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Professional Rededication to SAE: Describing SAE Implementation in the United States

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Abstract

The 'home project' concept, now known as a Supervised Agricultural Experience (SAE), has been a cornerstone of School-Based Agricultural Education (SBAE) for 100+ years. This experiential element of SBAE provides students with authentic and relevant experiences to enhance the learning process. While agricultural educators throughout the U.S. agree that SAE is an essential aspect of agricultural education, many educators claim they are not confident in implementing SAE into professional practice. This lack of confidence from educators has caused SAE to decline to the point of professional concern. This study aimed to describe SAE implementation nationally. Data utilized in this study was collected from the Agricultural Experience Tracker (AET) through student and teacher entries. Data represents entries from 619,077 students in 4,820 SBAE programs in 45 states. It was determined that the states utilizing the AET for record-keeping the most were Oklahoma (94%), Montana (94%), and Colorado (92%). Additionally, data suggested that 52.3% of SBAE students have an SAE, and the most common SAE types are within the Animal Science, Plant Science, and Power, Structural, and Technical Systems pathways. Furthermore, an estimated 865,245 SAEs nationally account for approximately $558 million in income and $857 million in investments. Overall, this suggests that the average SAE is unprofitable, which is not uncommon for new agricultural enterprises. The vast scope of SAE should be shared with agricultural education stakeholders, including educators, state staff, political leaders, educational administrators, etc., to communicate the impact of work-based learning and SAE in SBAE.

Introduction and Review of Literature

Rufus Stimson and his vision for the 'Home Project'

Rufus Stimson (1919), an early 20th-century agricultural educator, published his book entitled *Vocational Agricultural Education by Home Projects*. Many agricultural education historians credit Stimson for creating the concept of the 'home project', along with other early agricultural educators such as William H. Kilpatrick (Roberts & Harlin, 2007). Stimson was president of the Connecticut Agricultural College and became deeply concerned about how agriculture was taught at the secondary and post-secondary levels (Moore, 1988; Smith & Rayfield, 2016). During this time, Stimson postulated the project method and, in 1908, accepted a position as the Director of the Smith's Secondary Agricultural School in Massachusetts

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(Moore, 1988; Smith & Rayfield, 2016). This new position allowed him to test the project method and evaluate its effectiveness (Moore, 1988; Smith & Rayfield, 2016). The success of the project method at Smith's Secondary Agricultural School would resonate throughout the profession for 100+ years (Moore, 1988; Smith & Rayfield, 2016).

Evolution of the 'Home Project'

The concept of the 'home project', now known as a Supervised Agricultural Experience (SAE), brings an experiential nature to agricultural education, allowing students to practice instruction received through their course(s) and FFA involvement (Dyer & Osbourne, 1995; Moore, 1988; Rank & Retallick, 2016; Smith & Rayfield, 2016). Stimson originally encouraged his students to develop a project to "experience" the content taught in his courses (Dyer & Osbourne, 1995). The concept of SAE is based on the educational philosophies of John Dewey (Dyer & Osbourne, 1995; Roberts & Harlin, 2007), who purported that as relevant experiences are incorporated into instruction, the learning process will become more engaging and efficient (Dewey, 1938). Knobloch (2003) suggested that the components of school-based agricultural education (SBAE) are interwoven within the tenets of experiential instruction and that the teachings of Dewey, Stimson, and others are integral to SBAE's mission. This uniquely positions agricultural educators to provide authentic experiences to students through SAE and, therefore, elevate the level of instruction received by SBAE students (Roberts & Harlin, 2007; Smith & Rayfield, 2016; Wilson & Moore, 2007). It should be noted that the concept of SAE would later be incorporated into the modern three-component model as a cornerstone of agricultural education (Croom, 2008).

