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Teacher Perceptions of Student Growth and Successful Supervised Agricultural Experiences

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Abstract

With the debut of SAE for All, it is imperative student growth catalyzed by supervised agricultural experiences (SAEs) be measured to understand the general efficacy of SAEs as well as the specific impact of the SAE for All initiative. In the three-component model, Classroom/Laboratory Instruction, FFA, and SAE are represented as being equal, but it is unclear if teachers view student growth emanating equally from these three experiences. Quantitative elements of a statewide survey were utilized to measure teacher perceptions of student growth attributed to each of the three components of school-based agricultural education (SBAE), along with programmatic factors that may influence student growth attributed to SAE. Additionally, qualitative survey elements were analyzed detailing how teachers define a successful SAE and barriers to SAEs. The classroom component was found to have the greatest impact on student growth, whereas SAE was found to be the least impactful. Teachers who grade SAEs and those who have students log hours from their phones found the most growth attributed to SAEs. Teachers identified successful SAEs are student driven and the most common barrier to SAE implementation was time. Recommendations are explored which inform continued growth and impact through SAEs via practice and continued scholarship.

Introduction

Supervised agricultural experiences (SAEs) have been identified as an integral component of school-based agricultural education (SBAE). An SAE is defined as a "student-led, instructor supervised, work-based learning experience that results in measurable outcomes" (The National Council for Agricultural Education, 2021, p. 2). In the three-component model, SAEs are depicted as one-third of SBAE programming (Croom, 2008). As one of the three primary components of SBAE (i.e., SAE, FFA, and classroom/laboratory instruction), an SAE should play a critical role in all students' programs (Croom, 2008; Shoulders & Toland, 2017). While the three-component model has been employed for years, it is unclear how much student growth stems from SAEs. With the debut of the *SAE for All* initiative and a push for teachers to improve their SAE programming, it is critical to examine the role SAE plays in student development.

In addition to identifying student growth associated with SAEs, consideration should be given to the differences in SAE opportunities. These differences include, as examples, the integration of SAEs within classroom instruction and how frequently students are visited during their SAEs. Differences in SAEs are, in part, the product of how teachers conceptualize quality SAEs and barriers teachers identify to SAE implementation. Building an understanding of teacher conceptualization of SAEs, different SAE experiences, and student growth attributed to SAEs has the potential to inform SAE practices through identification of teacher conceptualizations and practices aligned with increased student growth.

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Without the continuous evaluation of SAEs, it is unclear how impactful SAEs are to student growth and development across time. If SAEs are demonstrated as ineffective in an age of a teacher shortage (Ingersoll, 2003; Smith et al., 2023; Sutcher et al., 2016), perhaps it is best to rethink SAE implementation and importance. Furthermore, if there are practical SAE implementation practices that benefit both teachers and students, those should be identified and explored. If we are striving to achieve *SAE for All*, we cannot neglect to evaluate the perceived efficacy of SAEs and SAE implementation strategies.

Literature Review

There exists a longstanding history of SAE research detailing positive impacts on students (Dyer & Williams, 1997; Rank & Retallick, 2016). Haddad and Marx (2018), however, noted growth is more dependent on student investment within their SAE than simply having an SAE. This sentiment is echoed by Bolton et al. (2018), with student initiative being important to a successful SAE. The importance of differences among SAE experiences was supported by Theil and Marx (2019) who found students engaged in agriscience SAEs were more efficacious in skills like communication and leadership. Mouser et al. (2019) identified SAE programming as a part of high quality programming, which in turn allows students to be more career ready than their same-grade non-SBAE peers. In total, scholarship suggests realizing the growth potential of SAEs depends on student (e.g., energy) and programmatic (e.g., SAE type, teacher implementation) factors.

SAE Implementation Factors

Given the importance of implementation, further investigation into the ways SAEs are operationalized is warranted. Research conducted by Lewis et al. (2012) suggests attention to SAE varies, with students receiving between nine and 34 days of instructional time on SAEs. Another point of variety is grading SAEs, with research suggesting half of programs grade SAEs and half of programs do not (Lewis et al., 2012). Research (Rubenstein et al., 2016) has identified additional best practices for SAE facilitation (e.g., classroom supervision, using previous student examples). Otherwise, the depth and breadth of research is lacking. Therefore, the current study includes a broadened analysis of SAE implementation.

