

# The Agricultural **EDUCATION** MAGAZINE

*September/October 2024*  
*Volume 97, Issue 2*



**Skill/Competence Development  
in School-Based  
Agricultural Education**

# Incorporating Real-World Applications to Enhance Agriculture Content Knowledge

by Dr. Gaea Hock

**W**hat are the skills you are teaching in your agricultural education program? I am certain they are many! In addition to teaching 21st century skills (i.e. soft skills), we are also tasked with teaching content-specific skills and competencies.

## What are content-specific skills?

In the agricultural world, the tasks that agriculturalists perform daily can be categorized as agriculture content skills. These skills cover a broad spectrum of activities, such as operating tractors, formulating rations, providing medical care to sick animals, repairing water pumps, and plant propagation.

Agriculture teachers do an excellent job teaching their content areas, but sometimes the application of the content is not as robust. The opportunity for students to apply their learning may not be in a real-world setting. To address this, agriculture programs can leverage immersion experiences to enhance the application of content.

In Mississippi, they had tractor driving and tool identification competitions. These were not something I was familiar with prior to working with the Mississippi

agriculture teachers. I learned to appreciate the skills students were learning by participating in those events, in addition to the regular CDEs and LDEs.

In Kansas, the Kansas Department of Agriculture (KDA) hosts immersion activities to expose our students to careers in a variety of areas. Since 2018 there have been six immersion events ranging from beef and swine producers to landscape and ag equipment retailers. The industry professionals enjoy working with the students to get them excited about a possible career in their business while the students are able to apply what they have learned in the classroom in a real-world setting. Teachers also benefit from making industry connections and increasing student motivation to learn.

Helping our students find and complete supervised agricultural experiences (SAEs) is another way we can assist with skill development. They will learn how to do the job and improve their content skills while improving their responsibility, communication, and record keeping practices. My husband hires high school students to help around the farm. They are learning how to safely drive farm equipment, process cattle, pro-

vide basic animal health, remove musk thistles from pastures, and build electric fences. He is allowing them to develop their agriculture content skills while also teaching them what being a good employee looks like in the real-world.

What careers exist in your community? How can you teach content that prepares them to enter those fields? I encourage you to reach out to your local businesses to find out how they might be able to help develop the skills of our students (rather than just asking for a donation). Are their local producers and agriculturalists who would be willing to mentor your students?

Helping students develop their agricultural content skills through purposeful real-world application is feasible. In this issue of the magazine, you'll find practical advice and real-world examples that you can replicate in your own program to enhance students' knowledge of agriculture content skills.

## For more information about the KDA Immersion Activities:

<https://farmflavor.com/kansas/kansas-magazine/kansas-agriculture-2023/>



*Dr. Gaea Hock is a Professor of Agricultural Education at Kansas State University and Editor of The Agricultural Education Magazine.*



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## Article Submission

Articles and photographs should be submitted to the Editor or Theme Editor. They will acknowledge their submission. Items to be considered for publication should be submitted at least 90 days prior to the publication date of the intended issue. No items are returned unless accompanied by a written request. Articles should be approximately 1500 words. Information about the author(s) should be included at the end of the article. Photos and/or drawings appropriate for the "theme issue" are welcomed and should be submitted as separate files (jpg or tiff format preferred – minimum 300 dpi). A recent photograph (jpg or tiff format preferred – minimum 300 dpi) of all authors should accompany the article. Articles in the Magazine may be reproduced without permission but should be acknowledged.

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# Growing Need for Authentic Agriculture Skills

by Dr. Andrew C. Thoron

Over the course of my career, I have become increasingly curious about the status of skills-based teaching and attainment in Agricultural Education. When I hear statements that employers are most concerned with employability skills and not technical skills, I often think about those studies or statements with the understanding that those skills are brought to the front because employers have skills-based employees that are doing their skilled job well. As career and technical education, formerly vocational education, we must remain vigilant in the skills and technical competence for our agriculture industry. Agriculture technical skills, through experiential learning in our classrooms and SAE, is what sets School-based Agricultural Education (SBAE) apart from other disciplines. We need to remain cognizant of skill development even as the terms rigor and relevance, college and career ready, and assessment heavy phrases/initiatives steer our local programs. An ever more present skill gap is growing.

As a profession, we should look to partner with industry to remain relevant and provide authentic skills for agriculture in our SBAE classrooms. Many of us have read about the days of evening programs where the agriculture teacher delivered content to adults on new technologies that industry and producers hoped to incorporate into family operations. However, the agriculture industry has passed up

many of our SBAE programs and our schools no longer contain the tools of innovation. Many of our schools still have the 1950's technology of stick welders and old table saws from the 1970's and have since dropped evening and adult programs. One article, in this issue, addresses a call on community engagement and facility development for student skill acquisition.

We have several states with elementary agriculture. In Georgia, we have state legislation and already provide an endorsement through our teacher preparation

**I came to realize that the traditional student in SBAE does not come from a farm.**

program to realize these efforts. This is great, and it is making us think about what level of skill development is attained and how that may impact our middle and high school agriculture programs. Contained within this issue, there are two articles that focus on elementary and middle school skills-based thinking.

This issue also contains articles where we all might be inclined to first think about skills – Agricultural Mechanics. Thus, articles focused on Ag Mech, budget planning for laboratories, and work-based learning are contained in this issue. As a profession, we need to think about class size and the impact on agriculture skills teaching and acquisition. Teachers throughout the country are not only faced with a class size of

30+, but many are teaching two different subjects in the same period. Nationally, we need to be pushing back on this issue. Colleagues are being asked to teach Ag Business and Ag Mechanics in the same class period to 40 students. We need to be able to communicate the purpose of space, capacity, safety, and skill attainment in our classrooms.

Some in the profession state that beginning agriculture teachers lack content and skill knowledge in agriculture. This has been a top three factor within SBAE since the inception of

Agricultural Education. Sometimes we forget what it was like when we were a beginning teacher. Remember that teacher preparation programs are receiving students who were a product of several

pathway choices while in high school. For example, a student may have taken the Vet Technology pathway and completed the Animal Science pathway. Now they are in a teacher preparation program having no high school requisite knowledge of anything in agronomy, soils, food science, agricultural mechanics, horticulture, agri-business, forestry, or wildlife (and I probably missed a few others). Nonetheless, they are to obtain that knowledge while in college **and** learn to teach. Meanwhile, college courses have continued to become more technical, and a college student may need to take three courses in each discipline area to get into a course that provides hands-on application.

I have thought about this predicament for many years. I

started out being upset that the preservice teachers did not know what I knew as a 20-year-old. However, I grew up working 300 head of cattle, putting clutches in tractors, and driving a grain truck to the elevator when I was fourteen. I came to realize that the **traditional** student in SBAE **does not come from a farm**. The **non-traditional** SBAE student **comes from a farm** or production background. This has been true, in most locations, for nearly 30 years. Some teacher educators have blamed high school teachers, stating they did not know much from their high school experiences. Some teachers blame the college professors and teacher prep programs.

In the end, we should step back and think about curricular changes at the high school level and what that changed curricular-wise in agriculture teacher preparation. Most teacher preparation programs are still preparing agriculture teachers in a 1950 to 1980s model. I am speaking of the days of Ag 1, 2, 3, 4. Giving no thought on how to address students who enter teacher preparation having come from one of several different pathways. Then preparing an individual to teach in any of the possible 34 pathways.

I encourage our state associations of teachers to develop a list of foundational skills future agriculture teachers need and then work with their teacher preparation programs to ensure those are taught. Teacher preparation programs should address

those requisite skills through innovative courses, partnerships with current teachers and state staff, and out-of-class skill development while students are studying to become teachers of agriculture. To teach those skills, preservice agriculture teachers need to be able to do the skills, build efficacy, then prepare to teach them to future students. There are creative solutions to this growing need. In this issue Dr. Mulkey and Mr. Beacham share the thinking that we are following in a teacher preparation program and Dr. Wells et al. share insight on teacher professional development.

Skill development should continue to be foundational in our subject area. We place our students at an advantage to obtain quality jobs and careers within our industry. I recognize that not all students may pursue a degree or a career in agriculture; but we cannot lose sight of our CTE mission and partnerships. In the final article, the focus shifts to the collegiate journey of students as they embark on international experiences, highlighting the transformative impact on their skill development and overall growth.

I encourage a national conversation and sharing via the Ag Ed Discussion Group on Facebook for what local programs are doing to focus on agriculture skills and encourage engagement in offering authentic skills-based teaching and learning to preservice teachers or new agriculture teaching professionals. Could national initia-

tives of paid summer internships for teachers be worthy of exploration? Perhaps providing opportunities to teachers who want to learn new skills or brush up to stay current with industry could gain momentum and be used to forge partnerships with industry. Reaching out and partnering with industry could get cutting edge technologies into more agriculture classrooms and laboratories.



*Andrew C. Thoron is Professor and Department Head of Agricultural Education and Communication at Abraham Baldwin Agricultural College (ABAC) in Tifton, Georgia.*

# Where There's a Will, There's a Way: Using Your Community to Realize Large Facility Projects

by Zachary Callaghan

## The Wants and the Needs

Every agriculture teacher has done it. You walk into another ag teacher's classroom, shop, or lab space and identify all the cool things they have that you don't. Whether it's a machine in the ag shop, a CDE resource, an intricate veterinary simulation device, or even an entire facility, we've all been a little envious of the teacher or program that found a way to acquire these items. Career and Technical Education programs are known for their pedagogical effectiveness through the experiential learning process. All of these machines, simulators, teaching tools, and facilities are the primary means in which we can provide those experiential opportunities that are so valuable. While we know the benefits of these tools, we often face one huge hurdle in obtaining them: the cost.

I imagine ag teachers are some of the best money managers in their districts. Many of us are constantly checking in on our department budgets, utilizing our Perkins Funding to their fullest potential, applying for grants, and soliciting donations in order to provide our students with the high quality hands-on experiences they need. However, when it comes to larger projects, such as a new facility or lab space, it's hard to imagine those projects coming to life without the help of a school construction bond project. Undoubtedly, more work is involved when taking on a project of this magnitude outside of a bond project, but it can be done if you surround yourself with a team of people who have similar visions and enthusiasm for the future of your program.