Historical Decline of SAE Implementation

When the Smith-Hughes *National Vocational Education Act of 1917* was signed into law by President Woodrow Wilson, the inclusion of an SAE was solidified as a requirement for all agricultural education students (Dyer & Osbourne, 1995). The act stated that "education in agriculture of less than college grade" (National Vocational Education Act, 1917, p. 934) should require a "…directed or supervised practice in agriculture, either on a farm provided by the school or other farm, for at least six months per year" (National Vocational Education Act, 1917, p. 934). Including a supervised experience in this seminal legislation solidified the concept of SAE as a critical component of agricultural education (Dyer & Osbourne, 1995; Moore, 1988; Rank & Retallick, 2016; Roberts & Harlin, 2007; Rubenstein et al., 2023; Smith & Rayfield, 2016; Wilson & Moore, 2007). Until the *National Vocational Education Act of 1963*, federal legislation would not significantly affect the implementation of SAE (Phipps & Osbourne, 1988). Many agricultural education professionals consider the federal legislation passed in 1963 as a pivotal point in the decline of supervised experiences (Phipps & Osbourne, 1988; Smith & Rayfield, 2016). The popularity of SAE increased throughout the first half of the 20th century (Smith & Rayfield, 2016). This expansion of SAE would be halted by the Vocational Education Act of 1963, which stated that agricultural education "…may be provided without directed or supervised practice on a farm" (National Vocational Education Act, 1963, p. 559). This verbiage was included in the legislation to broaden the scope of SAE (Roberts & Harlin, 2007; Smith & Rayfield, 2016; Wilson & Moore, 2007). Unfortunately, many SBAE stakeholders interpreted this as the removal of required supervised projects (Smith & Rayfield, 2016) Throughout the last half of the 20th century, the decline in SAE implementation would reach professional alarm (Miller, 1980; Wilson & Moore, 2007).

Impact of SAE

Since Stimson's envisioning of the SAE concept, agricultural education students have been impacted by this experiential project method (Hanagriff et al., 2010; Hanagriff et al., 2014; Haddad & Marx, 2018; Ramsey & Edwards, 2011; Ramsey & Edwards, 2012). Ramsey and Edwards (2011) found that employers expected students to learn skills that were useful to the agricultural industry. Haddad and Marx

(2018) determined that students gained valuable employability skills through SAE that were helpful to their future career choices. In addition to skill acquisition, SAEs contributed a significant amount of economic impact to local, state, and national economies (Hanagriff et al., 2010; Hanagriff et al., 2014). Hanagriff et al. (2010) determined that SAEs had approximately $103 million in direct spending and $189 million in economic impact in Texas. Furthermore, Hanagriff et al. (2014) determined that agricultural mechanics projects produced around $10 million in economic impact in Texas.

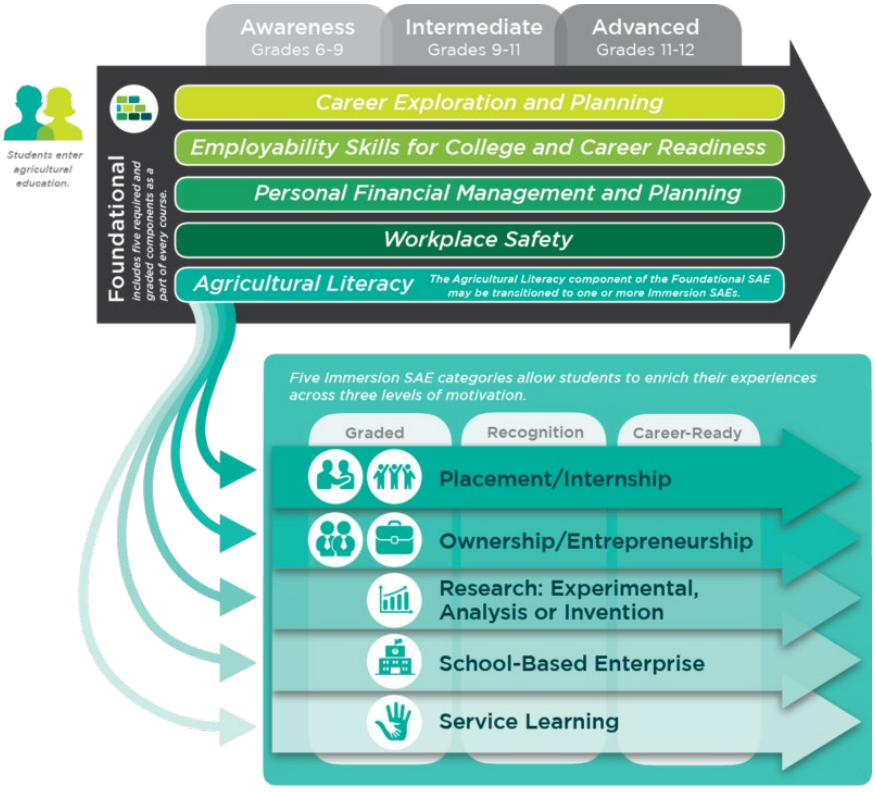
Professional Rededication to SAE

The National FFA Organization and the National Council for Agricultural Education (NCAE) have led the charge to increase SAE implementation (NCAE, 2024). In the early 1990s, the NCAE issued a handbook entitled *SAE: Experiencing Agriculture* and released the *Decisions and Dollars* curriculum (Wilson & Moore, 2007). The National FFA Organization expanded the SAE awards program significantly with new proficiency award categories, the expansion of the Stars over America awards, and the adoption of new accounting principles for SAE record-keeping (Wilson & Moore, 2007). These changes modernized SAE-based awards and SAE record keeping, which reestablished its importance in SBAE (Wilson & Moore, 2007).