The urgency of scholarship on SAEs is compelled, in part, by research indicating declining student participation in SAEs (Croom, 2008; Steele, 1997). In fact, Lewis et al. (2012) found under 50% of school-based agricultural education students had an SAE. Shoulders and Toland (2017) found that Arkansas teachers dedicated 13.7% of their programs to SAE implementation, 36.4% to FFA, and 49.0% to classroom instruction. These authors identified that a "light emphasis" on SAE was the most common among Arkansas teachers (p. 91). Lack of participation in SAE can be attributed to both student and teacher factors. For students, limited resources and motivation have been historical barriers (Dyer & Osborne, 1995). For teachers, time management and changing SAE structures are obstacles (Doss & Rayfield, 2019). Teacher self-efficacy may be an obstacle for SAE implementation as well (Sweet Moore et al., 2023; Toombs et al., 2022).

The state of SAE usage and implementation today is unclear, though initiatives like *SAE for All* are trying to increase the usage of SAEs. Furthermore, expanding SAEs to include areas like agricultural communications may help to remove some barriers, like students having enough space at home for other projects (Swenson et al., 2021). Allowing students to complete SAEs in agricultural mechanics during class time was another solution provided by Doss et al. (2019). As teachers may be inexperienced in some SAE areas, professional development and training opportunities specific to SAE implementation are recommended to improve teacher self-efficacy (Doss et al., 2019; Hendon et al., 2019; Swenson et al., 2021; Toombs et al., 2022). Regardless, teachers are an important unit of analysis to consider when exploring SAE implementation.

Conceptualizations of SAEs

Quality SAEs are widely defined. In a study by Robinson and Haynes (2011), alternatively certified teachers expressed that a quality SAE would allow students to develop important life skills in an experiential way. This sentiment is the core of a successful SAE. This is illustrated by American FFA Degree Star Finalists in work done by Rubenstein and Thoron (2014), who also emphasized goal setting, the importance of external support, financial gains, personal satisfaction, award earning, and record keeping as important components of their successful SAEs. In work with teachers who had exemplary SAE programming at their rural schools, Rubenstein and Thoron (2015) found teacher commitment, concrete SAE examples, and requiring an SAE were elements of SAE programming success. Additionally, student-centered SAEs were a key element of teacher success. Bolton et al. (2018) emphasized teacher involvement in SAEs via visits and communication, though a common form of SAE evaluation for all students was discouraged.