Embarking on a project like this should have you questioning

the wants and needs you have for your program. There's a lot of items we want to have for our programs but for a successful project you must identify the true needs of your community and students. In Kansas, the state I teach in, we are home to what's known as the Kansas City Animal Health Corridor, which is the largest concentration of animal health companies in the world. We are also the largest pet food producing state and rank nationally for our livestock production, particularly beef. The careers related to animal sciences, health, and industry in our state are plentiful. Our facility currently has space for a welding shop, ag mechanics lab, greenhouse, and hydroponics farm, yet our animal science courses are some of our most popular and do not have a dedicated experiential learning space. The need for more qualified graduates of post-secondary

animal science programs, coupled with our high level of interest in animal science courses, helps to illustrate the need for a dedicated animal science learning space. This need is where our endeavor to construct an Animal Science Learning Center on our school campus began.



*Rendering of the exterior of the proposed Chanute FFA Animal Science Learning Center*

## Leveraging Your Human Resources

I've only taught in my current school district for one year. I was immediately welcomed and felt a great sense of support for the Ag Program and FFA Chapter. The idea to construct an Animal Science Learning Center preceded my time in the district, and started out of conversations with my teaching partner and our Advisory Committee, but I was ecstatic to jump in and help with the planning process... that is until I heard the price tag. The architect who designed our building gave a rough estimate of \$1.4 million dollars to construct the facility. Ouch. While I had my hesitations at first, our Advisory Committee didn't bat an eye and were confident we could fundraise the full amount. This is where surrounding yourself with others who have similar visions and enthusiasm for your program is integral.

CTE Advisory Committees are often not used to their fullest potential in our programs... many teachers view them as just another box to check off to receive

their federal funding. But, if we're using our Advisory Committees in the way they are intended, they are the perfect resource to help you pull off a project of this magnitude. If used correctly, they are the one group who should truly understand the gaps in our curriculum, student needs, the facility needs we have, and can bring the community's voice to our program. All of these components will be instrumental in seeing a large project like this through. Advisory committees can also provide bridges between industry in our area and our classrooms, which can definitely help with the funding side.

If an Advisory Committee isn't a feasible option for your program, other schools have

used their local FFA Alumni and Supporter chapters to lead capital projects. A local alumni chapter in Kansas recently fundraised to construct a state-of-the-art greenhouse for their program. Whether it's your advisory committee or alumni/supporters chapter, the wealth of community knowledge, experience, and manpower these teams can bring may determine the project's success.

## The Campaign Trail

It's nice to think about the shiny new building that will someday, hopefully soon, be sitting directly behind our Ag building. The part that maybe isn't so nice to think about is the fundraising and work leading up to that point. While Ag Teachers

“ Use your community members, industry, and organizations as leverage to achieve the large goals you have for your program. ”

*School administrators, school board members, Ag Advisory Committee members, and CHS Ag Instructors speaking at a kickoff event for the capital campaign to construct an Animal Science Learning Center in May of 2024.*



are pretty articulate in the world of fundraising, most of us aren't trained to lead large fundraising campaigns. Running a capital campaign is truly a labor of love and it can't be done on your own. On our campaign team, we are fortunate to have several individuals on our advisory committee who've had experience working on other capital campaign projects - which has been a tremendous asset. This is where community members can step in and help, especially if you're newer to the area you teach in and maybe don't have as many community connections.

A strategy our committee devised was to raise a significant amount of funds prior to announcing the full fundraising campaign. We had several large donors, including a family who donated the land the building will sit on, commit prior to going public with our project. The project was officially announced in May of 2024 with just over 25% of the funds raised. Nearing the end of the summer, we had half the money raised. Instead of starting at \$0, that 25% provided some

momentum and communicated to potential donors that the project was well underway. We still have halfway to go on our campaign, but our committee is confident the funds will continue to roll in - which is the confidence you need to see the project through to the end.

Other items our committee considered were the timeline donors could give money over, the entity in which the funds were collected, and how to advertise the project to the community. Our donors have the option to give over a five year period, which helps increase the size of donation one individual or entity can give. Our donations are also run through our school's education foundation, which allows for donations to be tax deductible, providing another incentive for donors. We also allow for in-kind donations to reduce the overall cost of the project. Some examples of in-kind donations we are seeking include construction materials, labor, reduced administrative fees, among others. Our school's business and digital media programs helped to create

promotional videos, banners, and flyers for our campaign marketing. We've spoken at Chamber of Commerce meetings, Rotary Club meetings, set up tables at community events, and have posters with rendering of the new building on display at school events. The promotional materials and events have generated numerous inquiries about the project and have helped to bring in donations.

### **Greenhands and Green Thumbs**

Our program recently embarked on a much smaller facility project with the help of our community and an organization called Community Green Farms. This project called for converting an old shipping container into a hydroponic farm to grow leafy greens. This facility is primarily managed by our horticulture students, who sell the greens produced in the farm to our school cafeterias and at our local farmers market. This project cost approximately \$100,000 but, by partnering with Community Green Farms, we didn't have to do any of the "asking." While the

*(LEFT) Ribbon cutting for the Chanutte FFA Hydroponics Farm in September of 2023.*

*(RIGHT) Chanutte FFA Member Tessa Golay working in the Ag Department's Hydroponics Farm.*





hydroponics farm at our school was one of the first produced by Community Green Farms, they have since received grants to place these hydroponic farms at schools across southeast Kansas. Sometimes there are organizations that are seeking to achieve similar goals to us which, like in this case, can make our lives easier as we benefit from the work they are already doing. Use your community members, industry, and organizations as leverage to achieve the large goals you have for your program. You will have more people invested in your program, more opportunities for your students, and less time stressing if you had decided to take it on by yourself.

### Best Practices

1. Surround yourself with a team who shares a similar vision and enthusiasm for your program.
2. Identify the true needs of your students and community to sell the project: wants are nice, but the community needs to see the value.
3. What benefits will donors get out of giving to your project? Tax incentives, naming rights, recognition of sorts?
4. Find your fundraisers: who in your community has experience with projects like this and has the time to assist?



*Renderings of the interior and classroom in the proposed Chanute FFA Animal Science Learning Center.*



*Zachary Callaghan is fifth-year agriculture teacher/FFA Advisor at Chanute High School in southeast, Kansas.*

# Agricultural Skills Can Be Attained at Every Grade Level

by Courtney Castle

**A**s agricultural educators, we very often come to realize that we are educators of all ages and grade levels. Whether it's in the daily lessons of our classroom, a conversation at our local grocery store, a project visit or a school board meeting, there is always an opportunity to educate the public about agriculture. As we move towards a society that becomes more and more technologically advanced; we also move towards a society that is even more disconnected from agriculture production.

As agriculture teachers and programs face these ever growing challenges, we find ourselves looking for ways to educate students

at a younger age, trying to bridge the disconnect between agriculturists and consumers and trying to instill a passion and interest in the youngest generations in the hopes of creating more agriculture-career ready students. It's a daunting task and can seem overwhelming given the expansive learning differences when you compare an early education student to a middle school or high school student. However, there are practical ways to teach agricultural skills to students in elementary grade levels.

**Look at major growth developments at the various grade levels and incorporate those into your lessons.**

When planning what and how to teach at various elementary

grade levels, you have to take into consideration what that child is learning from a fundamental standpoint. Take for example, a student in Transitional-Kindergarten or Kindergarten. They are 4 to 5 years old, cannot read full sentences and are working on fine-motor skills. This all has to be taken into consideration when planning for this age group. Hands-on lessons that build fine motor skills would be the most appropriate for this age group. Planting seeds, transplanting

The excitement and eagerness elementary students have, and the agriculture skills gained at these grade levels will easily transfer into their high school years and beyond.

succulents, or using sensory bins where students have to match an agriculture product to its commodity would all be great activities for students to experience agriculture at an early age.

For students in second or third grade, utilizing monthly Taste & Teach lessons from California Agriculture in the Classroom, continues building skills connected to Plant Science and Farm-to-Fork while strengthening the skills gained in Kindergarten when they first planted seeds and utilized commodity sensory bins. These students are emerging readers and can begin reading food labels or plant packets associated with the monthly food item they are learning about.

**Build connections with local industry partners and secondary agriculture programs.**

Another practical step to teaching agricultural education in elementary grades is taken straight from the secondary program playbook; utilize industry connections. Set up industry tours and field trips to local agricultural businesses and farms. Invite agriculturalists to your classroom. Host an ag career day with your elementary students and bring in individuals from the

animal science, plant science, mechanized agriculture and agribusiness sectors. Collaborate with your local secondary agriculture programs. Include them in your curriculum planning

and school farm designs. If you don't know what pathways your secondary programs offer, find out and then teach skills that will give your students a foundation for their high school ag class. Reach out to your local high school ag mechanics teacher and see if their ag mechanics students can create picnic table or planter box kits that can then be brought to the elementary school for fifth through eighth grade students to assemble.

Our seventh and eighth grade students who show meat chickens and turkeys at our community fair in May take their extra birds to a local high school ag program for processing. Our students, alongside high school animal science students, take a live market animal and turn it into a con-



(LEFT) Middle school FFA students prepare their meat chickens for the community fair by washing and drying the birds prior to going to the show.  
(RIGHT) Elementary students participate in Nutrien's Seed Survivor Mobile Classroom and learn about plant and soil science.

sumable product all while practicing industry standards. That collaboration and connection is strengthening and building skills for all students involved.

### **Pull resources and build a comprehensive model that works for you.**

Trying to plan and teach to all elementary grade levels is a challenge but ag teachers have proven time and time again that we are up to the challenge. I have found that utilizing lessons from various resources such as the CASE AgXplore, National FFA, Georgia Ag Ed, California Ag in the Classroom, as well as shared lessons from teachers in my state and creating monthly themes works best.

For the current year I am planning lessons around the following topics (beginning in August and continuing each month respectively): FFA and our local county fair, CA Agriculture, Pumpkins & Gourds, Animal Science, Plant Science, Ag Mechanics, Floral Design, Entomology, Local Community Fair, and Ag Careers. Students in grades TK

through eighth will all focus on the monthly topic but the skills and lessons within each topic will differ based on the grade levels of the students. For entomology, students in TK and Kindergarten will have activities that include sorting insects into different number groups to incorporate basic math skills, while students in second through fourth grade will learn about insect anatomy and life cycles. Students in grades fifth and sixth will identify various insects based on their order, genus and species while seventh and eighth graders will complete insect collections and have a PCA guest speaker.

The lessons, skills and concepts taught at the elementary level should be on the continuum of learning and follow the ideas of a pathway completer at the high school level. What skills does a high school introductory level ag class offer that build up to the capstone class of that pathway? What basic knowledge and skills will a Kindergarten student need to allow them to complete agricultural education at higher grade levels?