While SAE implementation has declined since the mid-20th century (Smith & Rayfield, 2016), the profession has taken steps over the last two decades to increase participation (NCAE, 2024). In 2019, the NCAE and the National FFA Organization unveiled a novel SAE model called 'SAE for All' (NCAE, 2024; see Figure 1).

Figure 1

Framework Depicting the 'SAE For All' Model



Note. Framework was developed by the NCAE (2024).

This model onboards new SBAE students to the SAE process through a foundational project (NCAE, 2024). This foundational project consists of five elements, including 1) career exploration and planning, 2) employability skills for college and career readiness, 3) personal financial management and planning, 4) workplace safety, and 5) agricultural literacy (NCAE, 2024). This beginning stage project allows new SBAE students to explore agriculture and develop plans for long-term SAE engagement (NCAE, 2024). The expectation is that students will transition from a foundation project to an immersion SAE as they continue their experience in agricultural education (NCAE, 2024). Immersion projects consist of five types of SAEs, including 1) Entrepreneurship, 2) Placement, 3) Research/Experimental, 4) School-based enterprise, and 5) Service learning (NCAE, 2024). This novel SAE model will assist the profession in engaging in quality SAE implementation nationally. Additionally, the 'SAE for All' model will encourage the SBAE profession to broaden SAE opportunities for all students (NCAE, 2024), which will support employability skill development for a larger audience (Ramsey & Edwards, 2011; Ramsey & Edwards, 2012).

The introduction of the Agricultural Experience Tracker (AET) has revolutionized how agricultural educators teach SAE record-keeping (Price et al., 2023). The AET is a privately-owned company that operates an electronic accounting system specializing in SBAE student project records (AET, 2024). Traditionally, SAE records were stored in a paper record book (Bird et al., 2013; Moore, 1988; Smith & Rayfield, 2016; Wilson & Moore, 2007). As modern society has become increasingly more digital, electronic record books have become more popular, with approximately 78% of SBAE programs utilizing the AET (Hanagriff, 2023). While the AET is utilized by agricultural education programs nationwide, many educators acknowledge being uncertain in their abilities to utilize the system effectively (Ferand et al., 2020; Price et al., 2023; Sorensen et al., 2014; Toombs et al., 2022).

Modern Perceptions of SAE

Overall, agricultural educators agreed that SAEs are a critical aspect of agricultural education and that they are beneficial to students (Blackburn & Ramsey, 2014; Dyer & Williams, 1997; Rubenstein & Scott, 2021; Shoulders & Toland, 2017; Wilson & Moore, 2007). Johnson et al. (2012) found that agricultural educators in North Carolina agreed that SAEs help students with special needs develop career goals and social skills. While educators agreed that SAE was critical for student success (Blackburn & Ramsey, 2014; Rubenstein & Scott, 2021; Shoulders & Toland, 2017), many educators claimed they were not confident in their ability to implement SAE into professional practice (Doss & Rayfield, 2019). This lack of confidence in implementing SAE caused some educators to spend less time focusing on supervised projects (Lewis et al., 2012; Shoulders & Toland, 2017). Lewis et al. (2012) determined that agricultural educators spent 9 to 34 days of instructional time on SAE, and Shoulders and Toland (2017) suggested that SAE was the least emphasized area of SBAE's three-component model. Rubenstein and Thoron (2015) purported that the main factor determining the quality of SAE implementation was the knowledge and dedication of the educator, which is contrasted with only 53% of undergraduate teacher preparation programs offering specific coursework in SAE implementation (Rank & Retallick, 2017).

While SAE has a historical past as a cornerstone of agricultural education (Croom, 2008), very little is known about the current state of SAE implementation. Croom (2008) stated that "for the [agricultural education] model to be successful to a significant degree, there must be a commitment by all stakeholders to deliver all components collectively" (p. 118). As the profession rededicates itself to SAE, more information on how SAE is implemented nationally will become critical to evaluating engagement efforts.