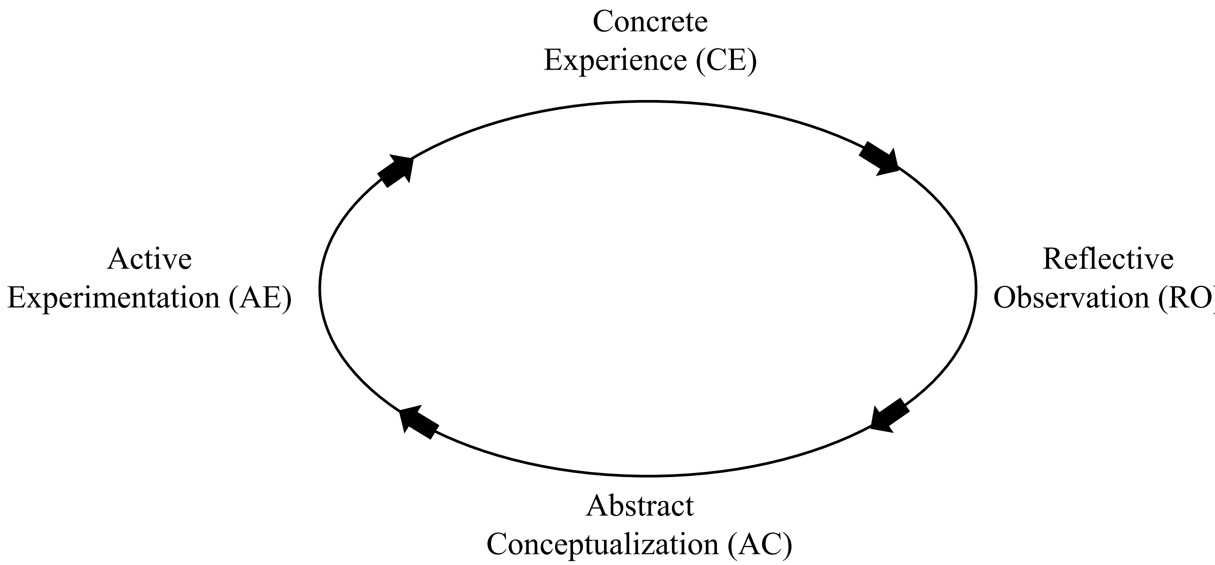
SAEs are valued by principals and teachers (Doss & Rayfield, 2021), though a paradox between teachers valuing SAEs and SAE implementation was highlighted by Wilson and Moore (2007). Wilson and Moore found that, while teachers say they value SAEs and recognize they are an important programmatic component, there are barriers to implementation that are challenging to overcome (i.e., lack of teacher and student time and lack of student motivation). Barriers to implementation were also a theme in a study by Robinson and Haynes (2011), with teachers highlighting student interest, time constraints, and financial concerns as quality SAE inhibitors. SAEs are often valued through FFA awards and recognition (Retallick, 2010; Robinson & Haynes, 2011; Wilson & Moore, 2007), which adds a layer of complexity to SAEs being valued intrinsically. Sweet Moore et al. (2023) identified the importance of all students having an SAE and keeping a record book declined after pre-service teachers finished student teaching. Given the centrality of SAE within school-based agricultural education, continued research exploring SAE implementation and student growth is critical.

Theoretical Framework

SAEs are consistently described as experiential learning (Baker et al., 2012; Lewis et al., 2012); therefore, Dewey and Kolb's conceptualizations of experiential learning served as the framework for this study. In their conceptualizations, learning is the product of experience (Dewey, 1938). Furthermore, experiential learning is not an isolated experience; rather, a multi-staged, cyclical process (Dewey, 1938; Kolb, 1984). During the experiential learning process, learners progress cyclically through four stages: concrete experience (CE), reflective observation (RO), abstract conceptualization (AC) and active experimentation (AE) (see Figure 1).

Figure 1

The Experiential Learning Cycle



Note. Learners may enter the cycle at any stage but must progress through the four steps to achieve experiential learning.

In concert, we conceptualize SAEs as a diversely implemented form of experiential learning in which growth is dependent upon implementation. Thus, the current exploration was structured to provide insights into the utilization of experiential learning within SBAE. Specifically, insights related to the diversity of teacher implementation of experiential learning through SAE programming are foregrounded. Additionally, the study will provide insights into the general efficacy of experiential learning, as implemented through SAEs. Finally, the study will provide critical insights into barriers SBAE teachers identify to implementing experiential learning in the form of SAEs.

Purpose and Objectives

The purpose of this study was to get a broader understanding of SAE perspectives from teachers in Michigan. Particular interest was taken in analyzing student growth attributed to SAEs and the diversity of ways educators conceptualize and implement SAEs. This purpose was achieved via the following objectives:

1. Identify levels of student growth teachers attribute to instruction, FFA, and SAE.
2. Compare student growth attributed to SAE between SAE implementation characteristics.
3. Identify how teachers define a successful SAE.
4. Identify barriers to SAE implementation.

Methods

Research was conducted using an online survey. Data reported are part of a larger project exploring SAEs.

