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Secondary Agricultural Educators' Perceptions and Implementation of SAE and SAE for All

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Abstract

This study examined secondary agricultural education teachers' perceptions and implementation of SAE and the SAE for All framework. Since the rollout of SAE for All in 2018, little research has been conducted about its implications for school-based agricultural education (SBAE). A census of SBAE teachers in seven Midwest states was conducted in 2023. Descriptive statistics were calculated to measure teachers' perceptions and implementation of SAE and SAE for All. One-way ANOVAs and t-tests were used to compare differences in implementation and perceptions of SAE based upon teacher characteristics. SBAE teachers in this study expressed widely-ranging perceptions of SAE and SAE for All and variations in the implementation of SAE into local programs. The overall findings suggest that SBAE teachers hold slightly positive perceptions of the guiding principles of SAE and the SAE for All framework. A few differences in perceptions and implementation were identified based on teacher characteristics. Teachers' experiences had a greater influence on how they implemented SAEs in their programs. We recommend additional professional development related to the SAE for All framework and additional research to better understand the underlying philosophies teachers maintain related to SAE.

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Introduction and Literature Review

School-based agricultural education (SBAE) has maintained a long-standing tradition of comprising three components - classroom, FFA, and Supervised Agricultural Experience (SAE; National FFA Organization, 2023). Often referred to as the three-circle model, this structure prioritizes each component, including classroom instruction, experiential or work-based learning (SAE), and leadership development (FFA). Required supervision of work-based learning activities in agriculture has been an integral part of SBAE since 1917 with the adoption of the Smith-Hughes Act (Phipps et al., 2008). The Venn diagram used to illustrate this structure, depicts three equally-sized and partially overlapping circles, suggesting that each component of an SBAE program is emphasized similarly (National FFA Organization, n.d.). While all three circles appear the same size within the three-circle model, time and attention are often unequal across all three aspects (Shoulders & Toland, 2017).

In most SBAE programs, SAE is the component that receives the least amount of time and attention (Shoulders & Toland, 2017). Historically, research has found SAEs are beneficial for students yet difficult for teachers to implement (Dyer & Osborne, 1995; Retallick, 2010). Barriers to SAE implementation are well-documented and include limited opportunities for SAE involvement within local communities, a lack of resources, changing student demographics, and evolving schools (Lewis et al., 2012; Retallick, 2010; Steele, 1997; Wilson & Moore, 2007). Despite the limited attention given to SAE, research has identified positive outcomes associated with students having an SAE program. Benefits for students who have participated in SAEs include improvements in entry-level technical skills (Ramsey & Edwards, 2012), development of 21st-century skills (Thiel & Marx, 2019), and relationships with community members (Robinson & Haynes, 2011). To overcome decreasing SAE engagement, researchers have suggested more professional development, the development of curriculum and resources, and increased preservice teacher training to no avail (Rank & Retallick, 2016; Retallick, 2010; Wilson & Moore, 2007). Thus, it has been recommended that the underlying purpose of SAE be reviewed to ensure its value and alignment with today's SBAE teachers and students (Retallick, 2010).

The National Council for Agricultural Education held a summit in 2011 to identify high-quality, project-based learning opportunities in agricultural education. A national committee further explored and identified barriers that were perceived to inhibit making experiential and work-based learning a reality for all students in SBAE. Identified barriers to implementation included limited teacher time to conduct adequate supervision, fewer students coming from agricultural production backgrounds, fewer employment opportunities for students, lack of resources to create SAE programs, perceived administrative barriers of what programs students can become involved in locally, and a lack of understanding how SAE can contribute to student achievement (The Council, 2023). In 2015, based on the work of the national committee, the Council approved the "Philosophy and Guiding Principles for Execution of the Supervised Agricultural Experience Component of the Total School-Based Agricultural Education Program" intended to address barriers and provide opportunities for 100% SAE engagement for SBAE students (The Council, 2015).

The newly developed guiding principles expanded SAE types to include foundational and immersion SAEs. The foundational level SAE focused on providing every student enrolled in SBAE programs an opportunity to engage with career development experiences. Activities within the foundational level included career exploration and planning, personal financial planning and management, workplace safety, career and employability skills, and agricultural literacy. Immersion SAEs are intended to build upon a student's foundational SAE, allowing an intensive work-based learning experience that may include entrepreneurship/ownership, placement/internship, agriscience research, school-based enterprise, and service learning (The Council, 2023). Throughout the review process, the underlying purpose of SAE, to provide students with experiential and work-based learning in agriculture, has remained the same. The tool

that follows The Council's guiding principles and is intended to be used to reach 100% SAE engagement has been branded as SAE for All (The Council, 2023).

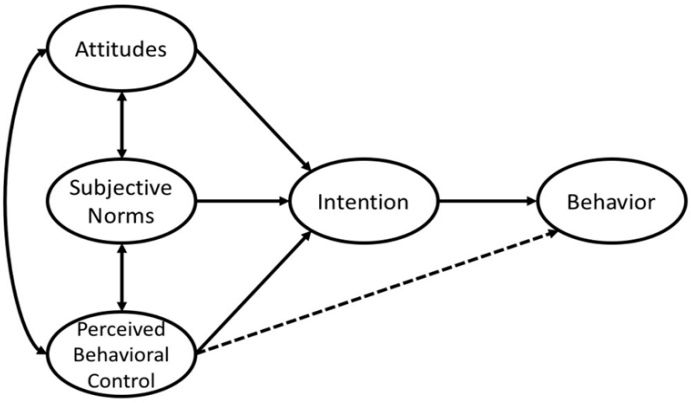
SAE for All was first introduced to the profession in 2018, with train-the-trainer events occurring with state leaders and teachers tasked with facilitating statewide rollouts of SAE for All nationwide in 2019. Many states' plans to roll out SAE for All were interrupted by the COVID-19 pandemic in 2020. Due to the disruption caused by the pandemic, training of preservice and in-service teachers regarding SAE for All has been sporadic and inconsistent across states. Nonetheless, some teachers across the Midwest have adopted the SAE for All framework into their programs. Yet, how the SAE for All framework has been implemented in those programs remains unknown.