Theoretical Framework

Kolb's Experiential Learning Theory (ELT) guided this study's theoretical focus (Kolb, 1984). This theory's foundation is that as authentic experiences are incorporated into the instructional process, the engagement of the student increases, and the learning process becomes more efficient (Dewey, 1938; Kolb, 1984). Furthermore, this theory purports that students must actively engage in the instructional process and take ownership of their learning for it to be efficient (Dewey, 1938; Kolb, 1984). The ELT is based on six central principles that guide the theory (Kolb, 1984):

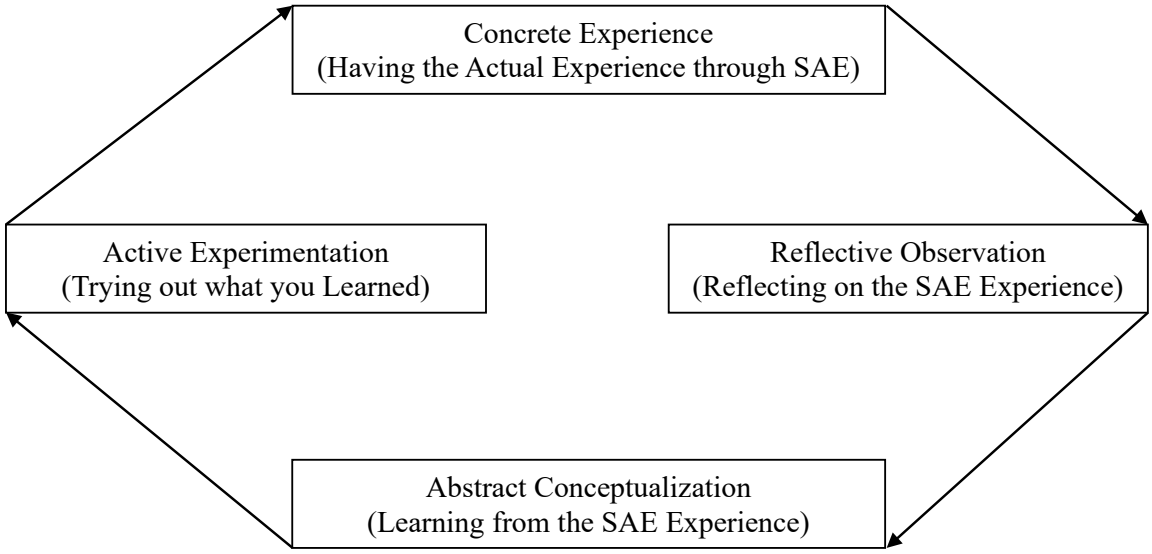
1.) Learning is best conceived as a process, not in terms of outcomes.
2.) Learning is a continuous process grounded in experience.
3.) The process of learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world.
4.) Learning is a holistic process of adaptation to the world,
5.) Learning involves transactions between the person and the environment.
6.) Learning is the process of creating knowledge.

Baker et al. (2012) suggested that "…[Kolb's] experiential learning model, when placed on the agricultural education model, illustrates the total learning experience of agricultural education" (p. 6). This learning model has been utilized in agricultural education since its inception through the implementation of SAE. Baker et al. (2012) stated "Agricultural education is uniquely poised to help students through an effective model of instruction that is experiential by nature" (p. 12). This utilization of the ELT in agricultural education allows educators to improve their pedagogical tactics and reinforce content with relevant experiences to improve the learning process for students (Baker et al., 2012).

Roberts (2006) describes how concrete experiences are at the pinnacle of learning. Dewey (1938) suggested that all learning is experiential, but not all experiences are educational (Coleman et al., 2024; Roberts, 2006). The experiential nature of SAE establishes it as an effective vessel for developing agricultural skills and knowledge (Baker et al., 2012; Coleman et al., 2024; Roberts, 2006). Doss and Rayfield (2019) determined that many educators were not confident in their abilities to implement SAE as an instructional tool, which reduced SAE implementation, making it not available to all SBAE students (Lewis et al., 2012; Shoulders and Toland, 2017). Operationalizing the 'SAE for All' model will assist in broadening the scope of SAE to more SBAE students (NCAE, 2024) and further its impact on skill development through authentic and concrete experiences (Ramsey & Edwards, 2011; Ramsey & Edwards, 2012). The interaction between the ELT and SAE is depicted in Figure 2.