### **Embrace the excitement and inquisitiveness that comes from learning at the elementary level.**

Students at the elementary level are full of excitement for learning. They ask all the questions and you can see their inquisitive minds at work at all times of the day. The world really is a blank canvas to them and, as an educator, there is no better time than these early years to teach them about agriculture. Elementary students risk boldly and aren't afraid to take chances. They have a genuine curiosity for the world around them and are willing to try new things. Harnessing that energy and drive into agricultural education really is the sweet spot. Not only are we building our next generation of agriculturalists through this process, we are building more conscientious consumers, those who know what it takes to feed people locally and globally, and those who appreciate what it means to be "in agriculture."

I am starting my sixth year of teaching at our elementary



(LEFT) A third grade student shows her excitement for ice cream making during National FFA Week. (RIGHT) Students are proud of their ag commodities pictures that earned blue ribbons at the local county fair.

school and my fourteenth year in agricultural education, and I am still amazed at how much excitement and passion my students have for learning. They literally stand up and cheer when they realize they are going out to the school farm. I'm not sure I can remember the last time I had a classroom full of high school students cheering because they are going to go out to the school farm to clean pens and pull weeds. Students are learning practical skills at this stage; how to use a shovel properly, the difference between a leaf rake and a bow rake, what an annual plant is and the difference between laying hens and meat chickens. They are

learning how to hold a halter and lead a goat or lamb around. They are learning responsibility and to be stewards of the land. I feel that we often take these very basic but important foundational skills for granted because, as ag teachers, they come second nature to us. However, I know we have all had a student in a secondary ag program that has never picked up a shovel, pushed a lawn mower or worked a gate until they entered their high school ag program.

I can speak from experience that every spring when our meat chickens arrive at school, all students from TK to eighth are in my classroom to see them. They

watch them grow on a daily basis and ask about their weights, tell me about any changes they notice and ask when the fair is. All students know these birds are terminal but understand the value of the project and the final product that comes from it. This past spring, I listened to two third graders tell each other that they can't wait to be in seventh grade so they can show chickens. That is the excitement and eagerness elementary students have, and the agriculture skills gained at these grade levels will easily transfer into their high school years and beyond.



Courtney Castle is entering her fourteenth year of education and currently serves as superintendent, principal, agriculture teacher, and FFA advisor at Saucelito Elementary School in Terra Bella, California.

# Incorporating Agriscience into Middle School Curriculum: Strategies and Activities

by Jacob Englin

It was during my third year of teaching when I decided I would incorporate components of the agriscience fair into my 8th grade coursework. After a student finished his presentation, we walked out of the project-filled gymnasium and he looked at me and said, “That was easier than I thought it would be.” This student was nervous about presenting his research, and he was proud of the months of work he put in toward completing his project during the 18 weeks of class. I was proud of him, too. However, the agriscience fair was just one component of the curriculum that I implemented with my 8th grade students to encourage exploration in the agricultural industry.

Research indicates that middle school is a time of exceptional growth (National Middle School Association, 2010). During middle school, students between the ages of 10 and 15 undergo significant and rapid transformations on both a physical and developmental level. It is around this time when students begin to question their relationships with peers, experiment with their identities, and ponder their future career options. As middle school school-based agricultural education (SBAE) teachers, we can assist students as they navigate through these changes by providing holistic approaches in our teaching methods and provide students with learning experiences as they ask the question, “what do I want to be when I grow up?”

It is around this time when students begin to question their relationships with peers, experiment with their identities, and ponder their future career options.

## What do middle school students need?

While I no longer serve in a role as a SBAE teacher, my research areas have focused on advancing middle school SBAE programs. Through my research at Louisiana State University, I have had time to reflect on my experiences working with this unique group of learners. I have identified the following as key needs of middle school students:

1. **Structure** – Middle school students need their learning activities to be delivered in a way that follows lists, steps, and check points. Their developing brains work best when they can follow a series of laid out plans to complete learning activities.
2. **Experiential** – Middle school students excel at learning through hands-on approaches. Whenever working with these learners, it is important to incorporate tactile activities where students get to try, make mistakes, and adjust until they are successful.
3. **Movement** – We can all remember back to our days as middle school students or think about the students

in our own classrooms. They like to move. Whenever possible, try to incorporate chunked activities that allow students to get out of their seats and actively participate in their learning.

## How do we do this?

Middle school programs look different across the nation. Programs can vary from six weeks to a full year, but there are several ways to incorporate structure, experience, and movement into our lessons. Because I wanted to expose students to multiple AFNR pathways, and still include the agriscience fair, I followed a very structured approach to developing my units of instruction. A typical semester is outlined in Table 1.

## Activities Explained

I have learned most of these activities through discussions with other agriculture teachers, online, or at professional development programs. Through my eight years of teaching, I was able to curate which activities I wanted to focus on based on the goals of the program and the available resources. Below I explain in further detail activities both the students and I enjoyed:

**Table 1. Eighteen-week middle school curriculum outline**

<i>Week</i>	<i>Topics</i>	<i>AFNR Pathway Activities</i>	<i>Agriscience Fair Project</i>
1	Safety in Agriscience  What is the agriscience fair?	Bubble Gum Lab – students chew gum, collect mass, record data, and display results on miniature agriscience	Agriscience fair topic examples and pathway matching activity; agriscience fair topic brainstorming
2	Agriculture in the U.S.	Mapping commodities in the U.S. according to USDA data	Topics finalized; research article review to practice writing Other's Work section; begin writing Other's Work
3	Large Animal Science	Livestock industries vocabulary (bull, heifer, steer, etc.) table and Quizlet review	Five Other's Work articles due and submitted
4	Small Animal Science	Dog breeds research project; cardboard dog show	Materials and Methods development; review steps in the Bubble Gum Lab
5	The FFA Creed	One paragraph per day; P1 – rearranged phrases; P2- draw out with images; P3- picture collage; P4- develop a song or rap; P5- recite to three friends	Students complete the Importance section of the agriscience fair template
6	Opening and Closing Ceremonies	FFA officers; practice ceremonies in class; use of the gavel	Data Collection – students conduct their experiments and collect one month worth of data, if necessary
7	Parliamentary Procedure	Practice basic motions in Robert's Rules of Order	Data Collection
8	FFA Opportunities	FFA CDE Rotation Stations	Data Collection
9	Plant Anatomy	Plant anatomy and alstroemeria flower dissection	Data Collection
10	Soil	Soil basics and aggregates; texturing soil	Students used data provided by <i>Project Wild</i> to learn graphin
11	Greenhouse and Plant Growth	Discuss plant needs and growing media; plant seeds in the greenhouse	Graphs Due
12	Farm Machinery	Select an agricultural machine or implement to research and teach classmates	Results and Discussion section of agriscience fair template
13	Hand Tools	Hand tool safety; hand tool identification Quizlet activity; hand tool identification quiz	Summary paragraphs
14	Shop Safety	Basic shop safety with hand tools and power tools; research nail-and-string art project	Students paper peer review and edits
15	Nail-and-String Project	Work in the shop to construct nail-and-string projects	Final Paper Submitted
16	Wood Project	Work in the shop to construct wooden bird feeder	Agriscience Fair Application Completed
	Careers	Ag Explorer career assessment and presentation	Agriscience fair board building
17	Agriscience Fair	Agriscience fair board building	Agriscience fair board building
18	Agriscience Fair	Agriscience Fair Presentations	Agriscience Fair Presentations

- **Bubble gum lab** – Students hypothesized what happens to the mass of bubble gum after it is chewed for five minutes. They collected data and reported results. This project set them up for the agriculture fair project.
- **Livestock vocabulary** – Provided by National FFA Organization, students completed a table with vocabulary, developed Quizlet flashcards, and completed generated quizzes.
- **Mapping commodities** – Students reviewed commodities produced by various states and recorded information on a classroom map. We discussed how climate impacts agricultural production.
- **Cardboard dog show** – Students researched and selected a dog breed based on their desired future lifestyle. Students build a 2D model of their dog to standard size and standard colors. We hosted a dog show with administrators serving as judges where they asked students formative questions about their dogs.
- **Hand tool identification** – Students learned the proper names and uses of the common hand tools that we had in our shop. They used these tools to create a nail-and-string project of their choosing. They searched online for templates.
- **Wood project** – Students learned safety procedures for the miter saw, orbital sander, power drill and attachments

then used the tools to construct a wooden toolbox.

- **Career assessment** – Students completed the My Career Quiz provided through the Ag Explorer from the National FFA Organization and researched specifications toward getting placed in that career.
- **Project Wild** – This curriculum and activity guide provides wildlife and natural resources activities and projects. I selected an activity that provides data on black bears and used that to instruct students on how to graph data.
- **Agriscience Fair** – Students completed checkpoints throughout the semester toward completing the requirements of the National FFA Agriscience Fair. While not all students competed in the state competition, all students completed the project for a class grade.

### Final Thoughts

Every program is different, especially at the middle school level. For instance, not all state FFA associations offer programming for middle school, and lengths of instruction vary by district. By intertwining the agriscience fair with AFNR topics, the students were exposed to a variety of topics in the agricultural industry and set them up for exploring future courses in high school. The selected topics were experiential in nature and allowed the students to explore essential basics in agricultural education,

become familiar with components of FFA, and relate potential careers to agriculture. I hope that you can take pieces of this curricular plan, adapt it to your own programs, and continue to advance opportunities in middle school agricultural education.

### Resources

- **My Career Quiz:** <https://agexplorer.ffa.org/>
- **National FFA Agriscience Fair:** <https://www.ffa.org/participate/awards/agriculture-fair/>
- **Project Wild:** <https://www.fishwildlife.org/projectwild>
- **Quizlet:** <https://quizlet.com/>
- **USDA State Fact Sheets:** <https://www.ers.usda.gov/data-products/state-fact-sheets/>

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*Jacob is a doctoral student in the department of Agricultural and Extension Education and Evaluation at Louisiana State University. Previously he taught agricultural education in South Dakota. His research focuses on advancing educational opportunities for middle school SBAE teachers and students.*

# Connecting your Agricultural Mechanics Classroom to the CDE

by Dr. Christopher Crump

To recruit students for our classes, we boast about how we teach skills that will aid them in becoming welders, foresters, greenhouse managers, veterinarians, and more. However, how can we expect students to enroll in a course to prepare them to enter a career when they have not found their passion? Therefore, if our selling point in recruiting students is that it will prepare them for the workforce in our classrooms, what is our selling point in getting them to participate in a Career Development Event (CDE)? It leaves further questions about whether students should participate in a CDE beyond their desire to “win.” Due to this, I argue that we should recruit students into class to allow them to discover what they love. When I was a student, I did not have any exposure to agricultural mechanics at home. However, due to my experience in class, I discovered my passion for the subject. My first agricultural mechanics class fostered my desire to learn

We as agriculture teachers have to use our programs to discover what our students are passionate about while allowing them to gain foundational knowledge and career-ready skills through CDEs.

mechanics. However, my desire to teach agricultural mechanics did not come until I competed in the Agricultural Technology and Mechanical Systems CDE. We should strive to get our students to follow this progression of passion to build more adept and involved agricultural education students. We have to stop selling our programs short by saying that classes will develop your skills for your future career. Instead, we should tell students that this will allow them to find their passion, which they can build upon to make their future selves more successful.