Conceptual Framework

This study was situated within The Council's "Philosophy and Guiding Principles for Execution of the Supervised Agricultural Experience Component of the Total School-Based Agricultural Education Program" (The Council, 2015) and guided by the Theory of Planned Behavior (TPB; Ajzen, 1991).

Figure 1

Theory of Planned Behavior



Note. From "The Theory of Planned Behavior," by I. Ajzen, 1991, *Organizational Behavior and Human Decision Processes, 50*(2), p. 179–211. (https://doi.org/10.1016/0749-5978(91)90020-T).

The Theory of Planned Behavior (Ajzen, 1991) argues that a behavior can be predicted by the intention to perform it. Three factors, (1) attitudes toward the behavior, (2) perceived behavioral control, and (3) subjective norms, all impact an individual's intention to perform the behavior.

Within this study, teachers' implementation of SAE and SAE for All (i.e., the utilization of foundational SAEs and new immersion SAE categories) served as the behavior we sought to understand. The Council's guiding principles of SAE deductively framed the tasks used to measure the intention to implement and the actual implementation of SAE (The Council, 2015). The Council's SAE for All framework generated items to measure implementation and intention to implement SAE for All. To assess attitudes toward the implementation of SAE and SAE for All, a series of items were developed based on The Council's guiding principles of SAE (The Council, 2015). According to TBP, SBAE teachers' perceptions and attitudes toward SAE and SAE for All would influence their intention to implement, and ultimately, their decision to implement SAEs or the SAE for All framework into their program (Ajzen, 1991). Since previous research has suggested that SBAE teachers value SAE and have a positive attitude toward implementing SAE (Wilson & Moore, 2007), TBP suggests SAE implementation should be high.

However, teachers' perceptions and attitudes are not the only factor influencing a teacher's intention to implement SAEs. The Theory of Planned Behavior asserts that teachers' decision to implement SAEs or the SAE for All framework into their program is also influenced by perceived behavioral control (Ajzen, 1991). We know this to be true within the context of SAE research, as teachers have repeatedly argued that barriers prevent them from implementing SAEs completely across their programs (Lewis et al., 2012; Retallick, 2010; Steele, 1997; Wilson & Moore, 2007) even though they believe SAEs have value (Retallick, 2010; Wilson & Moore, 2007). With this in mind, common barriers were included in this study, such as supervision requirements, assessment expectations, and extended contract support.

Finally, subjective norms impact implementation decisions by considering the social pressure the individual perceives from peers based on intentions to perform the behavior (Ajzen, 1988, 1991). With the reactivated rollout of the SAE for All framework, it could be perceived by SBAE teachers there is social pressure to adopt new strategies and tools to implement SAEs into their program. Engagement in professional development could also influence subjective norms (Dierendonck et al., 2024); thus, we anticipate that SAE for All training will influence SAE adoption. Positive or negative subjective norms could also be influenced by the climate of the local community, administrative support, and statewide mandates regarding SAE implementation (Thiel & Marx, 2019).

Purpose and Objectives

This study explored SBAE teachers' implementation of SAEs and SAE for All components. It examined how implementation of SAE was influenced by teachers' perceptions of SAE and SAE for All, their perceived behavioral control in addressing barriers to implementation, and the impact of positive or negative subjective norms. The objectives of the study include:

1. Describe SBAE teachers' perceptions of the SAE Guiding Principles and the SAE for All framework.
2. Describe how SBAE teachers implement SAEs into their programs, including immersion and foundational SAEs.
3. Examine relationships between personal and professional factors and SBAE teachers' perceptions of SAE and SAE for All.
4. Examine relationships between personal and professional factors and SBAE teachers' implementation of SAEs.

Methods

The data analyzed for this paper are part of a larger, unpublished data set; therefore, methods may be similar or nearly identical to those used in other parts of the research. This descriptive study explored SBAE teachers' perceptions and implementation of The Council's guiding principles of SAE and the SAE for All framework. This quantitative exploratory study employed a cross-sectional survey design using a researcher-developed Qualtrics™-administered survey to collect data from SBAE teachers from the Midwest United States in the spring of 2023.

The survey was developed using the National Council for Agricultural Education's "Philosophy and Guiding Principles for Execution of the Supervised Agricultural Experience Component of the Total School Based Agricultural Education Program" as a framework. A total of 72 items were developed and included in the pilot instrument. These items addressed key components of the Council's guiding principles for SAE and components specifically related to the SAE for All framework. Once developed, a pilot test was conducted with a convenience sample of SBAE teachers nationwide. Social media was used to recruit pilot participants. A total of 28 SBAE teachers participated in the test/retest pilot study. Upon analyzing the results of the test-retest pilot, 14 questions were removed from the survey. To be retained, an item had to achieve either a .7 bivariate correlation between the test and retest responses or 75% of the respondents needed to be within a 1-point difference between the pre-test and post-test (DeVellis, 2017).

The population for this study consisted of SBAE teachers from seven Midwest states: Indiana, Iowa, Minnesota, Kansas, Nebraska, North Dakota, and South Dakota. For each state, a directory of SBAE teachers was obtained from State Staff and/or developed by the research team, which allowed for a census of SBAE teachers in the identified geographic area.

The survey was administered using the online survey software Qualtrics™ and sent to all SBAE teachers in the identified states (N = 1698) in January 2023. The final survey included a total of 58 items, plus demographic questions. The survey consisted of four sections: Section 1: Philosophical Beliefs about SAE (25 items); Section 2: SAE in Practice (25 items); Section 3: Principles of SAE for All (8 items); and Section 4: demographic questions (up to 21 items). The survey was expected to take fewer than 15 minutes to complete. To reduce non-response, a pre-notice was sent to SBAE teachers by the research team member from their state one week before the survey was sent out. The intent was to alert them of the upcoming research request, recognizing challenges with school district email systems identifying survey invitations as spam. The email invitation was sent on January 28, 2023, with three reminders sent to non-respondents on February 2, February 7, and February 12. In total, the survey was open for three weeks. Participation was encouraged by offering a chance to win one of seventeen $50 Amazon gift cards made possible through the support of The Council. A total of 433 surveys were completed (n = 433), achieving a 25.5% response rate. Surveys were evaluated for completeness, response set, and other completion errors. In total, 46 incomplete surveys were removed, leaving a final usable sample of 387(n), which yielded a 22.8% response rate. Non-response errors were checked using an independent samples t-test, and no differences were found between early and late respondents (Field, 2013). This method of checking non-response bias was used because we were concerned that the chief cause of non-response was related to the busy time of year during which the survey was conducted rather than an unwillingness to participate. See Tables 3, 4, and 5 for a complete list of instrument items.