Figure 2

Theoretical Framework for Kolb's Theory of Experiential Learning in SAE



Note. Developed from Kolb's Model of Experiential Learning

Purpose of the Study

The purpose of this study was to describe SAE implementation nationally by examining SAE records reported through the AET. These records were then extrapolated to determine estimates of SAE implementation nationally. The results of this study have significant implications for determining the quality and quantity of SAE implementation. Furthermore, this study can help inform the profession on the health of SAE engagement. The following research objective guided the study:

1. Describe SAE implementation in SBAE nationally.

Methods

Participants

The population of this study included SBAE programs in the U.S. that utilize the AET as a record-keeping system for student's supervised projects. This study utilized averages per program to extrapolate national estimates on various SAE and AET metrics. The researchers had difficulty determining an accurate and conservative estimate of the quantity of SBAE programs nationally. The National FFA Organization reported 8,817 FFA chapters in the 2020-2021 academic year (FFA, 2023). The researchers were hesitant to utilize this number for national estimates because the number of FFA chapters is not necessarily equivalent to the quantity of SBAE programs nationally. The National Agricultural Education Supply and Demand Study from Smith et al. (2019) reported 9,071 SBAE programs nationally for 2018, but Foster et al. (2021) reported 8,466 nationally in 2020. Ultimately, the researchers chose to average the estimates from the 2018-2020 National Agricultural Education Supply and Demand Studies to determine a conservative estimate of SBAE programs in the U.S. (see Table 1). While there are some known inaccuracies in the National Agricultural Education Supply and Demand report due to some states not reporting data, the response rates for states were between 89% and 98% (Smith et al., 2019; Foster et al., 2020; Foster et al., 2021), which was deemed acceptable by the researchers.

Table 1

Average Number of SBAE Programs Nationally

Citation	# of SBAE Programs Nationally
Smith et al., 2019	9,071
Foster et al., 2020	8,504
Foster et al., 2021	8,466
Average	≈ 8,690

Note. Figures Based on National Estimates in the National Agricultural Education Supply and Demand Studies.

The researchers estimated there to be 8,690 SBAE programs nationwide. Overall, 6,752 agricultural education programs utilized the AET system, which equated to approximately 78% of programs (Hanagriff, 2023). The researchers excluded 1,982 programs from this analysis because they utilized the AET system for FFA award applications but did not have SAE records recorded in the AET. This provided a sample from 619,077 students in 4,820 SBAE programs in 45 states. The data from these programs and states were selected because they utilized AET for student SAE records. Overall, this sample represents 55.4% of the SBAE programs nationally.

Data Collection and Analysis

Data analyzed in the study were collected through the AET from teacher and student entries during the 2022 calendar year. Data in this study were analyzed using central tendencies and percentages to derive average values per SBAE program and national estimates of SAE engagement.

Limitations

This study describes SAE implementation from the 4,820 SBAE programs reporting data through the AET during the 2022 calendar year. This data collection method limits the study because it is possible that the programs utilizing this system have more supervised student projects than SBAE programs not utilizing the AET. Additionally, the researchers estimate there to be 8,690 SBAE programs nationwide. Overall, the researchers agreed that this is a conservative estimate, but any variation in this amount could alter the national estimates presented in the study.

Results

AET records were analyzed to determine usage by program and state. It was determined that 55.4% of SBAE programs utilized the AET for student project records. Rankings of states by percentage of use determined states who most utilized the program (see Table 2).

Table 2

Percentage of Agricultural Education Programs Utilizing the AET Record System by State

Rank #1 - 17	%	Rank #18 - 34	%	Rank #35 - 51	%
1. Oklahoma	94%	19. W Virginia	71%	36. Missouri	33%
2. Montana	94%	20. Alabama	71%	37. Mississippi	33%
3. Colorado	92%	21. Kentucky	68%	38. S Carolina	31%
4. Idaho	90%	22. Iowa	66%	39. Indiana	30%
5. Nevada	89%	23. California	62%	40. Rhode Island	25%
6. Nebraska	87%	24. Texas	62%	41. Louisiana	25%
7. N Dakota	87%	25. Illinois	62%	42. Virginia	24%
8. Wyoming	86%	26. Kansas	58%	43. Georgia	23%
9. Ohio	82%	27. S Dakota	54%	44. Tennessee	20%
10. Connecticut	81%	28. Maryland	53%	45. Wisconsin	19%
11. Oregon	80%	29. N Mexico	52%	46. Hawaii	14%
12. Utah	79%	30. Minnesota	51%	47. Florida	11%
13. Arizona	78%	31. New Jersey	50%	48. Massachusetts	6%
14. Michigan	78%	32. Delaware	45%	49. Vermont	N/A
15. N Carolina	75%	33. New York	42%	50. Maine	N/A
16. Arkansas	73%	34. Washington	40%	51. Virgin Islands	N/A
17. Pennsylvania	72%	35. Alaska	33%	52. Puerto Rico	N/A

Note. $n = 4{,}820$

The quantity of SBAE programs utilizing AET ranged substantially with 94% of SBAE programs in Oklahoma, 94% in Montana, 92% in Colorado, and 90% in Idaho utilizing the AET for student project records. Additionally, some states and territories had less than 10% of their SBAE programs utilizing the AET, with only 6% of programs in Massachusetts, 0% in Vermont, 0% in Maine, 0% in Puerto Rico, and 0% in the Virgin Islands.

