Dr. Roger D. Hanagriff,
The AET & Texas A&M University Kingsville
Questions? roger@theaet.com

2020 Agricultural Education Engagement Executive Summary Report

In 2020, 6,351 agricultural education programs (secondary and post-secondary) comprising 47 states used the AET to track students' experiences in agricultural education. This analysis uses a sample of programs that consistently use AET, which offers more valuable insight into programs through their exclusive use of AET over time. The result is4,442 programs that illustrate consistent use in student logins, and SAE and FFA record-keeping serve as a representative sample (70%) of agricultural education programs.

The states that represent the largest portion of this sample cover both small and large state memberships. The top 10 states with program samples includes (1) Colorado (97%), (2) Nebraska (95%), (3) Wyoming (91%), (4) Oklahoma (91%), (5) California (90%), (6) Idaho (90%), (7) Alaska (88%), (8) Oregan (87%), (9) Montana (86%), and (10) Connecticut (86%) along with 37 other states. States not included in this sample are New Hampshire, Rhode Island, Puerto Rico, and the Virgin Islands due to their lack of AET use.

On average, this sample of 4,442 programs represents 54% of FFA programs in states (4,442 / 8,174) and 51% of FFA members (378,142 students in sample / 738,510 members) utilizing the AET. Table 1 provides a demographic summary of students and programs in this sample. An average of 2018 and 2019 values was used to develop a more longitudinal comparison.

Table 1 Sample Program Demographics (n=4,442)

Program Demographic	2020 Average (Per Program)	Value & Percent Change (2018 & 2019
Number of Teachers	1.83	1.83 (0%)
Active Students (all grades)	121	103 (+17%)
% of students with SAEs (Active)	57.7%	58.0% (-1%)
% of students with Journals (Active)	57.8%	74.5% (-22%)

As illustrated in Table 1, the number of teachers is the same as in previous years, but student enrollment appears to be 17% higher at 121 students per program (2018 & 2019). Considering COVID began impacting education in March of 2020, most programs are completed in terms of student numbers, but complete involvement is a question. SAE student numbers (those with any SAE records) appear to be stable with the nearly identical values as previous years (57.7% and 58.0%) but remain less than the desired 100% of students. In tracking engagement, student journal experiences (SAE, FFA, and Community Service) are 22% lower than previous year values (57.8% from 74.5%), which likely connects to cancelations due to Covid restrictions. In seeking to understand the impact of Covid on involvement, weekly engagement is also tracked using AET logins, which is summarized in Table 2

and provides potential effects from Covid by comparing values to comparable periods. Some comparisons are best made back to 2019, while others in Table 2 illustrate the progression of engagement to August 2021.

Table 2. Regular Weekly AET use Compared to Post-Covid Values

Comparison Indicators	Week #	Comparison	% Change
Initial Weekly Impact (March 16, 2020) Compared to Following Week	54,000	15,000	-72%
New School Year of Sept. 2020 Compared to Sept. 2019	70,000	48,000	-31%
New Calendar Year Jan. 2021 Compared to Jan. 2020 (Pre-Covid)	90,000	68,000	-24%
Ending 2021 School Yr. May 2021 Compared to May 2019 (Pre-Covid)	52,000	51,000	-2%
Beginning 2021 School (August 2021) Compared to August 2020	87,300	48,000	+82%

As illustrated in Table 2, a typical week in AET for March 16 tracked 54,000 unique students. Still, the following week the value sharply declined by 72% of students engaged and is likely a direct result from Covid. To gauge progression, in looking at the subsequent start of school in September of 2020, 48,000 students began tracking experiences, which is a 31% decline from September of the previous year. As the 2021 school year ended (May 2021), it appears that engagement was nearly the same as 2019 values, which potentially indicates a return to regular engagement. More encouraging is the starting of school for 2021 that shows the third week of August 2021 at 87,300 unique students, which compared to August 2020, is an 82% increase in student engagement. As 2020 data is summarized, the expectation of less involvement is a likely outcome.

2020 Agricultural Education Program Engagement

A core area of experiential learning commonly called a Supervised Agricultural Experience (SAE) in agricultural education is the main objective of tracking experiences and aligns to Career and Technology Education's (CTE) Work-based Learning Experiences. The SAE is first a planned learning experience that includes connections to academic content standards, includes records (time and money) to illustrate action items, and finally, aspects of record-keeping that allow students to reflect on project outcomes and measurable results. SAE is a core component of agricultural education and is aligned to the Pekins Funding requirement and essential metrics teachers can use to illustrate their program's value. Other forms of experiential learning include FFA and community service activities, which offer additional metrics for learning outcomes.