Prior research informed the inclusion of demographic questions. Demographic questions included: (1) years of teaching experience (Dyer & Osborne, 1995); (2) pathway to licensure (Claflin et al., 2023); (3) prior SBAE, FFA, and SAE experience as a student (Rubenstein et al., 2014); (4) engagement in professional development training for SAE for All (Dierendonck et al., 2024); and (5) relevant state and local mandates related to SAE implementation (i.e., inclusion in content standards, implementation tied to funding, etc.) (Dyer & Osborne, 1995). Questions were also included to understand how teachers implemented SAEs into their SBAE program, including how SAEs were assessed and supervised. Finally, items were included to gather information about current student involvement in SAE, including (1) the percentage of students involved in all types of SAEs, (2) whether or not they have implemented Foundational SAEs and Immersion SAEs, and (3) the percentages of students who are involved in Foundational SAEs and Immersion SAEs. There were 21 demographic questions included in the survey, but due to the display and skip logic features on Qualtrics, not all questions fit every respondent.

Description of Respondents

Descriptive statistics were used to analyze the demographics of respondents, highlighted in Table 1. Of the seven states included in the study, the largest group of respondents in the sample (20.9%, n = 81) were teachers currently teaching in Minnesota, while the smallest group of teachers in the sample (7.2%, n = 28) reside in South Dakota. Most respondents were early career teachers with five or fewer years of experience (41.7%, n = 161) and 6 to 10 years of experience (18.1%, n = 70). Overwhelmingly, most participants entered the teaching profession through traditional means (85%, n = 328).

Table 1

*Demographic Characteristics of Participating Teachers (*n = *387)*

Variable	*n*	%
State		
Iowa	70	18.1
Indiana	47	12.1
Minnesota	81	20.9
Nebraska	67	17.3
North Dakota	45	11.6
South Dakota	28	7.2
Kansas	49	12.7
Years of Experience		
0-5 years	161	41.7
6-10 years	70	18.1
11-15 years	50	13.0
16-20 years	25	6.5
21-25 years	32	8.3
26 and more years	46	11.9
Missing	2	0.5
Pathway to the Teaching Profession		
Traditional Licensure	328	85.0
Alternative Licensure	49	12.7
Other	9	2.3

Relevant to this study, 324 participants reported SBAE involvement as students. Of those participants, 84.3% (*n* = 273) had participated in an SAE as an SBAE student, and many had earned either a State FFA (*n* = 94, 29.1%) or American FFA Degree (*n* = 149, 46.1%). About half of the participants had completed proficiency awards (*n* = 164, 50.6%).

Table 2

*Prior SBAE Experiences of Participating Teachers (*n = *323)*

Variable	*n*	%
Participation in SAE		
Yes	273	84.3
No	48	14.9
Missing	3	0.9
Highest FFA Degree Earned		
Discovery Degree	0	0.0
Greenhand Degree	5	1.5
Chapter Degree	66	20.1
State Degree	94	29.1
American Degree	149	46.1
Not Applicable	10	3.1
Completed a Proficiency Award Application		
Yes	164	50.6
No	160	49.4

Data Analysis

Teachers' perceptions of SAEs and SAEs for All were analyzed using descriptive statistics to report means and standard deviations of perceptions for each item in the instrument. We utilized frequencies to determine the number of respondents who answered "I don't know" to the statements. Descriptive statistics were used to assess the implementation of SAEs by calculating means and standard deviations of teachers' responses to items related to how teachers implement components of SAEs into their programs. Relationships between teachers' personal and professional characteristics and their perceptions or implementation of SAEs were assessed using a series of one-way ANOVAs (to compare more than two groups at a time) and *t*-tests (to compare two groups at a time). When significant ANOVAs were identified, post-hoc analysis was conducted using Gabriel's test to determine significant group comparisons (Field, 2013).

Results

Objective 1: Teachers' Perceptions of SAE and SAE for All

Objective one was to describe teachers' perceptions of SAE and SAE for All. Teachers were allowed to answer "I don't know" for these questions to enable teachers with no or limited knowledge of SAE or the guiding principles to respond accurately. Those responses were excluded from the analysis, which accounts for the inconsistent *n* noted for each item. The number of respondents who chose to respond "I don't know" to the statements about the SAE guiding principles ranged from 3 to 71 out of $n = 387$ respondents. The sample means of those who responded ranged from 2.89 to 3.84. Overall, SBAE teachers at least slightly agreed with 24 of the 25 statements about The Council's SAE Guiding Principles (The Council, 2015). Only one statement, "SAE should be tied to a career plan," achieved a mean below 3.00 ($M = 2.89$, $SD = 0.77$). Means and standard deviations of teachers' perceptions of the 25 items related to the guiding principles can be found in Table 3.