Of course, our courses need to revolve around industry. For example, when we teach about small gas engines, we need to ensure students understand the theory of internal combustion engines and not just teach them how to tear down the same engine repeatedly. We must teach students how to run a welding bead using an E7018 electrode or how to adjust the welding machine amperage. However, we must be realistic as teachers and realize we are teaching classes that sometimes exceed 25 students and cannot overwhelm students with so much information it deters them from our class. Still, by supplying enough information, students can make informed decisions regarding their passions while also acknowledging that it is nearly impossible to feed the most ardent students enough information in class to sustain them. Consequently, we as agriculture teachers need to teach



*These are four students who took every agricultural mechanics course they could and found a passion. They then decided to compete in the Agriculture Technology and Mechanical Systems CDE in 2022 and were named the National Champions.*





(LEFT) The students in the picture are ones who were on the 2024 Agricultural Technology and Mechanical Systems CDE team in Georgia that will compete in the national contest in October 2024.  
(RIGHT) A student in Agricultural Mechanics II uses a dial caliper to take the outside diameter measurements of a cam lobe to determine if the lobe has worn enough to be rejected and needs replacing.

our students to the best of our ability and guide those students who are most eager about a particular subject matter to participate in CDEs.

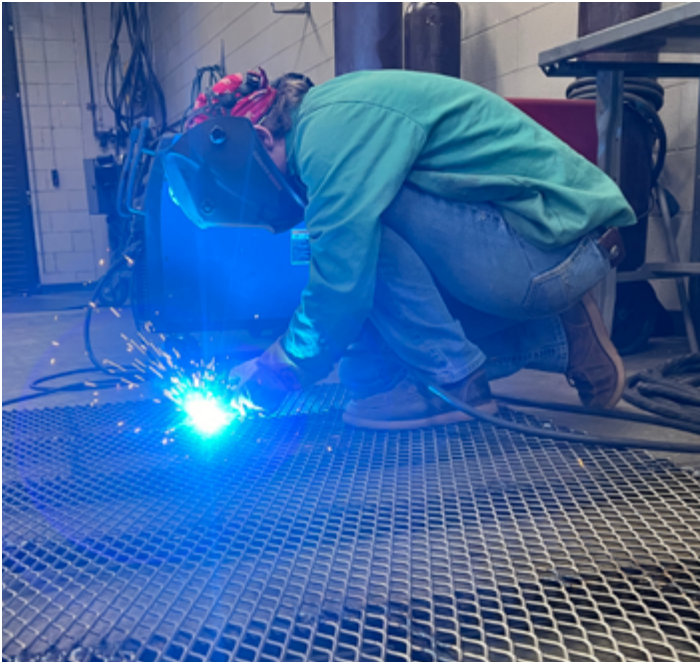
As alluded in the examples above, I would like to turn our focus to the Agricultural Technology and Mechanics Systems CDE. This CDE focuses on the mechanical side of agriculture, which includes construction principles, electrical applications, machinery, compact equipment, welding, and various environmental natural resource (ENR) management topics (National FFA Organization, 2023). The skills provided to students should allow them to enter careers around a given skill and make them more capable than those who did not participate in that CDE generally, as they will not have the same exposure. This CDE can be divided into five main topics: electrical, compact equipment, machinery, welding, and ENR principles applied within agricultural mechanics.

The electrical component of this CDE varies in focus each year. However, its overarching intention is to allow students to develop skills in various electrical applications, ranging from general residential wiring to commercial electrical motor applications (National FFA Organization, 2024). This CDE encompasses not only single-phase electrical systems but also allows students to learn about three-phase electrical applications. Moreover, this CDE strives to develop student awareness regarding the National Electrical Code, the minimum electrical wiring standard nationwide. It is easy to surmise that students participating in this CDE will be much more capable if they strive to become electricians. However, what if that is not their goal? What if they want to become a lineman? This CDE still has merit. Linemen must have knowledge of phases, grounding, voltage drop, and other electrical topics that students must learn to be competitive in this CDE. Also, students

who pursue production agriculture will find this CDE topic relevant as electrical motors are used in various locations, from chicken house fans to feed augers or even well pumps. Beyond having a career in electricity, the content is realistic for anyone planning to own a home to make repairs.

Furthermore, this CDE topic is especially pertinent for students pursuing production agriculture, as electrical motors play a crucial role in various settings, including chicken house fans, feed augers, and well pumps. In addition to its relevance for those seeking a career in electricity, the content is also practical for individuals planning to own a home, enabling them to make repairs independently.

This CDE's compact equipment and machinery components focus on agricultural equipment but vary in size. Typically, compact equipment includes engines or equipment that has less than 30 horsepower.



*(LEFT) The student pictured enjoys honing his skills in multiple welding processes and is repairing a trailer ramp. Due to this student's interest, he also participated in the Agricultural Technology and Mechanical Systems CDE.*

*(RIGHT) Inside more advanced agricultural mechanics classes, students are expected to be able to use an automatic level to determine slope, distances, grade elevations, and elevation change over long distances by using differential leveling.*

er while machinery pertains to larger farmer equipment, including planters, grain drills, sprayers, combines, and more (National FFA Organization, 2024). Both of these components want students to be able to determine how equipment operates and adjust or complete repairs determined by the operation. Both components aim to equip students with the ability to comprehend the operational mechanisms of equipment and make the necessary adjustments or repairs based on the observed functionality. Also, the event requires students to be able to locate information in the owner's manual. It is easy to see how this event benefits students entering a repair shop. However, many of us talk about how engineers should work on equipment before designing equipment. Therefore, this CDE serves students with an engineering mindset by allowing them to see how the equipment operates

and how it is used to allow them more hands-on experiences to draw upon in their future. Furthermore, students pursuing sales may find this fulfilling as it gives them a basis of equipment operation to build upon when discussing equipment with potential customers.

The structural side of the CDE will commonly revolve around various arc welding applications, whether that be shielded metal arc welding (SMAW) or flux-core arc welding (FCAW). It will also require students to be able to read welding diagrams, identify joints, set up the welding machine, prepare materials, and use precision measuring instruments for layout (National FFA Organization, 2024). The above competencies would benefit any student pursuing welding. However, any student who wants to pursue machining exposure to precision measuring tools and metallurgy will prove beneficial in this endeavor.

The ENR topics can include soil erosion, irrigation, leveling, well pump calculations, and more. This topic is frequently much more diverse than many others in its scope (National FFA Organization, 2024). Still, it would benefit any student pursuing a career in natural resources as it offers a diverse perspective. For example, in the past, water calculations for rainfall and flood irrigation were completed. This is especially beneficial for students wanting to raise row crops as they understand water output, how to determine the volume of water needed for the crops, and what is being applied through irrigation or rainfall. Also, if a student is pursuing a soil and water conservationist position, exposure to how rainfall and erosion work in unison will allow them to offer advice to mitigate the effects. Furthermore, if a student plans to pour concrete or other construction principles, using

builder's levels in the CDE allows students to gain exposure to their application.

Looking at these topics in the CDE, it is easy to see how they can relate to many careers. It is not just for electricians, welders, and mechanics, but much more. This CDE enables many students with different interests to broaden their horizons and let them gain knowledge and skills in teamwork and communication through the team activity portion of the CDE. All agriculture teachers want to see their students win CDEs, including me. However, I think we can strive for students' success while also preparing those same students to excel as they enter the workforce. I hear other agriculture teachers say, "What do you do when students drop out of the competition?" This is difficult because students can be unsure of themselves. However, I believe that if we recruit students to participate in CDEs they are interested in pursuing as a career and prepare them well, then students' ambiguity will diminish.

We as agriculture teachers have to use our programs to discover what our students are passionate about while allowing them to gain foundational knowledge and career-ready skills through CDEs. We must stop selling our programs short by telling students unknowingly that they will gain career-ready skills only in our classrooms. Let's start to sell our programs as a way for students to find their passions in the classroom and sell CDEs as a way to prepare students to enter

their careers and become a step ahead of their peers through the skills they will gain. We must stop looking at CDEs as contests but as what they actually are: Career Development Events. As agriculture teachers, let us use CDEs to train our students for careers and not only as a way to hang banners on the wall. If this philosophical change is made and we use CDEs for the right reasons, the winning will handle itself. This transition in how we sell our programs will allow us to more completely fulfill the three-component model for agricultural education designed to serve and develop students.

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*Dr. Christopher Crump has been teaching agriculture for the past seven years and has been at his alma mater for the past five years as the agricultural mechanics teacher at Banks County High School in Georgia.*

# Money Money Money: How to Prepare Students for Skills with Budget Expectations

by Andrew Fritsch & Naythan Jewell

**M**any beginning teachers are intimidated by the idea of teaching mechanics. Everything from the student safety, content knowledge and management of the facilities can be overwhelming to a new teacher.

One of the biggest obstacles in teaching ag mechanics is money. Shop classes are expensive. A 50 pound box of welding rods can cost more than \$150. An 8 foot 2 by 4 is now around \$4. With tight budgets, inflation at an all time high, and not a lot of start-up money coming from school systems, it is more important than ever that teachers are using their money wisely. What are some good, easy ways to help ease the pain of spending a lot of money for projects that provide meaningful experiences for students?

The first key to maximizing your budget is to **go out and meet people**. Put yourself out there in the community as a new teacher of agricultural mechanics. Make sure you make yourself and your students visible. Participate in community events such as the county fair, local festivals, and events with local businesses. Go on class field trips to see what businesses in your community are doing. One good example of this is that we had a class visit a local machine shop. They showed students how they were boring out an engine block, how to magnaflux a cylinder head to check for cracks and much more. Later in the year, the machine shop donated their time and resources to rework a tractor engine that was part of a class project.

Visit your local welding shops. They can provide you with a lot of good usable scrap metal. CMWA is a local business that makes wheels for Toyota. They save the ends of huge rolls of steel and donate them to our agriculture classes for practice welding. This saves an enormous amount of money!