Population and Response Rate

The population included all school-based agricultural educators in Michigan (N = 139) during the 2020-2021 school year. Responses were solicited from the entire population via email invitations through Qualtrics. Data were collected in May and June of 2021. In total, five emails were sent to teachers who had not completed the survey (Dillman, 2007). In total, 60 completed surveys were received (response rate = 43.17%). To evaluate non-response bias, the demographics of respondents were compared to the known demographics of Michigan teachers (Forbush et al., 2022); similarities in demographics suggested a lack of non-response bias.

Instrumentation

Development of the survey was informed by an extensive review of literature on experiential learning and SAE facilitation in agricultural education as well as the agriculture teaching experiences of survey designers. The survey was evaluated for face and content validity by a panel of experts consisting of two university faculty members and a practicing SBAE teacher with feedback incorporated into the final version.

The final version of the survey was comprised of four sections. In the first section, teachers responded to the prompt, "from your experience, how would you allocate the proportion of student growth to each component of the three-circle model?" Respondents entered numbers in three boxes corresponding to (a) classroom/laboratory instruction, (b) FFA, and (c) SAE. Importantly, responses had to summate to 100. The second section included questions evaluating teacher implementation of SAEs (e.g., do you grade SAEs, what grade level do you begin teaching about SAEs). Some questions asked teachers to indicate their agreement on a statement categorically and others presented sliding scales for teachers to indicate how much of something they were doing (i.e., how much control a student had over selecting their SAE). The third section included individual, school, and community demographic questions. The final section included open-ended questions that asked respondents to define a successful SAE and identify barriers to SAE implementation within their programs.

Data Analysis

Data were retrieved from Qualtrics and analyzed using SPSS (i.e., quantitative data) and qualitative research methods (i.e., qualitative data). For research objective one, the average and standard deviation of student growth allocation for (a) classroom/laboratory instruction, (b) FFA, and (c) SAE were calculated. For objective two, the frequency of teachers using each implementation characteristic was identified. For categorical data, average student growth allocation for SAE was compared across categories. For continuous data, a correlation between each implementation characteristic and student growth allocation was completed.

Objectives three and four utilized data gathered from open-ended questions. For objective three, respondents answered this question: "How would you describe a successful SAE?" For objective four, respondents addressed this question: "What barriers to student participation in SAEs are you aware of within your program?" A content analysis was conducted (Patton, 2002) and the approach was adapted to suit short, text-based data (e.g., Budimir et al., 2021) from survey responses. This analysis began with the lead researcher reading through the responses and conducting simultaneous open and axial coding (Merriam & Tisdell, 2016). Key words or phrases from participant responses were highlighted and compared to others to identify emergent categories (e.g., teachers using the word "time" or phrase "lack of time" were sorted into a category called "Time Constraints") of definitions of success and barriers to SAE implementation. A frequency for the number of participants who mentioned each category is reported. Importantly, while excerpts of respondents' contributions could have been coded to multiple categories, no one respondent's contributions were coded multiple times into the same category (i.e., a teacher identifying "time and money" as a barrier was represented once in the "Time Constraints" category and once in the "Financials" category). Coding was thoroughly reviewed and verified by an additional researcher and member checking was conducted.

Description of Respondents

Respondents included a predominance of traditionally certified teachers (*f* = 42; 70.00%). Additionally, most teachers taught in rural communities (*f* = 37; 61.67%) followed by suburban (*f* = 14; 23.33%) and urban (*f* = 5; 8.33%) communities. Comparing comprehensive public high schools to career centers, most respondents taught in a comprehensive public high school (*f* = 35; 58.33%). Additionally, on average, respondents had taught for 12.29 years at the time of data collection.

Results

In association with the first objective, teachers allocated percentages of student growth to (a) classroom/laboratory instruction, (b) FFA, and (c) SAE (see Table 1). The largest allocation of student growth was to classroom/laboratory instruction (*M* = 48.15, *SD* = 15.64) followed by FFA (*M* = 29.99, *SD* = 10.37) and SAE (*M* = 21.86, *SD* = 10.90).

Table 1

Student Growth Allocation

Program Component	*M*	*SD*
Classroom/Laboratory Instruction	48.15	15.64
FFA	29.99	10.37
SAE	21.86	10.90

Note. Respondent's total attribution across the three components had to equal 100. Within the responses, teachers who were at comprehensive public high schools attributed less student growth to SAEs (*M* = 20.78), than teachers at career and technical education centers (*M* = 24.35).