Table 3

*SBAE Teachers' Perceptions of SAE Guiding Principles (*n = *387)*

Question Stem	*M*	*SD*	*n**
Teachers should be provided extended contract days to facilitate SAE supervision.	3.84	0.42	15
SAE supervision can happen in several ways, including in person, onsite, in groups, using computer technology, or using social media.	3.82	0.40	26
Appropriate adult mentors should be involved in guiding a student's SAE.	3.76	0.49	16
The development of employability skills should be an SAE outcome.	3.75	0.50	7
SAEs should help students understand the expectations of the workplace.	3.67	0.57	3
Personal financial planning and management skills should be obtained through SAE involvement.	3.65	0.57	8
SAEs should provide all students an opportunity to develop competence in workplace safety.	3.61	0.57	6
Career exploration should be an outcome of SAE.	3.56	0.61	16
SAEs can be utilized to assess technical skill attainment.	3.51	0.61	10
Detailed SAE documentation is essential.	3.45	0.62	7
A student can work on their SAE during the school day.	3.44	0.67	17
Career planning should be a component of SAE.	3.42	0.66	19
Agricultural literacy should be an SAE outcome.	3.38	0.69	15

Question Stem	*M*	*SD*	*n**
SAE should be considered as a source of data for evidence of student growth.	3.35	0.63	3
SAE should be teacher-supervised.	3.34	0.68	12
It is appropriate for students to earn high school graduation credits for their SAE involvement.	3.32	0.77	38
Time and expertise spent supervising SAEs should be valued in a teacher's performance evaluation.	3.31	0.82	23
It is appropriate to use SAE documentation as a component of industry certification programs.	3.28	0.69	35
Application of classroom learning should be an outcome of SAE.	3.27	0.65	25
SAE supervision should occur on a year-round basis.	3.24	0.79	23
SAE should be a graded component of agricultural coursework.	3.21	0.82	29
A student can work on their SAE during formal classroom instructional time.	3.13	0.88	12
It is appropriate to use SAE documentation as a part of articulation agreements between secondary and post-secondary partners.	3.02	0.80	71
SAE should align with FFA award or recognition programs.	3.01	0.94	15
SAE should be tied to a career plan.	2.89	0.77	20

Note. 1- Strongly Disagree, 2- Slightly Disagree, 3-Slightly Agree, 4- Strongly Agree. *n** reports the number of individuals who responded "I don't know" to the prompt.

Table 4 includes the remaining means and standard deviations of teachers' perceptions of statements regarding SAE for All. Only "It is feasible to require Ag Ed students to complete an Immersion SAE," resulted in a mean below 3.00, indicating teachers slightly disagreed with the statement ($M = 2.62$, $SD = 0.87$). Though SBAE teachers at least slightly agreed with the other seven SAE for All statements, teachers seemed unsure of their beliefs as at least 6% ($n = 24$) of participants responded "I don't know" to 6 of the 8 SAE for All statements. Compared to teachers' perceptions of SAE Guiding Principles, only 6 of the 25 items resulted in more than 6% of teachers selecting "I don't know" for their response.

Table 4

*Teachers' Perceptions of SAE for All Framework (*n *= 387)*

Question Stem	*M*	*SD*	*n**
Engaging in an Immersion SAE will lead to positive student outcomes.	3.34	0.72	30
Engaging in a Foundational SAE will lead to positive student outcomes.	3.28	0.71	24
Adopting the SAE for All Framework will benefit my students.	3.20	0.76	26
The SAE for All framework makes student engagement in SAE more feasible.	3.17	0.69	30
Implementing the SAE for All Framework will benefit my community (employers, business, etc.)	3.17	0.76	42
It is feasible to require Ag Ed students to complete a Foundational SAE.	3.17	0.88	13
Transitioning to the SAE for All Framework will benefit me (as the Ag Teacher).	3.10	0.79	35
It is feasible to require Ag Ed students to complete an Immersion SAE.	2.62	0.87	11

Note. 1- Strongly Disagree, 2- Slightly Disagree, 3-Slightly Agree, 4- Strongly Agree. *n** reports the number of individuals who responded "I don't know" to the prompt.

Objective 2: Teachers' Implementation of SAEs

Objective two explored the implementation of SAEs by teachers at the local program level. Teachers were asked if they were required to implement SAEs and to indicate how they assessed and supervised SAEs. Table 5 compiles data regarding how teachers implemented SAEs.

Table 5

*Teachers' Reported Methods of Implementation of SAEs (*n *=361)*

Variable	*n*	%
SAE Implementation is Required		
Yes	88	25.9
No	246	74.1
Missing	1	0.2
Assessment Methods		
In Intro to Ag class	90	23.3
In all Ag Ed classes	176	45.5
In some Ag Ed classes	106	27.4
As a separate course	40	10.3
During the summer	125	32.3
Other	19	4.9
None of the above	23	5.9
Missing	2	0.5
Supervision Methods		
Visit them on location	270	69.8
Visit in class	294	76.0
Visit in groups	64	16.5
Visit via technology	101	26.1
Other	40	10.3
I do not supervise SAEs	22	5.7
Missing	3	0.8

Note. Respondents were allowed to select all that apply.

Only teachers incorporating SAEs into their programs responded to these prompts ($n = 361$). When teachers were asked to respond to how they implemented the same 25 guiding principles used to assess perceptions, most indicated implementing various aspects of SAE and SAE for All from occasionally to often (responses ranged from never to always). Additional details regarding teachers' reported implementation of SAE guiding principles can be found in Table 6.

Table 6

*Teachers' Implementation of SAEs within the SBAE Program (*n *= 361)*

Question Stem	*M*	*SD*
Students develop employability skills through their SAEs.	3.02	0.81
Appropriate adult mentors are involved in guiding a student's SAE.	3.02	0.78
SAEs are teacher-supervised.	3.02	0.77

Question Stem	*M*	*SD*
SAEs help students understand the expectations of the workplace.	2.95	0.68
Students develop agricultural literacy through their SAEs.	2.79	0.74
Students apply classroom learning in their SAEs.	2.89	0.66
Students obtain personal financial planning and management skills through their SAEs.	2.86	0.79
Career exploration is an outcome of SAE.	2.79	0.83
Detailed SAE documentation is expected.	2.75	0.77
SAEs are aligned with FFA awards or recognition programs.	2.73	0.78
Students develop competence in workplace safety through their SAEs.	2.81	0.76
I/we provide SAE supervision in several ways, including in groups, onsite, in-person, using computer technology, using social media, etc.	2.81	0.83
Career planning is a component of SAE.	2.65	0.79
Teachers are provided extended contract days to facilitate SAE supervision.	2.66	1.15
SAEs are a graded component of agricultural coursework.	2.62	1.08
SAE supervision happens on a year-round basis.	2.65	0.87
Students can work on their SAEs during the school day.	2.53	0.81
SAEs are tied to a career plan.	2.53	0.67
Students can work on their SAEs during formal classroom instructional time.	2.35	0.84
SAE data is used as a source of evidence of student growth.	2.20	0.87
SAEs are used to assess technical skill attainment.	2.05	0.83
Time and expertise spent supervising SAEs is valued in my/our performance evaluation.	1.75	0.97
Students earn high school graduation credits through their SAE involvement.	1.71	1.02
SAE documentation is used as a component of industry certification programs.	1.50	0.79
SAE documentation is used as part of articulation agreements between secondary and post-secondary partners.	1.45	0.82

Note. 1- Never, 2- Occasionally, 3-Often, 4- Always.