Table 3 summarizes engagement by SAE type per program and a national estimate of total SAE involvement within a program, which is estimated at 83 SAE projects per program. Compared to 2018 and 2019 average SAEs per program at 108, a 23% decline in total SAE numbers. Table 1 illustrates similar student SAE involvement (58%). Similar SAE students are one value, but fewer total SAEs per program demonstrate that students likely have few SAE projects per student. However, this decline in SAE projects is a negative impact on entire educational experiences. A complete 2020 summary of SAEs is listed in Table 3, including School-Based and Service Learning as an aspect of placement, entrepreneurship, or potential research projects.

Table 3. Student SAE Involvement Per-Program by Primary SAE Type (n=4,442)

SAE Descriptive Area	2020 SAE #	%	National Estimate (N=8,174 Programs)
Entrepreneurship (Owner/Business)	23	37%	186,449
Placement SAE (Work Exp.)	33	53%	269,681
Research SAE (Investigation, ect...)	6	10%	52,603
Total Immersion SAEs	62		508,733
Foundational SAE	21		168,632
Total SAEs Per Program	83		677,366

As illustrated in Table 3, the highest immersion category is placement (53%), with foundational SAEs representing about 21 projects per program. In reviewing all programs, 70% of programs have students tracking Foundational SAEs. Student SAE interest (AFNR area) and relative value are listed in Table 4.

Table 4. Student SAE Involvement by Interest Area – AFNR Pathway (n=4,442)

SAE Interest Area (AFNR)	Average (Per Program)	% Value per Program
Animal Systems	32.1	49.1%
Agribusiness Systems	4.0	6.2%
Leadership Education & Comm.	2.1	3.2%
Environmental Systems	1.8	2.8%
Food Products and Processing	3.7	5.7%
Power, Structural and Technical	6.5	9.9%
Natural Resources	1.6	2.5%
Plant Science	13.3	20.4%
Biotechnology	0.1	0.2%
Total SAE Interest	65	

As illustrated in Table 4, Animal Systems (49%) continually is the most common SAE area, with others listing lower percent values. An average program has 65 projects that align with an SAE interest area, mostly immersion SAEs (62 per program) but could include a few Foundational SAEs that are more aligned to student interest. A 2019 new addition to keeping records on SAEs is connecting academic skills as students' journal learning experiences. Table 5 illustrates the numbers of document skills gained from SAE projects by content area and a national estimate of exhibited skills from involvement in SAE experiences.

Table 5. Student SAE Skills by Academic Area (n=4,442)

SAE Descriptive Area	Mean Program Value (2020)	% Value per Program	2019 Value & Change	National Value*
AFNR Aligned Agribusiness	26.77	3.2%	21.37 (+25%)	218K
AFNR Aligned Animal Science	402.56	48.8%	328.54 (+23%)	3,29M
AFNR Aligned Biotechnology	2.76	0.3%	2.42 (+14%)	22K
AFNR Aligned Career Ready Practices	131.15	15.9%	107.64 (+22%)	1,07M
AFNR Aligned Cluster Skills	6.24	0.8%	5.28 (+18%)	51K
AFNR Aligned Environmental Service Syst.	10.91	1.3%	9.84 (+11%)	89K
Council Aligned Foundational Skills	56.53	6.9%	33.53 (+69%)	462K
AFNR Aligned Food Products and Processing	37.84	4.6%	31.68 (+19%)	309K
AFNR Aligned Natural Resources	11.09	1.3%	9.51 (+17%)	91K
AFNR Aligned Plant Science	94.49	11.5%	74.38 (+27%)	772K
AFNR Aligned Power, Structural, & Tech.	44.80	5.4%	34.03 (+32%)	366K
Total Academic Skills Recorded	825.14	100.0%	658.21 (+25%)	6,74M

**National value based on N=8,174 programs*

As illustrated in Table 5, overall skills connected to SAE involvement have increased (2019, 25%) even though students have been less engaged. However, as this was a new feature in AET for 2019, this illustrates that students are connecting academic skills within their SAE projects. New Foundational SAE skills, developed from the SAE-For-All Initiative, show the most significant increase (69%) in recorded skill alignments. The largest skill-related area is animal systems, which is likely connected to Animal Systems, the most frequent SAE interest area (Table 4). A general academic skill area that reaches into soft-skill development and all SAEs is Career Ready Practices (CRP), the second most reported area (15.9%). Nationally, students are estimated to be recording over 6.7 million academic skills that directly connect to SAE engagement, which is an increase from 2019 (5.7 million) and offers a positive connection to building experiences as they plan, record, and reflect on SAE projects.