Transitioning to research objective two, focus shifted to differences in SAE implementation in relation to student growth attributed to SAE (see Table 2).

Table 2

Categorical Variables of SAE Implementation and Student Growth Allocation for SAE

		Growth Attributed to SAE	
Implementation Characteristic	*f*	*M*	*SD*
Grade SAEs			
Yes	26	26.43	10.35
No	27	17.15	9.80
Students Log Hours			
During Class Time	35	22.87	9.53
Outside of Class Time	15	19.33	13.35
Students Log Hours Using			
App on Phone	4	25.75	5.38
Computer or Laptop	46	21.46	11.12
Encourage All Students to have an SAE			
Strongly Disagree	0	--	--
Disagree	3	11.67	2.89
Neither Agree nor Disagree	5	18.00	10.37
Agree	27	20.05	10.78
Strongly Agree	18	26.89	10.65
Grade Level Introducing SAEs			
Seventh Grade	9	20.89	9.60
Eighth Grade	5	19.00	8.94
Ninth Grade	19	21.02	10.53
Tenth Grade	3	20.00	8.66
Eleventh Grade	16	24.25	14.04
SAE Visit Frequency			
I don’t visit students at their SAE locations	9	21.67	10.61
I visit students less than once a year	12	20.67	8.99
I visit the minority of students once per year	14	21.88	10.55
I visit the majority of students once per year	16	21.94	13.17

Note. Due to question non-response, frequencies vary from the total number of respondents.

For grading, more teachers did not grade SAEs ($f = 27$) than did ($f = 26$); however, those who graded SAEs reported higher student growth attributed to SAE ($M = 26.43$; $SD = 10.35$). Most teachers reported students logging SAE hours during class ($f = 35$), which coincided with the larger student growth attribution ($M = 22.87$; $SD = 9.53$). Students logged their hours overwhelmingly through a computer or laptop ($f = 46$); however, teachers with students logging hours through the phone app reported higher growth attribution ($M = 25.75$; $SD = 5.38$). The largest number of teachers indicated they "agree" to actively encouraging all students to have an SAE ($f = 27$); however, those who "strongly agreed" reported the highest student growth attribution ($M = 26.89$; $SD = 10.65$). Regarding introducing SAEs, the largest group of teachers first introduce SAEs to ninth grade students ($f = 19$) followed by eleventh graders ($f = 16$). Those introducing SAEs to eleventh graders reported the highest SAE growth attribution ($M = 24.25$; $SD = 14.04$). In the final categorical variable, most teachers indicated visiting the majority of students' SAE project(s) once per year ($f = 16$). This collection of teachers also reported the highest growth attribution associated with SAEs ($M = 21.94$; $SD = 13.17$).

Continuing the second research objective, we shift to the continuous variables of SAE implementation (see Table 3). On average, respondents indicated students have a high level of autonomy selecting their SAE ($M = 77.76$; $SD = 27.49$); however, student autonomy was negatively correlated to student growth allocation for SAE ($r = -.20$). Additionally, respondents indicated using an average of 20.74% ($SD = 13.18\%$) of class time on SAEs. Using class time on SAEs was positively correlated to student growth allocation ($r = .50$). Finally, respondents indicated an average of 67.66% ($SD = 32.20$) of their students had an SAE. More students having an SAE was also positively correlated to student growth allocation for SAE ($r = .47$).

Table 3

Continuous Variables of SAE Implementation and Student Growth Allocation for SAE

Implementation Characteristic	*M*	*SD*	*r*
Autonomy Students have in Selecting SAE[1]	77.76	27.49	-.20
Class Time Spent on SAEs[2]	20.74	13.18	.50
Students in Program with SAEs[3]	67.66	32.20	.47

[1]Measured from 0 (No Autonomy) to 100 (Full Autonomy); [2]Measured from 0 (0% of class time spent on SAEs) to 100 (100% of class time spent on SAEs); [3]Measured from 0 (0% of students have an SAE) to 100 (100%) of students have an SAE).