Even though implementation of SAE varied among teachers, teachers reported that just over half of their students participated in all forms of SAEs (58.2%), with 54.5% participating in Foundational SAEs and 47.9% engaging in Immersion SAEs. Of the 361 teachers who reported implementing SAEs into their programs, 69 (18%) reported 100% student participation in SAEs, while only 25 (6%) teachers reported not implementing SAEs.

Objective 3: Relationship between teachers' personal and professional factors and their perceptions of SAE and SAE for All

A series of *t*-tests and one-way ANOVAs were run to analyze the associations between teachers' personal and professional factors and their perceptions of the guiding principles of SAE and SAE for All. Of the 33

items analyzed across demographic categories, only four significant differences were identified based on teachers' years of experience. No significant differences were identified based on pathway to licensure or prior SBAE experiences, including whether or not they completed proficiency awards or what level FFA membership degree earned. Table 7 includes only significant ANOVA results and significant group-level comparisons for years of experience. Though significant, resulting omega-squared values indicate a low effect size ranging from .02 to .04, meaning teachers' years of experience can only explain about 2 to 4% of the total variance of teachers' perceptions of SAE for each significant item (Field, 2013).

Table 7

*Association Between Teacher Characteristics and Perceptions of SAE Philosophies (*n *= 387)*

Demographic Characteristic		*df*	*F*	*ΔM*	*SE*	ω^2	*p*
Item #2 SAE should align with FFA award and recognition programs							
Years of Experience							
Group 1	Group 2	5, 363	2.37			.02	.039
0-5 years of experience	16-20 years of experience			.61	.20		.02
Item #3 SAE should be teacher-supervised							
Years of Experience							
Group 1	Group 2	5, 365	2.68			.02	.022
0-5 years of experience	26+ years of experience			-.37	.12		.01
Item #5 SAE supervision can happen in several ways, including in person, onsite, in groups, using computer technology, or using social media							
Years of Experience							
Group 1	Group 2	5, 352	3.92			.04	.002
0-5 years of experience	6-10 years of experience			-.20	.06		.01
	21-25 years of experience			-.22	.08		.04
Item #16 It is appropriate to use SAE documentation as a component of industry certification programs							
Years of Experience							
Group 1	Group 2	5, 317	3.29			.03	.025
16-20 years of experience	0-5 years of experience			-.45	.16		.03
	6-10 years of experience			-.68	.17		.00
	26+ years of experience			-.57	.18		.03

Note. Due to space limitations, only significant ($p < .05$) ANOVAs and post hoc comparisons are included in the table. Please reach out to the corresponding author for the full table of results.

Teachers' experiences, however, did seem to influence their perceptions related to SAE and SAE for All, and the effect was notable, with Cohen's *d* effect sizes ranging from .40 (small effect) to .83 (large effect). For example, teachers who were required to implement SAEs believed utilizing the SAE for All framework would benefit their students ($M = 3.54$, $SD = .73$) compared to those who were not required to implement SAEs ($M = 3.24$, $SD = .90$). Additional significant comparisons between groups of teachers that do and do

not assess SAEs can be found in Table 8. Item by item comparisons that were not significantly different between teachers who did or did not assess SAEs are not included in Table 8, but are important to note.

Table 8

*The Difference in Teachers' Perceptions of SAE based upon Assessment (*n = *387)*

	n	M	SD	SE	t	df	Sig. (2-tailed)	*d*
Item #5: SAE supervision can happen in several ways…					2.10*	20.8	.048	.47
Assesses SAE	327	3.84	0.37	0.02				
Does not assess SAE	21	3.52	0.68	0.15				
Item #17: SAEs can be utilized to assess technical skill attainment					2.40	362	.017	.46
Assesses SAE	341	3.53	0.60	0.03				
Does not assess SAE	23	3.22	0.67	0.14				
Item #18: It is appropriate for students to earn high school graduation credits for their SAE involvement					2.43	335	.016	.44
Assesses SAE	318	3.33	0.75	0.04				
Does not assess SAE	19	2.89	0.99	0.23				
Item #19: SAEs should be a graded component of agricultural coursework					3.93	344	<.001	.83
Assesses SAE	325	3.24	0.81	0.05				
Does not assess SAE	21	2.52	0.87	0.19				
Item #52: It is feasible to require Ag Ed students to complete a Foundational SAE					2.12	360	.034	.40
Assesses SAE	340	3.18	0.87	0.05				
Does not assess SAE	22	2.77	1.02	0.22				

Note. * indicates the *t*-test does not assume equal variances. Due to space limitations, only significant ($p < .05$) comparisons are included in the table. Please reach out to the corresponding author for the full table of results.

Objective 4: Relationship between teachers' professional and personal factors and their implementation of SAE

One-way ANOVAs and t-tests were used to analyze the association between teachers' personal and professional characteristics, including their experiences and their implementation of SAEs. There were notable associations between teachers' prior experiences as SBAE students, their participation in SAE and proficiency awards, and their pathway to Ag Ed licensure. Only the results of significant t-tests are reported in Table 9.