**Have a good presence on social media.** Show everyone the projects and lessons going on in your program. If people see what you're doing, they're more likely to support you and your program. Don't be afraid to reach out through social media for help with support, whether with content or budgetary needs. The more consistent you post, the more people who will see what you are producing.

**Invite people to your shop.** We invite everyone to come see our students and share about their profession. We have invited a local artist to do a knife-forging



If people see what you're doing, they're more likely to support you and your program.

*All the students' final machines after we had stressed test each one in class.*

demonstration, a former student to share about his line-boring outfit, and a university student show students how to forge. Our state representative and senator have come in to see what we are working on. A local antique machinery club brings in old motors and tractors for students to see. Start by building a relationship with these people. Ask them to donate time first, which may later turn into financial support.

The most difficult part of teaching ag mechanics is giving your students real life, meaningful, industry-relevant activities. When a budget is tight, you have to be creative while keeping the standards in mind and making the project worthwhile. One example is a PVC plumbing project. The school's marching band used PVC in a production the previous year. They were going to throw away all the pipe. We bought a few fittings, cleaner and pipe cement. Our students made a simple ring out of PVC, with a garden hose fitting on one end. After they put the ring together, water pressure

was applied. Then the ring was checked for leaks. The whole project cost about \$30.

Another unit where you can be mindful of your budget is teaching simple household wiring. Students use a partial wall, made out of scrap lumber to wire in a few outlets, a switch, and a light fixture. With the exception of the cables and staples, almost all of the materials used are kept for the next year. We keep everything in a box and take apart everything at the end of the unit. After the initial cost of buying the receptacles, switches and light fixtures, it costs about \$40 to redo this project every year.

We utilized syringes donated by our local veterinarian for another project. After learning about the concepts of hydraulics, we bought some rubber tubing from the local hardware store for \$0.30 per foot. Students used the tubing and syringes as hydraulic cylinders and hoses. They used only what was in the scrap wood bin to build a machine that could pick up a cup of water. We even had competitions to see

who could pick up their cup the highest, move it the farthest or put the most weight in the cup. In total the project cost around \$12 and the syringes and tubing could be reused.

**Now for the big stuff.** You need to be able to make projects that are useful to your community, while also providing the means for teaching students the concepts and skills that are meeting industry standards. These projects need to be able to make your program enough money to operate throughout the year. I live in Paris, Kentucky, the self-proclaimed Thoroughbred capital of the world. The ag structures class builds small run-in sheds for horses. These sheds have a wooden frame that is on runners so they are moveable. The sheds are then covered in sheet metal that is custom ordered by color. Students in the welding class make and install metal brackets and hooks for each building as well. Every building is custom made for the buyer. Materials for these projects can be expensive. We make sure to market these wisely.

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*(LEFT) A larger group of students working on the different parts of the shed during the final moments of framing.*

*(RIGHT) Students standing in front of a completed shed that their group had been building.*

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One of the students working on cutting the ends on the runners for the shed project.

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We also keep close contact with our local extension office to make sure local farmers know the sheds are eligible for state cost share money. I require buyers to put down a nonrefundable deposit to cover all materials and ensure we will make a profit on each building. We also work to keep our total cost under that of most other local builders. We want to make money, but we're not building these sheds with the sole purpose of making money. The experiences and knowledge gained by our students is the most important aspect of or any project.

Bourbon County is also a big beef cattle producing area in Kentucky. The design and fabrication class builds metal feed bunks that we market to local cattle producers. Students follow plans to build heavy 12-foot long bunks. The floors of the feed bunks are made from the donated metal that comes from CMWA, which keeps costs down. These feed bunks are also cost share eligible. Buyers make



a down payment to cover the cost of materials on this project as well.

**Teaching agricultural mechanics can be one of the most rewarding areas for an ag teacher.** Keeping your head above water (financially) can be a pretty big chore. Make sure you establish good community partnerships that can help you and your students flourish. It's important to budget properly

and think outside the box to create easy, fun and cheap projects. Lastly, make sure you figure out your bread and butter, finding a big project or two that covers all areas of standards, is useful to the community and makes you some money.



*Andrew Fritsch has been an ag teacher at Bourbon County High School in Kentucky for 23 years.*



*Naythan Jewell is a first-year ag teacher at Scott County High School in Kentucky. He student taught with Mr. Fritsch in spring of 2024.*

# Data-Driven Agricultural Education: Mississippi's Approach to Work-Based Learning

by Justin Hall & Dr. Karen Cook

Over the past 25 years, the phrase “data driven” has permeated every aspect of the American education system, including Career and Technical Education (CTE). The Perkins V legislation mandates that state and local CTE programs collaborate with business and industry professionals to ensure students are prepared for high-demand jobs relevant to their communities. This federal requirement has significantly impacted how agricultural education is documented and reported in Mississippi.

Perkins V grants states flexibility in demonstrating the impact of their CTE programs. To provide a uniform measure across all CTE pathways lacking industry certification, the Mississippi Department of Education embedded a Work-Based Learning (WBL)

component into each career pathway program. Mississippi's WBL requirements, modeled after the Supervised Agricultural Experience (SAE), have been piloted in agriculture and health science programs, with potential expansion to other pathways.

Mississippi adopted the Agricultural Experience Tracker (AET) software as the data collection and industry evaluation tool for programs with embedded WBL requirements. To reach the highest level of WBL achievement, CTE students must:

- Document at least 35 hours of WBL experiences using AET's journal feature.
- Identify up to three skills per journal entry for evaluation.
- Be evaluated at least four times by external industry professionals.

While SAEs are familiar to agricultural educators, the mandated use of AET to demonstrate program im-

pact has raised the following concerns:

1. “Our programs offer valuable activities, but they don't fit in AET! How can I show my program's value?”
2. “AET is time-consuming! How can I get started and still have time to teach?”

Addressing these concerns begins with rethinking the three-circle model of agricultural education—classroom/laboratory instruction, SAEs, and FFA—as interconnected rather than distinct components. A common misconception is that SAEs must occur outside the classroom, leading some educators to feel they cannot implement SAEs effectively.

Many educators view AET solely as a record-keeping tool for SAE and FFA activities, rather than a comprehensive repository for all skills and experiences within agricultural education. High-quality classroom and laboratory activities that teach valuable skills should also be documented in AET as evidence of program effectiveness. The new SAE For All framework supports this interconnected approach.



“Consistency is key.”

*Students working in School Based Enterprise SAEs can document in their AET journals skills related to plant propagation, water and fertilizer management, pest management, and creating price lists for the annual plant sale.*



(LEFT) Students in the Veterinary Science course of the Houston Diversified Agriculture Program learned how to conduct CPR on stuffed animals in the Animal Care and Grooming unit. Students were able to journal about how to recognize an emergency health status, first aid techniques, and safety practices for small animals.

(RIGHT) Students in the Veterinary Science CDE team were practicing how to give shots to small animals as part of the practicum portion of the contest. Students were able to document in their AET journals about the skills related to safety precautions, veterinary pharmacology, restraint methods, and correct medicine dosage.

Agriculture programs across Mississippi are gradually embracing the idea that SAEs can occur both inside and outside the classroom. The Houston Diversified Agriculture Program exemplifies this approach, by following the SAE For All Framework, and successfully implementing AET documentation for all students over the course of one academic year.

Located at the Houston Career and Technology Education Center in Houston, Mississippi, the Houston Diversified Agriculture Program serves grades 8-12, with 120-130 high school students and 40-60 middle school FFA members. Courses include Principles of Agriscience, Animal Science, Food Science, Plant Science, Veterinary Science, and Capstone for Agriculture. Since 2007, the program has had an active FFA chapter. Producing over 25 Middle and High School state champion teams, nine National CDE teams,

nine state officers, countless state FFA degrees, and five state proficiency award winners.

Guiding and prompting students in the reflection and documentation process is essential, especially at first. Journaling about SAEs should be student-led, fostering discussions about enhancing their experiences. Educators may wonder what can be included in SAE journaling—everything done in and out of the classroom can be included. Here are examples from the Houston Diversified Agriculture Program:

#### **FFA Activities:**

- **Community Service Projects:** Students plan, implement, and evaluate projects benefiting the school or community. Journal entries can include communication, organization, and management skills.
- **CDE/LDE Skills:** Document specific skills taught during

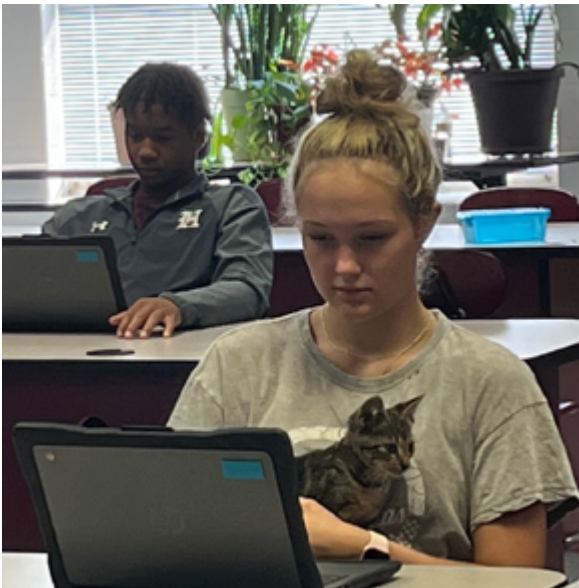
practices, such as proper debate in Parliamentary Procedure or kitchen/lab math conversions in Food Science.

- **Awards:** Journal about awards received and skills learned to achieve them.
- **Activities:** Reflect on skills learned at conferences, tours, and chapter meetings, such as active listening, teamwork, creative thinking, and speaking skills.

#### **SAE Activities:**

Activities that are completed to fulfill the Foundational level of the SAE For All framework are completed in class, and should be documented by students journaling about the experiences in AET. In addition to the activities in the SAE For All Independent Learning Guide, here are examples of simple assignments that can be used to fulfill the SAE For All requirements:





(TOP) Students have the opportunity to log their journal hours at least twice a week to make sure they do not forget a skill that they recently learned. Doing this helps train the students to be consistent and forms a daily habit. Eventually, these skills logged can lead to an Immersion SAE that can potentially help the students obtain their state FFA degree or a proficiency award.

(BOTTOM) A student in the Food Science course is conducting a caramel apple lab where the students had to determine the melting point of caramel and determine the time the caramel took to harden. The skills learned were food chemistry, product development, research, and utilizing the scientific method. All of these skills can be journaled to show understanding of competencies within the curriculum.



by a financial institution or extension partners.