The third research objective, identifying how teachers define a successful SAE, had teachers answer the question: "How would you describe a successful SAE?" (see Table 4). The highest reported aspect of a successful SAE was being student driven ($f = 14$), where students were the ones making decisions about what they wanted to do with minimal support from outsiders. The second aspect was developing skills ($f = 13$), where an SAE would allow a student to acquire more hard or soft skills. The third aspect was that an SAE was engaging to the student ($f = 11$), where a student was able to explore their interests, enjoyment of, or passion for their project or field. The fourth aspect was that an SAE was goal oriented ($f = 9$), demonstrating that students had a plan and desired outcomes from their project. The fifth aspect, career exploration ($f = 5$), placed importance on students having a job, exploring career options, or students working on something that could lead to a future career. Those indicating a successful SAE required the application of knowledge ($f = 4$) believed SAEs ought to allow students to use the knowledge they learned in the classroom in a different context or develop further knowledge to take with them into their later education or career. Finally, recordkeeping (*f* = 4) was indicated as something that relates to having a successful SAE.

Table 4

Frequency of Themes When Defining a Successful SAE

Code	*f*	Representative Quote
Student Driven	14	"Directed/planned by students"
Developing Skills	13	"Helping students gain skills and habits to use later in life"
Engaging to Student	11	"Student should be passionate and excited to develop and carry out the SAE"
Goal Oriented	9	"Explicit connections between the SAE and learning targets"
Career Exploration	5	"Progressively increases the student's knowledge of their career options"
Application of Knowledge	4	"Applied and transferred into a post-secondary education or career"
Recordkeeping	4	"Documented it has proof with pictures and receipts"

Note. Total number of respondents for this open-ended question was 37.

The fourth research objective, identifying barriers to SAE implementation, had teachers answer the question: "What barriers to student participation in SAEs are you aware of within your program?" (see Table 5). The greatest perceived barrier to SAE implementation was time (*f* = 18), largely relating to students having other engagements that require their time along with a perceived lack of time in the classroom. The next largest perceived barrier was financials (*f* = 16), which impact students' ability to fully engage in an SAE. Next is transportation (*f* = 11), wherein students simply cannot get themselves to another site or even back to their school to participate in SAE activities. Following that is student motivation (*f* = 10), with teachers detailing that students do not "make SAE a priority" or "[do not] want to have an SAE." Student support (*f* = 9) was also a concern for teachers, stemming from a variety of parties; lack of parent or family support was the most prevalent, followed by an unsupportive community and administration. Space was indicated as a barrier (*f* = 8), including geographical area and limited space to facilitate SAE opportunities for students. The next barriers were reported less frequently: teacher self-efficacy (*f* = 4) and student age (*f* = 3). Teacher self-efficacy related to the perceived need for "mentoring/coaching from [a] more experienced teacher" and a lack of comfort with AET and SAEs that made it hard to "encourage students to participate." Another aspect of self-efficacy with SAE implementation that was a problem was recordkeeping, with one teacher having issues with students being "very intimidated" to log hours into AET and another who found it hard to get students to log their hours. Student age was an issue in some areas, as many places would not hire students until they were 18.

Table 5

Frequency of Themes When Identifying Barriers to SAE Implementation

Code	*f*	Representative Quote
Time Constraints	17	"Time. Kids are committed to everything today."
Financials	16	"Money. If a kid has a choice between a paying job and an SAE that pays less, in my low income community, it comes down to who pays more every single time."
Transportation	11	"Ability to travel."
Student Motivation	11	"Student interest in SAEs/motivation to complete work outside of class."
Student Support	9	"Lack family support at home."
Space	8	"Geography (city limits)"
Awareness	8	"Students have no history or familiarity with FFA, so work on an individual project outside the classroom is a foreign concept."
Teacher Self-Efficacy	4	"I am not comfortable with AET or SAE's enough myself to encourage students to participate."
Student Age	3	"Some sites will not take students under 18 years old."