Table 9

*Teachers' Implementation of SAEs within the SBAE Program (*n = *361)*

Question Stem	*Pathway*	*Ag Ed*	*SAE*	*Proficiencies*
Detailed SAE documentation is expected	----------	----------	----------	2.10(301) = .037
SAEs are aligned with FFA awards or recognition programs	----------	2.15(355) = .032	----------	----------
I/we provide SAE supervision in several ways, including…	----------	----------	1.99(287) = .047	2.97(287) = .003
Students apply classroom learning in their SAEs	----------	-2.68(345) = .008	----------	2.13(291) = .034
SAE supervision happens on a year-round basis	2.67(351) = .008	----------	2.42(297) = .016	3.14(297) = .002
Teachers are provided extended contract days to facilitate SAE supervision	4.98(355) = <.001	----------	2.29(301) = .023	2.25(301) = .025
Time and expertise spent supervising SAEs is valued in my/our performance evaluation	2.40(77) = .019*	----------	2.28(64) = .020*	----------
SAE data is used as a source of evidence of student growth	----------	----------	----------	2.26(302) = .025
SAE documentation is used as a component of industry certification programs	----------	----------	----------	2.29(271) = .023*
SAE documentation is used as part of articulation agreements between secondary and post-secondary partners	----------	----------	2.32(65) =.023*	----------
SAEs are used to assess technical skill attainment	----------	----------	----------	2.09(303) = .037
Students develop employability skills through their SAEs	----------	-2.20(355) = .014	----------	----------

Note. *indicates the *t*-test does not assume equal variances. Due to space limitations, only significant ($p < .05$) comparisons are included in the table. Please reach out to the corresponding author for the full table of results. Pathway compares traditional vs. other methods of licensure, Ag Ed compares prior SBAE experience as a student versus no prior SBAE experience as a student, SAE compares prior SAE experience as a student versus no prior SAE experience as a student, and Proficiencies compares prior experience with proficiency awards as a student versus no prior experience with proficiency awards as a student.

Of the 25 total items (see Table 6), only three items resulted in significantly different implementation between teachers who entered the classroom through a traditional pipeline and those who entered the classroom through an alternative pathway. When comparing teachers who were and were not members of SBAE as a student, there were only three items that were significantly different between the two groups. How SAEs were implemented was significantly different between teachers who had SAEs when they were students and those who did not for five of the 25 items.

Differences in SAE implementation based upon personal and professional characteristics were identified between teachers who completed proficiency awards as students and those who had not, which resulted in eight significant comparisons out of 25. Overwhelmingly, personal and professional characteristics did not result in statistically significant differences in how teachers implement SAEs into their programs. Additionally, differences in the implementation of SAEs were noted between teachers who were required to use SAEs in their programs and those who were not in ten of the 25 items. Table 10 reports only the results of significant t-tests.

Table 10

*The Difference in Teachers' Implementation of SAE based upon Requirements (*n *= 361)*

	n	M	SD	SE	t	df	Sig. (2-tailed)	*d*
Item #26: Detailed SAE documentation is expected					2.26	359	.025	.26
Required to implement SAE	97	2.93	.81	.08				
Not required to implement SAE	264	2.72	.78	.05				
Item #28: SAEs are teacher supervised					1.98	359	.049	.23
Required to implement SAE	97	3.21	.80	.85				
Not required to implement SAE	264	3.02	.82	.05				
Item #36: SAE supervision happens on a year-round basis					2.74	359	.006	.33
Required to implement SAE	97	2.92	.91	.09				
Not required to implement SAE	264	2.62	.93	.06				
Item #37: Teachers are provided extended contract days to facilitate SAE supervision					3.69*	182.7	<.001	.43
Required to implement SAE	97	3.03	1.09	.11				
Not required to implement SAE	264	2.54	1.18	.07				
Item #38: Time and expertise spent supervising SAEs is valued in my/our performance evaluation					3.86*	149.6	<.001	.47
Required to implement SAE	97	2.14	.96	.06				
Not required to implement SAE	264	1.65	.87	.09				
Item #39: SAE data is used as a source of evidence of student growth					2.41	359	.017	.28
Required to implement SAE	97	2.40	.87	.09				
Not required to implement SAE	263	2.15	.90	.06				
Item #40: SAE documentation is used as a component of industry certification programs					2.47	358	.014	.29
Required to implement SAE	97	1.87	1.13	.12				
Not required to implement SAE	263	1.56	.99	.06				
Item #41: SAE documentation is used as part of articulation agreements between secondary and post-secondary partners					2.03*	139.5	.044	.25
Required to implement SAE	97	1.72	1.15	.12				
Not required to implement SAE	263	1.46	.88	.05				
Item #42: SAEs are used to assess technical skill attainment 3.17					2.53	359	.012	.31
Required to implement SAE	97	2.24	.86	.09				
Not required to implement SAE	264	1.98	.83	.05				

	n	M	SD	SE	t	df	Sig. (2-tailed)	*d*
Item #43: Students earn high school graduation credits through their SAE involvement					3.64*	153.4	<.001	.45
Required to implement SAE	97	2.06	1.12	.11				
Not required to implement SAE	264	1.59	.98	.06				

Note. Due to space limitations, only significant ($p < .05$) comparisons are included in the table. Please reach out to the corresponding author for the full table of results.

The largest number of significant associations between teachers' experiences and implementation were identified among groups of teachers based on how they assess and supervise SAEs. Of the 25 comparisons made, nine implementation methods were found to be significant based on teachers' assessment methods and seventeen were significant based upon supervision method. Additionally, those comparisons resulted in small to large effect sizes, ranging from omega squared values of .03 to .21. The nine significant ANOVAs and the resulting significant post hoc comparisons between groups based upon assessment method are included in Table 11.