SBAE programs that utilized the AET averaged 5,832.2 journaled hours per program for the 2022 calendar year. This included 4,662.8 SAE hours, 899.7 FFA hours, and 260.7 community service hours. The FFA and community service journal hours were included due to their relevance to competitive SAE-based award applications (i.e.. proficiency awards, state degree, etc.) offered through the FFA. Overall, it is estimated that SBAE programs spent 50,603,336 hours collectively on SAE, FFA, and community service. These descriptive statistics are reported in further detail in Table 3.

Table 3

Hours Journaled Through the Agricultural Experience Tracker

Descriptive Area	Average Per Program	%	National Estimate ($N = 8{,}690$ Programs)
SAE Journal Hours	4662.8	80.0%	40,519,649
FFA Journal Hours	899.7	15.5%	7,818,494
Community Service Journal Hours	260.7	4.5%	2,265,193
Total Hours	5,823.2	100%	50,603,336

Note. $n = 4{,}820$. Averages per program have been rounded to the nearest decimal place. National estimates are based on unrounded per program averages to reduce rounding errors.

The average number of teachers per program was 1.92, and 128 students were active on the AET. Additionally, 67 students (52.3%) per SBAE program had an SAE, and 66.4% of students had active journals in the AET (see Table 4).

Table 4

Descriptive Statistics for Average Program in the United States

Program Demographics	2022 Averages Per Program
Number of Teachers	1.92
Active Students (All Grades)	128
% of Students with SAEs (Active)	52.3
% of Students with Journals (Active)	66.4

Note. n = 4,820

Overall, there was an average of 100 SAEs per SBAE program among the 67 students participating, with several students having multiple projects. Of these 100 projects, 28 were foundational SAEs, and 72 were Immersion SAEs. Within the Immersion SAE category, 26 of them were entrepreneurship, 39 were placement, and 7 were research SAEs. This estimates to 865,245 SAE projects nationally (see Table 5).

Table 5

Student SAE Involvement Per-Program by Primary SAE Type

SAE Descriptive Area	# of SAEs Per Program	%	National Estimates (N = 8,690 Programs)
Total Foundational SAEs	28		243,744
Total Immersion SAEs	72		621,501
Entrepreneurship SAEs	26	35.9	222,895
Placement SAEs	39	54.1	336,094
Research SAEs	7	10.0	62,512
Total SAEs Per Program	100	100.0	**865,245**

Note. n = 4,820. Averages per program have been rounded to the nearest whole figure. National estimates are based on unrounded per program averages to reduce rounding errors.

Of the 100 SAEs in the average agricultural education program utilizing the AET in the 2022 calendar year, approximately 35.0% were within the animal science pathway, 16.6% in the plant science pathway, and 8.0% in the power, structural, and technical systems pathway. The pathways with the least amount of SAEs on average included 0.2% in the Biotechnology pathway, 1.8% in the Natural Resources pathway, 1.8% in the Environmental Science pathways, and 1.8% in the Leadership Education and Communications pathways (see Table 6).

Table 6

Average Quantity of SAEs per Program by Pathway

SAE AFNR Area	Average # Per Program	% of SAEs per Program
Animal Science	35.0	35.0
Agribusiness Systems	4.5	4.5
Leadership Education & Comm.	1.8	1.8
Environmental Systems	1.8	1.8
Food Products and Processing	4.9	4.9
Power, Structural, and Technical	8.0	8.0
Natural Resources	1.8	1.8
Plant Science	16.6	16.6
Biotechnology	0.2	0.2
Other/Not Reported	25.4	25.4

Note. n = 4,820

The average annual income from SAEs per SBAE program totaled approximately $64,212. The largest areas of income from supervised projects included $36,325 in Paid Work Income, $8,119 in Awards/Scholarships/Premiums, and $7,435 in Stock Show Sales. Overall, the researchers estimated there to be $558 million in annual income from SAE projects nationally (see Table 7).