Note. Total number of respondents for this open-ended question was 39.

Discussion, Recommendations, and Conclusions

As a method of experiential learning (Baker et al., 2012; Lewis et al., 2012), SAEs provide a tremendous opportunity to foster student growth. However, just as all experiences fail to yield the same level of learning, variation in SAE implementation may influence student growth. In this study, student growth and SAE implementation were foregrounded to illuminate the *why* and *how* of SAE facilitation. Before exploring the major conclusions, two limitations are introduced. First, data collected are limited to the respondents within a single state; therefore, caution should be used when translating findings to other contexts. Second, growth attribution was measured as if classroom/laboratory instruction, FFA, and SAE were distinct programmatic elements to reduce respondent burden; however, the three-circle model details overlap between these components.

In this study, 'growth' was not defined for survey respondents; this was a deliberate choice made because placing limitations on what teachers define as 'growth' could eliminate aspects of growth observed and reported. For example, students who are unwilling to speak in class who grow into a confident public speaker would not be counted as someone who grew in their technical skills, and someone who developed a variety of technical skills through their SAE may not have developed many skills in public speaking. Therefore, we recommend future research use the growth attribution model to measure perceived student growth in different categorical areas, such as self-efficacy, leadership skills, communication skills, or technical skills, to see what each of the three circles are developing for students. Additionally, we recommend research gathering student perspectives on the growth they experience across the three circles.

Comparing respondent growth attribution scores within the current study suggests approximately half of student growth emerging from SBAE is attributed to classroom/laboratory instruction ($M = 48.15$). The remaining half of growth attribution is split, with FFA taking a larger proportion ($M = 29.99$) than SAE ($M = 21.86$). Certainly, each element of the SBAE program is important (Croom, 2008); however, these data suggest an opportunity to expand SAE to account for more growth. The *SAE for All* initiative is an exciting development that may help to increase the student growth attributed to SAE; therefore, stakeholders are encouraged to support teacher implementation of *SAE for All* via volunteer opportunities, resources, and professional development. In addition, continued research utilizing the growth attribution method is warranted to evaluate changes related to initiatives like *SAE for All*.

Regarding SAE implementation, there was a discrepancy between how teachers at CTE centers ($M = 24.35$) and teachers at comprehensive public high schools ($M = 20.78$) attributed growth to SAEs. This appears to correspond with the grade level at which teachers introduce SAEs to students, as teachers introducing SAEs to eleventh grade students reported greater growth attribution to SAEs ($M = 24.25$) than teachers who introduced SAEs to ninth grade students ($M = 21.02$). Teachers at CTE centers attributed more growth to SAEs, and these teachers generally introduce eleventh grade students to SAEs, because that is the first year students can enroll in most CTE centers. The larger SAE-related growth observed in CTE centers may in part be due to the accessibility of transportation for CTE center students; most students who attend CTE centers are above the age of 16 and may have their license, allowing them to expand their SAE opportunities. Additionally, those who are 16 may have more access to employment. Students enrolled in comprehensive public high schools may have a wider age distribution as well, so some SAEs may be out of reach without support and/or resources from other parties (i.e., familial, teacher, peer, etc.). As many teachers reported transportation as a barrier to SAE access ($f = 11$), it may be valuable to see how this access changes in different contexts. Another factor that CTE centers have in their favor is time; CTE centers generally have students for longer class periods, potentially allowing teachers to spend more time on SAEs. As time constraints were the most frequently identified barrier to SAEs ($f = 17$), having more class time available may allow for more impactful SAE implementation. There may be yet another student factor playing into this as well; generally speaking, students who elect to attend a SBAE course at a CTE center may already know of their interest in pursuing an agricultural career and thus be more intrinsically motivated to make the most out of their SAEs.

