (Barrick et al., 2015). Agricultural teacher educators can use these materials to help ensure that all of the SAE agricultural teacher preparation competencies are addressed in a coherent and structured manner.

The findings from this study provide a snapshot of one-moment-in-time and serve as a starting point to begin a conversation about how SAE should be taught in agricultural teacher education. Previous research has indicated that agriculture teachers value SAE and can talk about it conceptually. However, they are having difficulty implementing it in practice (Dyer & Osborne, 1995; Retallick, 2010; Wilson & Moore, 2007). Using applied methods and purposefully using the experiential learning process to teach the SAE competencies in the preservice curriculum may reduce the difficulty of implementing SAE programs.

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