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College and Career Readiness

Start Them Young! Building Capacity for College and Career Readiness

by Dr. Gaea Hock

I spend most of my time with either college students or my own children. There are similarities between the two groups. They both like to laugh, play, learn, and explore. They both find me either demanding, annoying, caring, or supportive depending on the situation. They are also both working to develop skills and knowledge to prepare for their next phase of life.

When I consider how I am working with both groups to set them up for success in their educational and career journeys, I hope they look back and recognize the extra effort I spent preparing them for their futures.

It is more work to bring students (and children) along for high impact learning opportunities. But those experiences are the ones they will remember and be able to recall years from now. As a parent, I take my children to events and locations that will enable them to experience new and novel ideas. As a college professor, I work to get my students out of the classroom through activities and experiences that will grow their capacity as future educators. My task of training future teachers to help their own students prepare for college and/or career is on my mind when I incorporate guest speakers, tours, and assignments into my courses.

Each spring I lead our student teacher cohort through two experiences to broaden their exposure to the agriculture industry. One of them is focused on corn while the other is on soybeans. During each experience, they hear from industry personnel about the careers available and skills they are looking for in their employees. This exposure allows future teachers to better understand and connect their coursework to their student's future career and education preparation needs.

KSU student teaching interns take part in high impact learning opportunities each spring with a focus on the corn and soybean industries in our state. Students learned about biodiesel while touring a laboratory at University of Kansas.

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In addition to the industry stops, I also incorporate educational locations. This stop may be formal or nonformal, but the goal is the same; help my future educators connect with current professionals. Through this con-

(LEFT) My daughter enjoyed learning about a variety of careers at the Kansas Science Festival held in Manhattan, Kansas in April 2023.
(RIGHT) My son, Jasper, was able to learn through play during the Kansas Science Festival. This early exposure to engineering design may entice him to explore a career in the field later in his life.

nection, they can ask questions, gather ideas, and grow their capacity to positively impact their own students.

One of the stops on our corn tour this past spring was to McPherson High School. The agriculture teacher there, Mr. Dean Brown, has been working to prepare future welders in partnership with an area technical school for many years (see back cover picture). These formal experiences are more unique in my state, but they exist at various levels across the county and world.

How are you helping prepare students to be college and/or career ready? What are you doing to make students aware of their opportunities beyond the classroom? The articles in this issue offer advice and share experiences on this important topic. As you read, consider all the ways you are already exposing and preparing your students (or children) for their next phase of life. You are probably doing more than you realize! (Remember to also promote agricultural education as a career!) Keep doing what you can and add in key elements to help them prepare for the future. You are key in developing their capacity!

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Front Cover Photo Courtesy of National FFA Organization
Back Cover Photos Courtesy of Dr. Gaea Hock

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Why College and Career Readiness?

by Dr. Brooke Thiel

College and Career Readiness. Though you've likely heard the buzzwords before, what does it truly mean to prepare students for college **and** career? What does it really mean to be "ready?" As an Agricultural Education teacher, I pondered this question often. How do I, a secondary Career and Technical Education teacher, prepare my students for their future careers? How do I do that when those careers are changing faster than I can develop new curriculum?! All the while, I was working in a school system that seemed more concerned with funneling high-achieving students into AP, dual-credit coursework at the expense of our Ag Ed courses (in addition to art, music, and other CTE electives).

When I first started to understand what was meant by "college and career readiness," I staunchly believed career readiness was more important than college readiness. The Association of Career and Technical Education (ACTE, 2010) defines career readiness as having the academic, technical, and employability skills needed to pursue a career. It's important to note that our students do need to attain the academic skills necessary to work in their future careers. Those skills may be reading a technical manual, balancing a budget, or calculating the amount of antibiotics needed for a pet. Our students *do* need to gain academic skills during high school, and in many cases, they can develop those skills in our classrooms. When we integrate academic standards into our Ag Ed classes, students see the connection of what they learn in their English, math, and science classes to the real-world! The application of those skills into real-life is impactful and meaningful. When applicable, find ways to weave academic standards into your Ag Ed coursework to foster career readiness.

Education is rapidly changing in our country. In 1973, only 28% of jobs required some amount of post-secondary training or certification. Today, that number exceeds 65% (Carnevale et al., 2016). Also, employees who had some form of post-secondary education earned an average of 74% more than workers with a high school diploma or less. It is becoming increasingly difficult, if not nearly impossible, to achieve a middle-class career without some post-secondary schooling. To be fair, I'm not suggesting all students must earn a 4-year degree, but we do have an obligation to ensure our students have the academic skills needed to achieve the career path they pursue. From that perspective, it is important they are college-ready for whatever post-secondary path they choose.

As far as technical skills, hands-on and experiential Ag Ed coursework allows students to develop the technical skills they need for a wide-range of agricultural careers. *This* is something Ag Ed has been doing exceptionally well for years. In my opinion, the jury is still out regarding the best ways to foster employability skills among our students (we don't have a ton of empirical evidence related to teaching and

Career readiness, as defined by the Association of Career and Technical Education (ACTE), includes a combination of academic skills, technical skills, and employability skills.