Table 11

*Association Between Assessment Strategies Used and Implementation of SAE Components (*n *= 387)*

Demographic Characteristic		*df*	*F*	*ΔM*	*SE*	ω^2	*p*
Item #26: Detailed SAE documentation is expected							
Group 1	Group 2	7, 349	5.96			.09	<.001
In all Ag Ed classes	In Intro Ag Class			.66	.17		.001
	No Assessment			.87	.22		<.001
During the summer	In Intro Ag Class			.90	.24		.007
	No Assessment			1.12	.28		.003
In several ways	No Assessment			.66	.22		.020
Item #30: SAE Supervision is provided in several ways, including in groups, onsite, in-person, using computer technology, using social media, etc.							
Group 1	Group 2	7, 334	3.44			.05	.001
In all ag ed classes	Other assessment			.87	.32		.037
In several ways	In Intro Ag Class			.58	.18		.019
	Other assessment			.93	.31		.016
Item # 36: SAE supervision happens on a year-round basis							
Group 1	Group 2	7, 344	3.25			.04	.002
In several ways	In Intro Ag class			.61	.20		.027
	In some Ag Ed classes			.53	.16		.014
Item # 37 Teachers are provided extended contract days to facilitate SAEs.							
Group 1	Group 2	7, 348	3.89			.04	.004
In several ways	In some Ag Ed classes			.68	.21		.019

Demographic Characteristic		*df*	*F*	*ΔM*	*SE*	ω^2	*p*
Item #39: SAE data is used as a source of evidence of student growth							
Group 1	Group 2	7, 350	2.24			.04	.004
In all Ag Ed classes	No assessment			.97	.26		<.001
Item #42: SAEs are used to assess technical skill attainment							
Group 1	Group 2	7, 351	1.83			.03	.009
In all Ag Ed classes	No assessment			.82	.25		.006
Item #43: Students earn high school graduation credits through their SAE involvement							
Group 1	Group 2	7, 351	5.16			.08	<.001
During the summer	In Intro Ag class			1.08	.33		.028
	In all Ag Ed classes			.85	.27		.014
	In some Ag Ed classes			1.12	.30		.004
	Other Assessment			1.47	.43		.017
	No Assessment			1.47	.38		.004
Item #44: SAEs are a graded component of agricultural coursework							
Group 1	Group 2	7, 350	13.49			.21	<.001
In all Ag Ed classes	In Intro Ag Class			1.08	.22		<.001
	In some Ag Ed classes			.65	.17		.004
	As a separate course			1.67	.49		<.001
	Other Assessment			1.92	.35		<.001
	No Assessment			2.09	.29		<.001
	In several ways			.683	.12		<.001
In some Ag Ed classes	Other assessment			1.28	.37		.007
	No Assessment			1.44	.32		<.001
During the summer	Other Assessment			1.35	.42		.033
	No Assessment			1.52	.37		.001
Item #45: Career Exploration is an outcome of SAE							
Group 1	Group 2	7, 350	1.65			.03	.018
In All Ag Ed Classes	Other Assessment			.83	.30		.039
In several ways	Other assessment			.87	.30		.021
	No Assessment			.70	.25		.039

Note. Due to space limitations, only significant ($p < .05$) comparisons are included in the table. Please reach out to the corresponding author for the full table of results.

How SBAE teachers supervised SAEs also led to several significant comparisons among the 25 items that addressed how SAEs were implemented. For these *t*-tests, comparisons were made between teachers who supervised SAEs onsite (at a student's SAE site) versus those who supervised SAEs elsewhere. Seventeen of the 25 implementation items resulted in significant comparisons with Cohen's *d* effect sizes ranging from

small (d = .26), medium (d = .54), to large (d = .98). Only the 17 significant comparisons are included in Table 12.

Table 12

*The Difference in Teachers' Implementation of SAE based upon Supervision Practices (*n = *361)*

	n	M	SD	SE	t	df	Sig. (2-tailed)	*d*
Item #26: Detailed SAE documentation is expected					2.64	341	.009	.37
Supervise onsite	258	2.83	.78	.05				
Supervise elsewhere	85	2.58	.68	.07				
Item #27: SAEs are aligned with FFA awards or recognition programs					3.45	341	<.001	.40
Supervise onsite	258	2.81	.74	.05				
Supervise elsewhere	85	2.48	.83	.09				
Item #28: SAEs are teacher supervised					2.75*	121.8	.007	.33
Supervise onsite	254	3.11	.69	.04				
Supervise elsewhere	84	2.83	.85	.09				
Item #29: Appropriate adult mentors are involved in guiding a student's SAE					3.35	336	<.001	.41
Supervise onsite	254	3.09	.75	.05				
Supervise elsewhere	84	2.77	.78	.09				
Item #30: I/we provide SAE supervision in several ways, including in groups, onsite, in-person…					5.57	327	<.001	.31
Supervise onsite	249	2.97	.78	.05				
Supervise elsewhere	80	2.41	.77	.09				
Item #31: Students apply classroom learning in their SAEs					2.61	331	.009	.33
Supervise onsite	251	2.94	.64	.04				
Supervise elsewhere	82	2.73	.63	.07				
Item #35: SAEs help students understand the expectations of the workplace					2.71*	125.8	.008	.34
Supervise onsite	259	3.02	.64	.04				
Supervise elsewhere	84	2.77	.73	.08				
Item #36: SAE supervision happens on a year-round basis					6.81	336	<.001	.86
Supervise onsite	254	2.84	.82	.05				
Supervise elsewhere	84	2.14	.81	.09				
Item #37: Teachers are provided extended contract days to facilitate SAE supervision					7.67	340	<.001	.98
Supervise onsite	258	2.92	1.07	.07				
Supervise elsewhere	84	1.89	1.05	.12				
Item #38: Time and expertise spent supervising SAEs is valued in my/our performance evaluation					4.58*	191.5	<.001	.62
Supervise onsite	257	1.86	1.02	.06				
Supervise elsewhere	85	1.39	.76	.08				

	n	M	SD	SE	t	df	Sig. (2-tailed)	*d*
Item #39: SAE data is used as a source of evidence of student growth					3.03	342	.003	.54
Supervise onsite	259	2.29	.85	.05				
Supervise elsewhere	85	1.96	.88	.10				
Item #42: SAEs are used to assess technical skill attainment					2.62	343	.009	.31
Supervise onsite	260	2.10	.80	.05				
Supervise elsewhere	85	1.84	.84	.09				
Item #43: Students earn high school graduation credits through their SAE involvement					2.16*	157.2	.032	.26
Supervise onsite	260	1.78	1.05	.07				
Supervise elsewhere	85	1.52	.95	.10				
Item #46: Career planning is a component of SAE					2.22	342	.027	.26
Supervise onsite	259	2.70	.76	.05				
Supervise elsewhere	85	2.48	.84	.09				
Item #48: Students obtain personal financial planning and management skills through their SAEs					2.95	334	.003	.38
Supervise onsite	253	2.93	.78	.05				
Supervise elsewhere	83	2.64	.77	.09				
Item #49: Students develop competence in workplace safety through their SAEs					2.76	331	.006	.35
Supervise onsite	250	2.88	.74	.05				
Supervise elsewhere	83	2.61	.78	.09				
Item #50: Students develop agricultural literacy through their SAEs					2.55	320	.011	.32
Supervise onsite	242	2.83	.71	.05				
Supervise elsewhere	80	2.60	.72	.08				

Note. Due to space limitations, only significant ($p < .05$) comparisons are included in the table. Please reach out to the corresponding author for the full table of results.