### Classroom/Lab Activities:

- **Class Presentations:** Develop public speaking, research, and computer skills.
- **Content-Specific Skills:** Demonstrate and practice skills like animal restraint or giving injections, appropriate for reflection and documentation.
- **Experimental Research:** Conduct activities like determining the melting point of caramel or product development and testing, teaching research skills and the scientific method.

teacher will also train students how to complete journal entries. Many may give up on implementation during this process, but once the accounts are set up, the daily and weekly time commitment is significantly reduced to as little as 10-20 minutes a week.

Consistency is key—students at the Houston Diversified Agriculture Program log their hours twice a week, ensuring they don't forget activities and skills learned. Usually on Mondays, students log any hours completed from the previous Friday or the weekend. Then on Fridays, students log any hours completed from Monday through Thursday. As with all consistent classroom management practices, eventually students will develop a habit of journaling and logging their hours at the beginning of class on the specified days. In addition to the set days, the teacher can prompt students to log Foundational SAE and/or classroom activities either as a bellringer or exit ticket. This helps highlight to students the value of skills gained from in class activities and projects.

Another implementation tip is to start with your younger students—phasing in the use of SAE For All and/or the AET program over a two to four year period. These students will be more receptive to creating an SAE project(s) and journaling. Eventually, these younger students will have developed quality SAE projects as

- **Career Exploration:** Use the My Career Quiz on AgExplorer, select a career, and present it to the class.
- **Agricultural Literacy:** Research ingredients of favorite meals and create a poster showing their origins.
- **Employability Skills:** Practice through daily interactions and FFA activities.
- **Workplace Safety:** Pass a safety test or complete an OSHA-10 Certification program.
- **Personal Financial Management:** Participate in a “simulated life” scenario facilitated

– **Traditional Agriculture Activities:** Break down skills learned in welding, woodworking, and greenhouse work for easier journaling.

Implementing AET and journaling skills can feel daunting, but initial setup is the most time-consuming part. After completing the SAE unit of the curriculum, with a typical class, it can take up to three or four 50-minute class periods or two to three 90-minute blocks to set up student AET accounts, classes, résumés, and SAE projects within the system. During this time, the agriculture

they get closer to graduation that can be used for state degrees and proficiency awards. Essentially, the bulk of the time spent implementing the AET program is spent with the first year students. In consecutive years, students will just need to update their information at the start of the term and continue to add to their SAEs. Alternatively, the teacher may wish to implement AET journaling in all of their classes at once. While the teacher may experience minor push-back from their upperclassmen students, this approach allows the teacher to follow one lesson plan across all of their preps for the duration of the initial implementation stage.

Regardless of if an agriculture teacher chooses to implement journaling in AET all at once or gradually, it may help to create a fictional student account to show the students how to complete a standard journal entry. For the first few journaling sessions, the teacher may even wish to journal openly on the TV or projector to give students a visual of what is expected of them. Additionally, if an agriculture teacher has an upperclassmen student who is proficient in logging their hours, they may have that student cir-

culate the room as a teacher's aid during the journaling process. This can even be considered AET hours for the student who is training the class. Furthermore, if there is more than one agriculture teacher in the program, the classes can be combined the first few times the students use AET. This allows the teachers to work together as students begin developing their SAE, FFA, and classroom based experiences.

Lastly, to comply with Mississippi state WBL mandates, the Houston Diversified Agriculture Program requires 35 hours per student per class along with 1-3 skills learned per journaled activity. However, this does not mean a student should limit themselves to this. It is best to encourage students to go beyond the 35 journal hours to help with state degrees and proficiency awards. Furthermore, since Mississippi requires that students be externally evaluated on their SAE hours, it is best to limit the number of skills identified in the reflection. This will allow the reflection to be more concise and focused. This also helps the industry evaluator by keeping the time required per student to a manageable level.

In this age of accountability, the burden has been placed on us, agricultural educators, to justify the extreme value that our programs have to our students, our communities, and our local industries. The AET software may have originally been designed with solely SAEs and FFA activities in mind, but it has the potential to be a powerful tool for agricultural educators to provide data of their students' experiences to local, state, and federal agencies and stakeholders. However, to truly show a program's worth, we must change our mindset about what is appropriate to document and what types of activities can count as SAE and WBL opportunities. We must also understand that the most time consuming and difficult part of documentation is its initial implementation into our classes. Through the implementation of the SAE For All foundational framework and the realization that in-class activities can and should be documented as evidence of program effectiveness, we have the potential to provide a vivid and complete picture of our worth to industry and our students.



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# Experiences and Skill Development for the Preparation of Agriculture Teachers

by Dr. Farish Mulkey & Stacey Beacham

A quick survey of any of our at Abraham Baldwin Agricultural College (ABAC) agricultural education classes will reveal that each year more of our student population does not have much experience in production agriculture and even far fewer come from a production agriculture/farming family. The days of the statement, “I am unique because I don’t come from a farm” ought to now be replaced with, “I am unique because I have a farming or production background.” Certainly, many students in school-based agricultural education (SBAE) and thus, in agriculture teacher preparation programs have a demanding need for authentic agricultural and production

experiences. Nonetheless, National FFA has record membership of over 1,027,000 members, and locally within Georgia, there are 34 career pathways for our 80,000+ SBAE students to enroll. Added, the exponential rise in technology within the agricultural industry, college students’ lack of agricultural experiences should hardly be an issue. Yet there may be a stinging truth in the statement by Roberts and Robinson (2018), “Today’s college students know very little about agriculture” (p.256). Who is responsible for changing this phenomenon? All of us!

The rapid growth of elementary agriculture and middle school programs has resulted in enrollment numbers that rival

those of high school programs. Agricultural education is also growing in urban high schools and teacher education programs must step up their game in that aspect. Preservice teachers encounter additional pressure to balance foundational elements of agricultural knowledge and practical skill development while meeting new opportunities in agricultural education. They must also meet demands from the state level for science, reading, special needs; all while delivering in a 120-hour degree program.

As a school-based agricultural educator of 30 years and now a teacher educator at ABAC, I get to pass on nuggets of wisdom to our pre-service teachers from time

*(LEFT) Retired Ag Teacher, now full-time producer, - Ira Tucker teaches students the skill of knowing when peanuts are ready to be harvested.*

*(MIDDLE) Preservice teachers learn how irrigation is controlled through satellite technology and phone-based apps from a producer.*

*(RIGHT) What and how to control - capturing knowledge and running a center pivot irrigation.*





*(LEFT) Future teachers provide baby pig care as part of their teacher preparation through a partnership with K&H Show Pigs - Reggie Gibbs.*

*(RIGHT) Preservice teachers attend a field-day demonstration on pre-emergence and post emergence of a sweet corn crop.*

to time as the need arises. I recall a former principal constantly reminding the faculty that all parents were sending the best students they had to us, and they were not keeping all the good ones at home. I share this with pre-service teachers to remind them that every student entering their classroom may have a different enthusiasm for agriculture. The teacher's role is to light the fire, fan the flame, and make a positive difference in students' lives. In my five years at ABAC, I have learned that even our Agricultural Education students bring various agricultural skill levels to college. In essence, we are getting the best students possible, and it is up to our teacher preparation program to continue providing them with engaging experiences from the time they set foot on campus until they graduate and beyond. By providing these opportunities to gain new skills, we create a solid foundation for them to build on to learn how to teach more effectively.

How do we better prepare our students for the classroom, given that gaining agriculturally related experiences and developing those associated skills becomes more challenging for many young people to acquire? Fortunately for the students in the School of Agriculture and Natural

Resources at ABAC, almost every agriculture class has a lab section incorporating hands-on learning activities. The Agricultural Education program began in 2017 with simulated activities and engaging experiences as the cornerstones for each course taught within the department and has quickly grown into a top tier program in the nation. Traditionally, Junior and Senior years provide students with many opportunities to work with area teachers with Career Development Events (CDEs) on the regional and state levels, assisting with state livestock shows, evaluating Agriscience Fair projects, interviewing proficiency finalists, and gaining experiences that enhance the transition from an FFA member to an FFA advisor.

The agricultural education department at ABAC, demonstrating its proactive approach, has seen the need for additional experiences for first and second-year students. We heard the requests from our students and cooperating teachers, and intentionally met those needs. We realize that immersing these students in agricultural experiences will not make them experts in a particular subject area, which is not our goal. We believe that exposure to the sights, sounds, smells, and opportunities to gain

hands-on experiences will develop self-efficacy for our pre-service teachers as they prepare for the classroom.

Our department began the experiential process by drawing from the current faculty's 50-plus years of SBAE experience. The second step targeted our advisory council of state staff members and cooperating teachers for their expertise as we developed our sophomore-level course AGED 2290 - Experiential Learning. We asked, "What should a new ABAC ag teacher be able to do?" These experts, representing a diverse range of agricultural education, responded with excellent feedback for a course that aims to provide students with opportunities for experiences and to gain/develop skills. As a result of their suggestions, the current semester-long class includes the following activities:

- visiting a show pig operation where students have the chance to process litters of pigs, discuss swine production practices and swine projects, farm safety and identification of potential hazards
- visiting a school livestock SAE facility which included learning how to check/read tattoos, registration papers, ear notches, movement around livestock
- loading a trailer, preparing for livestock shows, supervising students and projects
- safe tractor and zero-turn mower operations



(LEFT) A high school agriculture teacher (Justin Martin - Tift County High School in Georgia) works with preservice teachers to identify ear tattoos in cattle.  
 (MIDDLE) Aspiring agriculture teachers learn zero-turn mower operation and safety as part of their teacher preparation program to learn skills and prepare their future students.  
 (RIGHT) Even a little fun can be had while learning new skills as a cone gets ran over!

- plant propagation and creation of hanging baskets
- using a GPS
- identification of wildlife using skulls, feathers, bones, furs, and tracks, and aging deer using jawbones,
- proper procedures when pulling and backing trailers
- estimating the area of a parcel of land, reading a compass, and calculating the cord volume of pines using a clinometer, a diameter tape, and a logger's tape vs. using a Biltmore stick
- completing a mini Meats Evaluation CDE and conducting a lab to compare steaks from each of the primal cuts
- visiting a canning plant and preparing potatoes for canning and participating in all steps of processing
- visiting a peanut producer and learning how producers determine the proper time for digging peanuts and seeing how

peanuts are inverted and prepared for harvest, and seeing the latest agricultural technologies used in the production of food and fiber products.