Another way to summarize experiential learning is to view the recorded hours of SAE, FFA, and community service engagement, which is illustrated in Table 6.

Table 6. Students Time Invested (Journal Hours) in Experiential Learning (n=4,442)

Descriptive Area	Average (Per Program)	%	National Estimate (N=8,174 Programs)	2018 & 2019 (Change %)
SAE Journal Hrs.	3,634.8	88.0%	29,710,991	4,221 (-14%)
FFA Journal Hrs. (Offices, CDE, Committees)	348.1	8.4%	2,845,308	867 (-60%)
Community Service Journal Hrs.	147.7	3.6%	1,207,511	263 (-44%)
Total Hours	4,130.6	100%	33,763,810	5,351 (-23%)

As illustrated in Table 6, the total experiential learning time per program averages 4,131 hours and is estimated nationally at 33.76 million hours of learning experiences. Compared to previous years, that is 23% lower than the last two-year average of 5,351 hours. The highest engagement area is SAE journaling (88% / 3,634 hrs), which connects to recording academic skills and hours. However, other engagement in FFA and community service also offer experiential learning activities. FFA activities and Community Service (-60% and -44%, respectively) are lower than previous year values and seem to be the hardest-hit areas of engagement.

2020 Economic Values from SAE Engagement in Agricultural Education

Not only does SAE engagement involve time and learning but also financial investments and potential earnings. Table 6 provides a summary of student SAE earnings for a typical agricultural education program. Also illustrated in Table 6 is the previous two-year average (2018 & 2019) to help develop more conservative comparisons.

Table 6. Income Values from SAE Engagement in Agricultural Education Programs (n=4,442)

Area of SAE Income (SAE returns)	Average (Per Program)	%	National Estimate (N=8,174 Programs)	2018 & 2019 Ave.(Change %)
Paid Work Income	$27,178	38.4%	$222M	$22,729 (+20%
SAE Labor Exchange	$2,895	4.1%	$23M	$4,405 (-34%)
Cash/Market Sale	$20,683	29.3%	$169M	$20,914 (-1%)
Stock Show Sale	$8,957	12.7%	$73M	$7,253 (+24%)
Award/Scholarship/Premium	$3,554	5.0%	$29M	$2,343 (+52%)
Research Funding	$1,962	2.8%	$16M	$1,402 (+40%)
Used at Home	$1,278	1.8%	$10M	$835 (+53%)
Rental Income	$4,181	5.9%	$34M	$3,534 (+18%)
Total Value	$70,688	100%	$577.8M	$63,412 (+12%)

As illustrated in Table 6, an average program has students earning $70,688 in financial income, a 12% increase in earnings from 2018 & 2019 average program income ($63,412). The highest area of SAE earnings is paid work ($21,178, 38%), aligning with the largest SAE area (Placement SAE, 53%, Table 3). As SAE numbers are lower, but SAE income is higher per program, this shows some encouragement as students were able to grow SAE income, but again fewer students were involved in the experience. The areas of SAE income that increased by the highest values are Used at Home (53% increase) and Award/Scholarship/Premium (52% increase), which very likely relate to students having to alter their normal SAE planned income based on the impact from Covid. Many communities, livestock sales, and companies developed SAE scholarships and alternative income values to assist students, while many students used their SAE outcomes to support their families. A complete listing of SAE income value per program and changes from the previous years is listed in Table 6.

As students can earn income, these projects likely require financial investments such as needed job supplies, research expenses, and various agricultural common expense areas. These investments are valuable to the student's SAE and create financial community, state, and national economic impact values that drive economic growth and job creation. As students earn SAE-related income, these increases also relate to SAE operational investments listed in Table 7. The average program shows $65,221 in average SAE spending, a 64% increase from previous years (2018 and 2019) values.