Discussion and Conclusion

This study explored teachers' perceptions and implementation of Supervised Agricultural Experience (SAE) and the SAE for All Framework. The overall findings indicate that the School-Based Agricultural Education (SBAE) teachers who participated in this study have positive attitudes toward the guiding principles of SAE and the SAE for All Framework.

Despite a decline in participation in SAE (Wilson & Moore, 2007), agricultural educators nationwide express agreement that SAE is, and should continue to be, a fundamental component of SBAE due to the numerous benefits for students (Ramsey & Edwards, 2012; Retallick, 2010; Robinson & Haynes, 2011; Thiel & Marx, 2019; Wilson & Moore, 2007). Among the 387 participating teachers, only 25 indicated they were not implementing some form of SAEs in their programs. Though levels of SAE implementation varied among teachers, it is promising that, on average, participants reported at least 50% of their students

participated in SAEs, including 69 (18%) teachers who reported 100% student involvement in SAE. While the ultimate goal is 100% engagement in SAE for all SBAE students, it is encouraging to witness some teachers already reaching this milestone.

Well-established barriers to SAE implementation drove the development of the SAE for All framework (Lewis et al., 2012; Retallick, 2010; Steele, 1997; Wilson & Moore, 2007). The study's findings reveal an expansive range of knowledge among participants regarding SAE and the SAE for All framework. When understanding the SAE guiding principles, more than 24 participants responded with "I don't know" to 24% of the 25 items. In contrast, far fewer participants expressed confidence in their understanding of the SAE for All framework, with over 24 responding with "I don't know" for 75% of the items. The discrepancy between the understanding of SAE guiding principles and SAE for All components may be attributed to the disruptions caused by the COVID-19 pandemic during the rollout of SAE for All, which impacted training and contributed to varied knowledge and perceptions among the participants.

Though the findings are only representative of the participants in this study, we recommend SBAE teachers participate in quality professional development related to SAE for All as the initiative is reintroduced. This approach addresses misconceptions and misunderstandings that may have arisen during the disruptions. Applying Azjen's Theory of Planned Behavior (1991), fostering a positive attitude toward professional development, and establishing a unified call for broader SAE implementation can promote favorable subjective norms. Moreover, addressing historical barriers to SAE implementation through SAE for All training may positively influence teachers' perceived behavioral control, leading to increased intentions and, ultimately, greater utilization of SAE nationwide.

The most noteworthy insight gained from this study is the impracticality of generalizing teachers' perceptions of SAE based on demographic characteristics alone. This conclusion is based upon the comparisons between groups of teachers that did not result in significant differences in perceptions. This implies that predicting SBAE teachers' views on SAE or SAE for All cannot be solely based on factors like their years of experience, licensure method, or prior experiences as SBAE students. Instead, the study underscores that those experiences, such as assessing SAEs, had a greater influence on the participating teachers' perceptions of SAEs.

Moreover, it is important to note that teachers' experiences can influence how they incorporate SAEs into their SBAE programs. For instance, participants who completed proficiencies as students tended to implement various SAE components more actively than their counterparts. Additionally, teachers who were compelled to supervise SAEs or were involved in assessing them exhibited greater alignment with the SAE guiding principles in their implementation than their peers. Notably, the educators who actively implement SAEs tend to have more favorable perspectives on the SAE for All framework, which leads us to believe that using the SAE for All framework may help teachers overcome barriers and increase student engagement.

Changing how SAEs are implemented may require more work for some teachers. This is highlighted by the fact that teachers who engaged in SAEs as students and completed proficiency awards also tended to implement SAEs more in line with the guiding principles than their peers who did not complete proficiency awards as youth. It seems there is a tradition around SAE and how they should be implemented. Though professional development is recommended for all teachers, we urge teacher educators and state staff to scrutinize their training approaches for preservice teachers, new teachers, alternatively licensed teachers and those without previous backgrounds in Agricultural Education to ensure SBAE teachers see the value of SAE beyond just being a tradition. The emphasis should be on adopting the SAE for All framework, specifically focusing on the significance of the Foundational SAE concept and the development of career-ready agricultural education students.

The findings of this study shed light on the understanding and perceptions of SBAE teachers in the Midwest regarding SAE, as well as their current implementation practices. However, we acknowledge the study's limitations in terms of generalizability, primarily due to its regional focus, which may not represent a nationwide perspective on teachers' perceptions of SAE and SAE for All. Additionally, a higher response rate would improve the reliability of the findings. A study conducted with a nationwide random sample with less non-response would provide a valuable benchmark moving forward, particularly as the impact of the SAE for All rollout are reassessed.

The present study emphasizes the importance of assessing existing knowledge, beliefs, and implementation of SAEs as a foundational step before delving into more complex research. While survey research was employed in this study, we acknowledge its inherent limitations in providing in-depth information from participants. In light of these limitations, we recommend utilizing qualitative research to gain a deeper understanding of the underlying philosophies that influence SBAE teachers' adoption of SAE components, particularly within the context of the SAE for All framework. The call for additional research extends to exploring the outcomes and impacts of SAE implementation on students, teachers, schools, and communities. This recommendation becomes especially relevant considering the reintroduction of the SAE for All framework, suggesting a need for more comprehensive insights into the effects of this approach on SBAE programs and teachers.

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