Each of these field trips and labs utilized the expertise of crop and livestock producers, area teachers specializing in forestry, natural resources, and agricultural mechanics, current high school agricultural educators, and ABAC faculty. Students were required to submit reflections on what was learned from the experience, whether there were further questions, and how the skills/knowledge gained from these experiences would be beneficial when they entered the classroom.

Course evaluations for each semester that AGED 2290—Experiential Learning was offered has been positive. As we reflected on each semester, it was apparent that the experiences were what the second-year students were seeking. At this stage in their educational journey, many students realize the need to gain new skills

through experiences. However, we have found that preservice teachers have difficulty thinking about how to teach a skill as they are learning newly acquired skills-based experiences. These discoveries have been foundational in creating two new courses that will provide our students with new experiences as they prepare for teaching in lab settings and supervising student projects.

Georgia Agriculture Education State Staff, continue to work with these apprentice teachers along with the teacher preparation program at ABAC. From an Advisory Council for the Agriculture Education standpoint, the program takes to heart what teachers and state staff provide to direct the program. As a result, ABAC has offered more relevant educational experiences that not only informs students on professional needs but puts the students in front of activities they will encounter as they are teaching SBAE. The Advisory Council, which meets twice a year, is made up of master teachers from across the state

that provide their level of expertise in the classroom by sharing insight from their classroom with the council, hosting students in the program to showcase their individual programs and by serving as supervising teachers to the senior students. The Advisory Council meetings are an opportunity for the ABAC professors to present and discuss student and program data, course listings and student experience opportunities that are part of the program. The council members are also given the opportunity to share feedback and offer ways to add to and improve the program.

The South Region Agricultural Education Office is located on the campus of ABAC. As such, there is direct access to the students in the teacher education program. Each year, staff are invited to speak to the classes about various aspects of Agricultural Education. Bringing in these state staff members adds another layer of validity to the instruction already given by the Ag Ed professors. Often, my staff are asked to provide more than just information but hands-on activities in “real class” situations for the “show me how” aspect of the courses. Situations and events such as livestock eval-

uation, Agriculture Mechanics and plant sales, that many if not all Ag programs have, are offered. These workshops serve dual purposes: they provide technical knowledge and equip future educators with the skills necessary to effectively teach these concepts when they have their own classrooms. The program continues to add opportunities that would allow them to be better informed and more “marketable” teachers. Utilization of the state staff helps to build confidence in these students as they begin their teaching career. They do not have to be isolated in their classroom. They do have advocates that desire to help.

Additionally, state staff are responsible for preparing and facilitating FFA CDEs and LDEs both on the region and state level. Through the regional staff partnerships, students are encouraged to come alongside as competitive events are set up and conducted. Students serve as group leaders, providing information and assistance to the students during the event. Students also serve as judges for events such as public speaking and various applications. Preservice teacher roles are crucial for the success of events, as they provide valuable behind-the-scenes expe-

riences that will equip them with the skills necessary to prepare their own students effectively.

The more we can get future teachers away from their student desks and behind the teacher desk, the more confident and prepared they will be as they begin their apprenticeship with a master teacher. It should be the goal of college and university programs to develop more teachers but to also develop future teachers that have a desire to learn new skills to become master teachers. Thinking about the total preparation program for future master teachers extends far beyond the methods and curricular development courses and beyond the theories and philosophies. First-hand experience is vital.

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# Learning by Doing: Engaging in Project-focused Professional Development

by Dr. Trent Wells, Dr. Steven “Boot” Chumbley, & Dr. Will Bird

**B**y our profession’s very nature, agriculture teachers routinely engage in hands-on teaching and learning experiences. From teaching students how to transplant young plants in a greenhouse to guiding students on learning a new welding process in an agricultural mechanics laboratory, agriculture teachers frequently facilitate hands-on technical agriculture skill instruction across numerous agricultural subject matter areas (Solomonson et al., 2022; Wells et al., 2023). These individual agricultural subject matter areas include agricultural mechanics, animal science, plant science, natural resources, and more. Consequently, agriculture teachers themselves must be knowledgeable and skilled in these areas (Wells et al., 2024), particularly when preparing to immerse students in rigorous, challenging topics beyond “the basics.”

Agriculture teachers (especially those beginning their careers) often need additional professional development (PD) in technical agriculture subject matter. However, there can be quite a bit of variance in individual agriculture teachers’ PD needs. For example, beginning agriculture teachers may need PD across a broad scope of topics while more experienced agriculture teachers’ PD needs may be fewer in comparison to beginning teachers but are likely more precisely-defined (Hainline & Wells, 2024). This is typically expected due to such individuals

An individual agriculture teacher’s approach to their own PD should be driven by their own needs, their students’ needs and interests, and their local community’s needs.

having invested a greater number of years teaching agriculture than their less-experienced counterparts. An excellent example of this phenomenon can be found in agricultural mechanics. Beginning agriculture teachers may be more likely engage in PD that is more focused on the “fundamentals” of a certain topic, such as learning how to perform routine procedures related to shielded metal arc welding (SMAW) so that they can facilitate “beginner-level” skill instruction for their students, while experienced agriculture teachers may be more willing to seek out PD designed to expand and deepen their knowledge and skill sets in a more applied and comprehensive manner, such as through participating in a trailer fabrication workshop.

An individual agriculture teacher’s approach to their own PD should be driven by their own needs, their students’ needs and interests, and their local community’s needs. We as agricultural teacher educators desire to see all agriculture teachers push past their own limits and become better-prepared to teach the technical agriculture skills that

they themselves may not be comfortable with at the moment. While “fundamentals”-oriented PD workshops are certainly beneficial (we have each attended and/or offered several such PD workshops throughout our careers), we would like to provide some insights and ideas regarding project-focused PD that may serve to help all agriculture teachers (regardless of experience level) to push themselves further professionally. For the record, we chose to explicitly focus only on PD topics in which we are particularly familiar. We felt that doing so would help us to provide more practical, useful input to our target audience.

## Agricultural Mechanics

Agricultural mechanics is perhaps the easiest technical agriculture subject matter area in which to highlight project-focused PD workshop programming. There exist numerous examples of project-focused workshops that address multiple content areas within agricultural mechanics, such as metal fabrication and power mechanics. Regarding metal fabrication, perhaps the most commonly-offered project-focused workshops are trailer fabrication

workshops. We have each both participated in and facilitated trailer fabrication workshops and we can attest to the numerous knowledge and skill sets agriculture teachers glean from participating in such experiences.

Within trailer fabrication workshops, agriculture teachers typically work in teams (and under the close supervision of experienced facilitators, such as retired agriculture teachers) to perform a variety of tasks related to large metal projects, such as: (1) interpreting project plans, (2) laying out the trailer project, (3) using both familiar and unfamiliar tools and equipment to prepare carefully-sized metal parts, (4) employing a variety of welding and metal fabrication processes (e.g., gas metal arc welding [GMAW], oxy-fuel cutting, plasma cutting, etc.) to fabricate the trailer project, (5) applying mathematics concepts and engineering principles, (6) wiring the trailer project, and (7) troubleshooting issues as they arise and learning to cooperatively arrive at solutions. These workshops typically occur over a three- to five-day time frame (depending on the complexity of the trailer project) and yield a completed, road-ready final product. Our experiences with trailer fabrication workshops have led us to conclude that agriculture teachers of all experience levels:

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*(TOP) Problem-solving is a common aspect of building large projects. Agriculture teachers must appropriately strategize how to perform challenging tasks when participating in trailer fabrication workshops.*

*(BOTTOM) Trailer fabrication workshops provide agriculture teachers with numerous opportunities to apply a combination of technical skills and team-building exercises to successfully complete large projects. Well done projects are a source of pride for agriculture teachers.*

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(1) benefit from the intermingling that occurs within their teams, (2) enjoy the hands-on, “real-life” aspects of this type of PD workshop, and (3) appreciate the ability to problem-solve and think as students would about successfully completing a large project in a limited time frame.

Within the context of power mechanics, Briggs and Stratton Instructor Field Schools are another example of a project-focused PD workshop. The

project associated with these PD workshops is a small gas engine shared between small teams of agriculture teachers (typically two or three teachers per team). This project involves the gradual tearing-down and re-building of a single-cylinder, four-stroke engine while learning the “fundamentals” associated with such engines (e.g., four-stroke engine theory, carburetor theory, engine troubleshooting, etc.). This workshop takes place over three days (typically Tuesday through





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*Attention to detail is important when working with small gas engines. Within Briggs and Stratton Instructor Field Schools, participants must pay close attention to even the smallest things when re-building their four-stroke engine projects.*

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Thursday of a given week). At the beginning of each Briggs and Stratton Instructor Field School, agriculture teachers are provided with an extensive set of curriculum resources, such as a laboratory guide, a textbook, a workbook, and a variety of specialty tools, to take back to their respective agricultural education programs.

In contrast to the above-mentioned trailer fabrication workshops, there is a little more “seat time” associated with the Briggs and Stratton Instructor Field Schools. However, we have found that increased “seat time” when facilitating small gas engines-oriented workshops is quite useful for helping to keep every agriculture teacher “on the same page” when addressing highly-technical topics. Moreover, the Briggs and Stratton Instructor Field Schools incorporate several concept demonstration sessions, such as a Reid vapor pressure test, a “clear” carburetor function demonstration, and a gasohol test. Each Briggs and Stratton Instructor Field School is facilitated by an industry expert who works with a wide range of clientele who engage with outdoor power equipment, such as dealerships and their respective service technicians. Our experiences hosting Briggs and Stratton Instructor Field Schools have been overwhelming positive and we have

noted that agriculture teachers: (1) appreciate the “intimate” feel of the workshops as a result of working closely with partners to complete the multi-day small gas engines project, (2) enjoy the opportunity to directly engage with an industry trainer and build a relationship with them, and (3) easily incorporate their newly-obtained curriculum resources into their small gas engines instruction throughout the following academic year.

### **Animal Science**

Similar to agricultural mechanics, animal science is quite broad and encompasses a variety of areas, such as livestock production, veterinary science, and animal biotechnology. Unlike agricultural mechanics, though, it can sometimes be a little more difficult to immediately identify project-focused PD workshops aimed at agriculture teachers. However, that does not mean that such opportunities do not exist or are not worth undertaking. Specific examples of project-focused PD opportunities include: (1) leading agriculture teachers through constructing low-cost animal body system models (e.g., reproductive tracts, digestive systems, etc.) to support animal science instruction and (2) leading agriculture teachers through the process of creating budget-friendly

veterinary clinic skills simulation models (e.g., castration models, cattle palpation models). These types of PD workshops could be (and likely already are) offered at agriculture teachers’ conferences across the country and can be facilitated at reasonable costs of both time and resources.