Table 7

Income Values from SAE Engagement in Agricultural Education Programs

Area of SAE Income	Average Per Program	%	National Estimate (N = 8,690 Programs)
Paid Work Income	$36,325	56.6	$315,661,125
Awards/Scholarships/Premiums	$8,119	12.6	$70,552,060
Stock Show Sale	$7,435	11.6	$64,610,256
SAE Labor Exchange	$6,406	10.0	$55,668,116
Used at Home	$2,153	3.4	$18,705,814
Cash/Market Sale	$1,677	2.6	$14,573,668
Rental Income	$1,294	2.0	$11,248,350
Research Funding	$803	1.3	$6,980,241
Total Value	**$64,212**	100.0	**$557,999,629**

Note. n = 4,820. Averages per program have been rounded to the nearest whole figure. National estimates are based on unrounded per program averages to reduce rounding errors.

In many cases where students earned an income from their SAEs, the students must invest financial resources into the project. These operating expenses are often associated with entrepreneurship and research projects. These operating expenses for student projects are detailed in Table 8.

Table 8

SAE Investments in Operating Expenses

Expenditure Area	Average Per Program	%	National Estimate (*N* = 8,690 Programs)
Inventory for Resale	$23,875	32.6	$207,470,908
Feed	$13,015	17.8	$113,096,652
Other Expenses	$6,756	9.2	$58,711,261
Rent	$5,514	7.5	$47,913,612
Fertilizer/Chemicals	$5,500	7.5	$47,797,091
Contract/Custom Hire	$4,563	6.2	$39,648,549
Supplies	$3,154	4.3	$27,409,956
Seed	$2,719	3.7	$23,630,781
Repairs/Maintenance	$1,948	2.7	$16,929,098
Paid Work Expense	$1,877	2.6	$16,308,011
Fuel	$1,530	2.1	$13,297,698
Veterinary Medicine	$1,364	1.9	$11,854,754
Entry Fees/Commissions	$1,344	1.8	$11,675,443
Total Value	**$73,158**	100.0	**$635,743,814**

Note. n = 4,820. Averages per program have been rounded to the nearest whole figure. National estimates are based on unrounded per program averages to reduce rounding errors.

Overall, the average SBAE program had students investing $73,158 in current operating expenses. This excluded non-current (long-term) investments such as breeding animals, land, equipment, etc. The largest areas of investment included $23,875 in Inventory for Resale, $13,015 in feed, $6,756 in other expenses, and $5,514 in rent. The national investments in operating expenses for supervised projects are estimated at $635 million for 2022 (see Table 8).

The average investment for non-current (long-term) items per SBAE program in 2022 totaled $25,514. When non-current item investing is combined with the $73,158 invested in operating expenses (see Table 8), the total investments per SBAE program calculates to $98,672. Overall, the national estimate of SAE spending totaled $857 million nationally (see Table 9).

Table 9

Direct Investments and Economic Impact Values from SAE Engagement

Area of Economic Activities (SAE Investments)	Average Program Value Direct Spending (Per Program)	National Estimate (N = 8,690 Programs)
Total Operating SAE Expenses	$73,158	$635,743,814
Non-Current Asset Purchases	$25,514	$221,716,660
Total Value	**$98,672**	**$857,460,474**

Note. *n* = 4,820. Averages per program have been rounded to the nearest whole figure. National estimates are based on unrounded per program averages to reduce rounding errors.

Conclusions and Implications

The concept of SAE has been a cornerstone aspect of agricultural education since Rufus Stimson first envisioned the project method (Dyer & Osbourne, 1995; Moore, 1988; Rank & Retallick, 2016; Smith & Rayfield, 2016). This experiential component of SBAE provides students with authentic and relevant experiences to engage them in the instructional process (Baker et al., 2012). While agricultural educators agree that SAE is a critical component of agricultural education (Blackburn & Ramsey, 2014; Dyer & Williams, 1997; Johnson et al., 2012; Rubenstein & Scott, 2021; Shoulders & Toland, 2017; Wilson & Moore, 2007), Shoulders and Toland (2017) determined that SAE is the least emphasized area of SBAE. Additionally, many agricultural educators do not feel confident implementing SAE into instructional practice (Doss & Rayfield, 2019), and only 53% of undergraduate teacher preparation programs have coursework dedicated to SAE implementation (Rank & Retallick, 2017). This lack of confidence displays itself with only 52.3% of SBAE students engaged in SAE.

The most common supervised projects within the average SBAE program relate to the animal science, plant science, and power, structural, and technical systems pathways. Baker et al. (2012) states that SAE's purpose "…should be to build student interest and develop important meta–skills, both of which support the classroom and FFA components" (p. 6). Davis et al. (2000) determined that students exhibiting livestock through their animal science SAEs developed employability skills, built character, and were able to use SAE profits to finance higher education. Doss et al. (2019) found that agricultural educators believed agricultural mechanics SAE projects are highly beneficial to students. It was also determined that records were kept for approximately half of the SAE projects (Doss et al., 2019).