A finding from research objective two demonstrated there was not much difference between the frequency of SAE visits (teachers with no visits: $M = 21.67$; teachers who visit the majority of students once a year: $M = 21.94$) and overall teacher growth attribution to SAEs ($M = 21.86$). Part of the similarity between these numbers could be driven by the CTE center teachers due to the nature of CTE centers. CTE teachers would need to travel greater distances to see their students from varying sending schools and that may not be as feasible as a teacher who works at a comprehensive public high school getting out to visit their students. The efficacy of SAE visits may be a topic of interest for researchers, as identifying how to optimize student growth from these visits could be important for justifying visits to administrators and receiving compensation for that work. On the other hand, SAE visits may be thought to have more of a social-emotional purpose for students, as visiting these SAE sites may provide the opportunity for a student to witness their teacher being willing to see their opportunities firsthand. Understanding the purpose of an SAE visit may be important, especially with the implementation of *SAE for All*.

In objective three, teachers characterized quality SAEs in a multiplicity of ways. Definitions provided by teachers are largely in line with the definition provided by The National Council for Agricultural Education (2021). Teachers' definitions prioritize opportunities that are student driven ($f =$

14), develop student skills (*f* = 13), and are engaging to the student (*f* = 11). These qualities of successful SAEs appear to align with the findings of Haddad and Marx (2018), demonstrating that SAE growth is dependent on the level of student investment in their SAE. Additionally, the definition of SAE and SAE categories have shifted over time and this was shown to have affected teacher perceptions of SAEs (Wilson & Moore, 2007); and with *SAE for All* there may still be issues teachers face for implementing this programming.

Regarding addressing barriers to SAEs, it is important to consider what has already been proposed in the plan for *SAE for All*. This initiative has taken many of these barriers into consideration, including the multi-faceted, largely individualized issue of student motivation. By approaching SAE instruction from a student benefit angle, student motivation may be positively impacted (The National Council for Agricultural Education, 2021). Future studies could choose to focus on student perspectives of SAEs to analyze what aspects of their SAE they perceive to be the most beneficial and worthwhile. Another barrier to implementation identified was financials; financial concerns are also taken into consideration by the National FFA in the form of SAE grants, so there may be something prohibiting students from accessing funds available to them. Research investigating perceived barriers between grant access and students with SAEs could help to create resources for teachers that would allow greater access to funding. Giving attention to barriers to SAE implementation is important for SAEs to remain an impactful, meaningful aspect of SBAE; to have thriving SAE programming, there must be effective ways to deal with these barriers. Many of these identified barriers have been highlighted by teachers in the past (Doss & Rayfield, 2019; Wilson & Moore, 2007) and are still relevant today.

Recommendations for SAE Implementation

The results of this study illuminate SAE implementation methods corresponding to increased SAE attribution scores. For stakeholders seeking to increase student growth emanating from SAE, these implementation methods should be considered. Specifically, it is recommended that (a) SAEs be graded, (b) increased class time be spent discussing SAEs, including logging SAE experiences during class hours, (c) SAE experiences be logged using student phones, (d) all students be encouraged to pursue an SAE, and (e) students should not be given full autonomy when selecting an SAE.

It is important, however, to consider the ideal amount of student autonomy when selecting an SAE. A paradox seems to exist between student driven SAEs being perceived as the most successful qualitatively (*f* = 14), despite quantitative data showing a negative correlation between full student autonomy and student growth attributed to SAEs ($r = -.20$). Importantly, disallowing students from having a choice would affect student buy-in; if students perceive their SAE as something their teacher thought could be good for them alone, they may not be willing to get involved. On the flipside, a student who selects their SAE may have full buy-in, but they may select an option that is easy for them instead of something that would have the most impact. Therefore, there is likely an ideal level of student autonomy in selecting SAEs where the teacher provides some guidance to students who make a decision that is both their own and provides the maximum impact on the students' development.

As this research highlights, SAE implementation is varied, and those variations likely influence student growth emanating from this component of SBAE. To maximize the potential experiential learning opportunities provided via SAEs (Baker et al., 2012; Lewis et al., 2012), it is important to understand how SAEs are best implemented to facilitate those growth opportunities for students. Continued scholarship on the efficacy of diverse SAE approaches is essential to capitalize on the learning potential of SAEs for *all students*.

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