On the other end of the animal science spectrum, there exists the opportunity to blend PD in both agricultural mechanics and animal science through an innovative, project-focused approach. In particular, this concept involves identifying an agricultural education program seeking to expand (or even build) school farm facilities (e.g., livestock barns, chicken coops, etc.) and bringing agriculture teachers together at a specific site to plan and construct said facilities. However, we caution that while this type of project-focused PD workshop would likely be beneficial to participating agriculture teachers and the recipient agricultural education program(s), care must be taken to ensure that facilities receive appropriate approvals and input from school administrators or officials prior to any construction taking place.

### **Natural Resources**

As a technical agriculture subject matter area, instruction in natural resources can

**Table 1. Additional Examples of (and Ideas for) Project-focused PD for Agriculture Teachers**

<i>Agricultural Mechanics</i>	<i>Animal Science</i>	<i>Natural Resources</i>	<i>Plant Science</i>
Adirondack Chair Construction	Animal Body Systems Model Construction	Forest Management	Crop Irrigation System Design / Construction
Briggs and Stratton Instructor Field School	School Farm Facility Design / Construction	Water Quality Management	Floral Arrangement / Design
Electrical System Wiring	Veterinary Clinical Skills Simulation Model Construction	Wildlife Management	Greenhouse Design / Construction / Management
Grill / Smoker Fabrication			Landscape Design / Management
Storage Building Construction			
Tool / Equipment / Facility Restoration and Repair			
Tractor Repair / Service / Restoration			
Trailer Fabrication			

encompass myriad topics, such as forestry, water quality management, and wildlife science. Regarding wildlife science, federal funds have been used over the past several years to facilitate the Wildlife Education and Sustainability Training (WEST) program in South Texas. Dr. Steven “Boot” Chumbley (an author of this article) has used this project-focused PD workshop to provide agriculture teachers with multi-day training in wildlife management on a large, privately-owned wildlife center near Kingsville, Texas. The topics addressed in the WEST program include: (1) wildlife trapping, (2) population assessment, and (3) habitat management. Further, agriculture teachers received exposure to both the Project WILD curriculum and the Aquatic WILD curriculum and completed a variety of project-focused activities within each. Throughout this experience, agriculture teachers were responsible for gathering data to help the local wildlife center personnel make

management decisions, which was the larger project being addressed within the scope of the PD workshop experience.

**Additional Example of (and Ideas for) Project-focused PD for Agriculture Teachers**

To provide an easy-to-use visual, we created a table outlining some of the ideas and concepts we previously described (see Table 1). We recognize that while some examples or ideas may be more relevant than others due to various local factors, we hope these ideas will be meaningful and useful to other agricultural education professionals.

We encourage agricultural education stakeholders (e.g., other agricultural teacher educators, experienced agriculture teachers, state staff, etc.) across the country to serve their constituency by helping to facilitate more advanced, project-focused PD workshops that help agriculture teachers in their respective states to grow both professionally and personally. We believe that doing

so will help to positively impact agriculture teachers’ competence and confidence teaching technical agriculture subject matter and, consequently, help them improve their respective students’ educational outcomes.

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# Skills for College-Age through International Learning: Traveling Tigers!

by Dr. Lana Petrie, Dr. John Ricketts, & Brian Kibirige

## Introduction

Studying abroad can be a life-changing experience for students by expanding their career options and providing invaluable skills and experiences. Through the NEXTGeneration Inclusion Consortium (NIC) Project, students from Tennessee State University had the opportunity to participate in international programs focusing on various agricultural sectors in countries such as Senegal, Kenya, England, and Japan. As agricultural educators, we play an important role in shaping future agricultural professionals by providing opportunities for students to study abroad. The skills acquired through the programs provided are excellent for academic and personal development, preparing students to excel in diverse settings and make meaningful contributions to the agricultural sector.

## Senegal

In partnership with Virginia Tech (VT) and with support from a five-year grant from the U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA), TSU students tackled food safety, health, and preservation challenges in Senegal. This collaborative effort, backed by the NIC Project, is now in its fourth year to expand the number of extension agents in agriculture.

In May 2024, four TSU and seven VT undergraduate students

embarked on a trip to Senegal to provide training to local community members—the training program aimed to impart essential food preservation techniques for improving food security and minimizing food wastage specifically with mangos and tomatoes. By equipping locals with the knowledge to manage and preserve food resources efficiently, the project seeks to enhance the stability and sustainability of the local food supply. The training covered how to can and preserve mango salsa and tomatoes. This initiative directly benefits the well-being of the communities by reducing food spoilage and ensuring a greater availability of safe, nutritious food.

*“My eye-opening time in Senegal has truly changed my perspective for the better. Immersing myself in such a rich culture and nurturing educational environment has empowered me to become a more resilient leader and has*

*taught me invaluable lessons about life’s true priorities.” - Aaliyah Cotton*

## Kenya

Two graduate students from TSU undertook an enriching learning experience by participating in two-month internships that focused on separate research projects. The projects were conducted in collaboration with the Biosciences Eastern and Central Africa International Livestock Research Institute (BecA)-ILRI Hub and South-eastern Kenya University (SEKU), and the NIC Project. They provided the students access to state-of-the-art research facilities and expert guidance. The first project, *Surveying Antimicrobial Resistance in Kenyan Poultry Farms with a Focus on Shigella Spp.* aimed to assess the prevalence and impact of antimicrobial resistance in poultry farms throughout Kenya. The second project *Investigating Productivity and Herd Dynamics as well as Land Use Management in Mixed and Dry-*



*TSU students Aayliyah Cotton and Kennedy Bentley working with Senegalese women on tomato preservation training.*

land Systems of Kenya delved into agricultural practices within diverse agriculture environments.

In addition to the graduate internships, the NIC Project organized a study abroad program for three undergraduate students. This two-week program was to complement the themes and locations of the graduate internships, offering the undergraduates a comprehensive insight into agricultural practices and challenges in Kenya. The collaboration provided a multidisciplinary approach to learning as students, staff, and faculty shared insights and observations from their respective research and study experiences. The group toured various agricultural sites, engaged with local farmers, and deliberated on strategies to tackle the challenges faced by the farming sector in Kenya.

*"Going to Kenya was an experience of a lifetime and filled with moments that one cannot explain but only experience." - Kaylin Hughes*

*"I feel extremely blessed to have been part of this project and experience. Kenya is a beautiful country and the people are so kind. I love how green it is and all the different animals we saw. This experience enhanced my love for agricultural sciences. I hope to be back in the future with my family or as a scientist." - Alondrah Santana*

### England

Five TSU students participated in an immersive textile study abroad program in London, England. This program is specifically designed to explore areas of agriculture in textile sustainability, supply chain dynamics, and the global fiber market. By visiting top fashion stores, textile manufacturers, and retail leaders, students gained skills and invaluable experiences in agriculture from the fashion and product development sectors. Emphasizing sustainable practices and ethical sourcing, the NIC Project ensures students can make informed decisions in their future careers as future agriculture professionals.

*"Extremely grateful for the opportunities God has set before me, allowing me to experience things most people dream of. I take nothing for granted and I will grow from these opportunities that are shaping me for the future." - Brighton Gillum*

*"A Life-Changing Journey that Earns a 10/10!" - Mariah Nicholson*

### Japan

During their time in Japan, three TSU students had the opportunity to gain practical, hands-on experiences in research laboratories and visit agricultural farms to learn about innovative agricultural practices. Industry tours of The Calbee Potato Industry and The Meiji Dairy Industry were incorporated for students to experience agriculture operations in Japan, providing valuable insight into agricultural production and processing. To offer a richer cultural experience, the itinerary included visits to places like the Tokyo Waterworks Histor-

(LEFT) TSU graduate student Alondrah Santana feeding a giraffe in Nairobi.

(MIDDLE) TSU students in London learning how agriculture and product development are intertwined.

(RIGHT) TSU students Jada Wilder, Jacarys Braxton, and Gianna Pearson exploring Japan.



ical Museum and JAL Agriport. The trip provided students with an unforgettable experience by integrating hands-on training, industry insights, and global exposure in Japan.

*“Overall, this was an amazing experience, and I enjoyed my time in both the countryside which was in Hokkaido and the city which was Tokyo. I learned a little bit more about Japan’s agriculture which was interesting especially because my concentration is in Fashion Merchandising, so it was refreshing to see something new and different to me. I think my favorite part while being in Hokkaido was going to this place called Mugoto Masuyu and we made homemade wheat flour pizzas which were amazing. We also toured their wheat farm*

*area on the side of the building which was also cool. I also enjoyed going to the botanical gardens on our free time. While in Tokyo, my favorite part was going to Shibuya and Disneyland Tokyo. Overall, I enjoyed my trip, and I am grateful for the opportunity.”*  
- Gianna Pearson

### Conclusion

TSU NIC Project study abroad programs have provided students with immersive learning experiences, effectively integrating academic knowledge with practical, real-world applications. These international experiences have broadened students’ perspectives on agriculture and enhanced their cultural competency skills. Whether addressing food safety issues in Senegal, exploring antimicrobial resistance in Kenya, delving into textile sustainability

in London, or gaining hands-on agricultural training in Japan, TSU students are being prepared to emerge as well-informed, globally aware professionals. These experiences are shaping the next generation of leaders in agriculture, equipping them with the knowledge and skills to tackle the complex challenges of our interconnected world.

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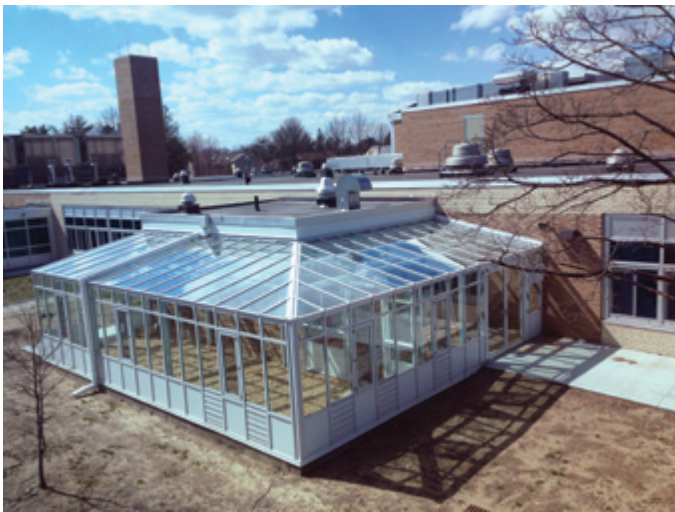
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