This study estimated there to be approximately 865,243 SAEs nationally across all pathways. These projects resulted in approximately $558 million in income. Additionally, SAE investments in operating expenses totaled an estimated $635 million, and investments in non-current (long-term) assets totaled approximately 222 million. This calculates to an estimated $857 million in total investments from student's supervised projects. Hanagriff et al. (2010) found that Texas SBAE programs had an average direct investment of $93,222 on student's supervised projects. Additionally, Hanagriff et al. (2014) found that student's agricultural mechanics projects contributed $10 million in economic impact.

This study found that the average SBAE program has approximately $98,672 in direct spending from operating expenses and non-current (long-term) investments. This is contrasted with $64,212 in income per program from SAEs, with $36,325 coming from paid work (placement SAEs). This suggests that many SAEs were unprofitable enterprises in 2022. Unprofitability is common for new agricultural enterprises (Rissing, 2019). This lack of income can be concerning, considering Talbert et al. (2005) claims that learning financial literacy is one of the top purposes of SAE, and Retallick (2010) suggested that one of the main motivators for educators to promote SAE to students was utilizing financial management, record keeping, and record analysis to assist in employability skill development. While unprofitability is considered a negative economically, Rissing (2019) claimed that profitability was not the most accurate predictor of the long-term success of an agricultural enterprise. Students can still learn a great deal about financial management through an unprofitable supervised project. This financial literacy gained through SBAE exhibits itself long-term in the lives of students (McKim et al., 2018). McKim et al. (2018) determined that every Carnegie unit of secondary agricultural education completed results in an average of $1,850.67 in additional annual income for secondary graduates and $457.40 in additional annual income for postsecondary graduates.

The authentic and concrete experiences provided through SAE make it very effective at instilling employability skills (Coleman et al., 2024). The effectiveness of work-based learning opportunities, such as SAE, is critical to its longstanding popularity (Roberts, 2006). Coleman et al. (2024) describes how the ELT is threaded throughout agricultural education, including SAE. This vast impact is evident in the

resurgence of career and technical education (CTE) and work-based learning through the *Strengthening Career and Technical Education for the 21st Century Act* (Plasman & Thompson, 2023). While SAE implementation has a positive trajectory through legislative support (Plasman & Thompson, 2023), only approximately 52.3% of agricultural education students are engaged in SAE. Croom (2008) states that "for the [agricultural education] model to be successful to a significant degree, there must be a commitment by all stakeholders to deliver all components collectively" (p. 118). The 'SAE for All' model marks a professional rededication to SAE that will assist educators in engaging a wider audience of students in experiential learning. This model encourages SAE engagement for all students and provides actionable steps for educators to implement into their professional practice (NCAE, 2024). This more comprehensive implementation of SAE will engage more students in the complete agricultural education model and expose them to the employability skill development afforded through SAE and work-based learning.

Recommendations for Future Practice and Research

To ensure that agricultural education remains relevant for the 21st century, the profession must take strides to ensure that SAE opportunities are offered for all students (Croom, 2008). The 'SAE for All' model allows agricultural educators to engage a wider audience of students in non-traditional SAE projects (NCAE, 2024). The researchers recommend that agricultural education stakeholders provide detailed professional development on 'SAE for All' to increase in-service educator competence in SAE implementation. This type of professional development could be instrumental in improving the lack of confidence that Doss and Rayfield (2019) determined educators have regarding SAE implementation. To ensure preservice educator competence for the future, teacher preparation programs should evaluate degree programs to ensure that SAE coursework is required. This will ensure that 'SAE for All' is widely implemented and provides employability skill development opportunities for a diverse audience of agricultural education students. Additionally, educating agricultural education stakeholders, such as educational administrators, legislators, and industry partners, on the impact of SAE will help communicate its skill development benefits and relevance to 21st-century education.

As the 'SAE for All' model is implemented in SBAE, the researchers recommend examining its impact on student success and student skill acquisition. Coleman et al. (2024) explains the philosophical underpinning of experiential learning and its connection to agricultural education. The broader implementation of SAE through the 'SAE for All' model will help broaden SAE's impact to a wider audience. Additionally, with only 52.3% of SBAE students participating in SAE, research on which populations of students are excluded from supervised experiences should be conducted to assess parity. Furthermore, assessing the continued impact of SAE on economic value and skill acquisition for students is recommended.

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