Table 7 SAE Investments in Operating Expenses (n=4,442)

Area of Economic Investing	Average (Per Program)	%	National Estimate (N=8,174 Programs)	2018 & 2019 Ave. (Change %)
Inventory for Resale	$20,122	30.9%	164,479,625	$11,309 (+78%)
Feed	$19,646	30.1%	160,588,503	$7,847 (+150%)
Other Expenses	$5,930	9.1%	48,470,139	$4,737 (+25%)
Fertilizer/Chemicals	$2,692	4.1%	22,000,834	$2,656 (+1%)
Rent	$4,036	6.2%	32,993,408	$4,117 (-2%)
Contract/Custom Hire	$3,460	5.3%	28,281,223	$2,009 (+72%)
Paid Work Expense	$1,212	1.9%	9,909,941	$1,132 (+7%)
Supplies	$2,051	3.1%	16,761,759	$1,648 (+24%)
Seed	$1,475	2.3%	12,058,172	$1,252 (+18%)
Fuel	$938	1.4%	7,667,750	$667 (+41%)
Entry Fees/Commissions	$1,153	1.8%	9,426,186	$1,044 (11%)
Repairs/Maintenance	$1,313	2.0%	10,730,226	$720 (+82%)
Veterinary Medicine	$1,192	1.8%	9,746,618	$743 (61%)
Total Value	$65,221	100.0%	$533 Million	$39,876 (+64%)

Nationally, SAE spending is estimated to be $533 million, supporting local, state, and national economies. These investments are allocated across common SAE-related expenses, which are outlined in Table 7. The results of higher SAE operational expenses do likely connect to increases in SAE incomes, but it is surprising as total SAE engagement is down. However, higher cost of items in 2020 and more focused SAE students getting more involved may relate to these higher values reported, but it is worthy to note that SAE overall involvement was down in 2020. Other specific SAE operational investments are listed in Table 7.

Investment values also include non-current assets (long-term assets), such as breeding animals, machinery, buildings, and land, which are additional drivers to local, state, and national economies. Considering 2020, SAE's non-current item investment was $22,420 per program, which is less than the previous two-year 2018/19 value of $28,040. Once assets are measured, other impacts can be derived using economic multiplier factors ($1.90 per $1 in spending IMPLAN Type II Multiplier). Table 8 summarizes direct agricultural education program investment values and corresponding local economic impact values (direct spending and economic value).

Table 8 Direct Investments and Economic Impact Values from SAE Engagement (n=4,442)

Area of Economic Activities (SAE Investments)	Avg. Program Value Direct Spending (Per Program)	Avg. Program Economic Value[1] (IMPLAN 1.90, Type II)
Total Operating SAE Expenses	$65,221	$123,919
Non-Current Asset Purchases	$22,420	$42,597
Total Value	$87,640	$166,517

1 – IMPLAN Model values represent direct, induced, and indirect economic values derived from spending

As illustrated in Table 8, an average agricultural education program encourages an SAE investment of $87,640. In terms of economic impact, these programs are likely developing $166,517 in total economic impact that supports all business sectors of the region and are increases from prior year values. Once again, it is essential to note that although SAE investments were higher in 2020, total SAE engagement was down in 2020.

Economic values from agricultural education programs (FFA chapters) with SAE activities define local values and national values. As chapters have students investing in SAEs, these drive local business income and develop positive economic impact values. Table 9 describes the national economic impact value from SAE engagement.

Table 9 National Direct Investments and Economic Impact Values from SAE Engagement (N=8,174)

Area of Economic Activities (SAE Investments)	National SAE Direct Spending	National Economic Value[1] (IMPLAN 1.90, Type II)
Total Operating SAE Expenses	$533,114,383	$1,012,917,328
Non-Current Asset Purchases	$183,258,454	$348,191,063
Total Value	$716,372,838	$1,361,108,392

1 – IMPLAN Model values represent direct, induced and indirect economic values derived from spending.

As illustrated in Table 9, the national economic value of SAE engagement in agricultural education reaches over $1.36 billion in economic values, which support businesses and jobs. These values are increases from year levels and illustrate that educational activity total numbers may have declined. Still, SAE investments seem to have increased and likely connect to fewer intense students.

Application of Information

This report provides a summary of agricultural education at the local and national levels. This year's report utilizes a conservative approach to measure program values in the hope of capturing metrics that describe a typical U.S. agricultural education program. This report aims to share values of agricultural education and learning outcomes that illustrate both programmatic, academic, and economic importance. Appropriate use of these values can drive support in agricultural education or FFA programs, potentially prioritizing educational initiatives. Values listed here also may serve as comparisons to local program reports listed in AET.

As in the case of all research reports, standard error always exists when summarizing and extrapolating data; however, several key areas (% SAE involvement, SAE spending, and FFA involvement) were compared to a random selection of programs, and no significant differences were found, which does offer support that these values do represent specific programs in agricultural education with students tracking their educational experiences.

Any questions or additional information should be directed to the author, Dr. Roger Hanagriff with The AET and Associate Professor at Texas A&M University Kingsville – roger@theaet.com