> ...hands-on and experiential Ag Ed coursework allows students to develop the technical skills they need for a wide-range of agricultural careers.

assessing these skills), but I would argue that anecdotally, we all have stories of how Ag Education, FFA, and SAE have helped students develop communication, leadership, critical thinking, and other employability skills; and the research regarding the impact of agricultural education on the development of these skills is promising. Certainly, it is our hope that the expansion of SAE to SAE for All will help ensure positive career development opportunities for all students, especially in terms of developing employability and career readiness skills.

As I reflect upon the purpose and value of agricultural education, I am continually reminded of the more than 59,400 agricultural jobs available every year and the shortage of graduates to fill those open positions (Fernandez et al., 2020). The agricultural industry needs our students (and beyond) to find their niche in agriculture. Though I have taught future speech pathologists, engineers, elementary teachers, nurses, and graphic designers who do not work in the agricultural industry, I do still believe it is our purpose to expose students to various career opportunities they may not know exist. As many young adults with an affinity for science and a passion for agriculture, I started my career journey as a pre-vet student at NDSU. It wasn't until I got to campus that I realized how many other careers existed in the livestock industry that had nothing to do with veterinary medicine. I didn't know I could be a USDA meat inspector, ruminant nutritionist, embryologist, or AI technician. Ag teachers: you know your students better than most adults in the school system. Identify the skills, interests, and abilities that make your students unique and encourage them to look into careers in agriculture they may not have thought about. Be the mentor your students need by helping them hone their skills and make sound career decisions; or, find them a mentor that can provide the insight and perspective they need. Trust me - I have never seen a kindergartner with a first day of school sign that says "when I grow up I want to be a plant pathologist!" We need *agricultural education* to identify, support, and train the next generations of plant pathologists, global export managers, extension educators, and beyond!

My hope is that this issue provides you with some ideas and validation that the work you're doing through Agricultural Education *matters*, and it is preparing your students for their future careers regardless of the pathway they choose. Keep fighting the good fight and do not lose sight of the impact you make in your students' lives as they pursue their dreams and goals.

References

Association for Career and Technical Education [ACTE]. (2010). What is "career ready?" https://www.acteonline.org/wp-content/uploads/2018/03/Career_Readiness_Paper_COLOR.pdf

Carnevale, A. P., Smith, N., & Strohl, J. (2013). Recovery: Projections of jobs and education requirements through 2020. Georgetown University Center on Education and the Workforce. https://1gyhoq479ufd3yna29x7ubjn-wpengine.netdna-ssl.com/wp-content/uploads/2014/11/Recovery2020.FR_.Web_.pdf

Fernandez, J. M., Goecker, A. D., Smith, E., Moran, E. R., & Wilson, C. A. (2020). Employment opportunities for college graduates in Food, Agriculture, Renewable Natural Resources, and the Environment: United States, 2020-2025. Purdue University. https://www.purdue.edu/usda/employment/

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SAE: The Original College and Career Pathway

by Breanna Pastir & Dr. Brooke Thiel

> Successful youth will be confident in their ability to navigate the world of work throughout their lifetimes.

Back to the Beginning: SAE in the Early 20th Century

Home-School Cooperation Plan, Farming Project, Productive Farm Enterprises, Supervised Farm Practice Program, Supervised Farming, Supervised Occupational Experience Program (SOEP), Supervised Agricultural Experience (SAE), and SAE for All. All of these are different titles that have been given to project-based learning in agricultural education over the years. Though the name has changed several times, the concept of project-based learning in agricultural education has been around for more than 100 years.

In 1908, Rufus Stimson was appointed the first director of the brand-new Smith Agricultural School in Northampton, Massachusetts. At the time, agricultural education consisted mainly of lecture and recitation, as well as some labor on the school's farm. Stimson was frustrated because he believed vocational agriculture students spent more time observing others' work than working themselves (Stimson, 1920). Seeking a more ideal learning environment, Stimson introduced a new method at Smith Agricultural School called the project method where students applied classroom knowledge by working on their home farm operations. Because 34% of the U.S. population lived on farms at the time, Stimson's project method was a reasonable request that led to high engagement in experiential learning on students' farms or neighboring farms (the first entrepreneurship and placement SAEs!). The project method was also well-aligned with the goal of vocational agriculture, which was to produce skilled workers. Preparing students with the skills to work as a farmer was critical since 31% of the U.S. labor force worked as farmers or farm laborers at the time (Moore, 1988).

SAE Today

Though once a robust, central component of agricultural education, SAE involvement has been in a steady decline for years. In 2008, it was estimated only 30% of students in agriculture education were engaged in SAEs. With fewer than 2% of Americans living on farms or ranches (American Farm Bureau, 2023), the demographics of students who enroll in agricultural education today are vastly different from the students who participated in 1908.

As former agricultural educators, we struggled with introducing Supervised Agricultural Experiences (SAEs) to our beginning 7th, 8th and 9th grade students and engaging all of our students in SAEs throughout their time in the Ag Ed program. We're sure you can all relate to the challenges teachers report facing when trying to implement SAEs into their programs: limited placement or job opportunities, fewer students coming from production agriculture backgrounds, lack of time (from both teachers and students/families) and resources, among many others. As agricultural educators, we *know* all students should have an SAE. We *know* students gain valuable skills from their SAEs. But, most of us also agree that 100% engagement in *meaningful* SAE is impossible when those SAEs are done the same way as they were in 1908. What if there was a way to make SAE attainable for *all* of our students? What if there was a way to remove barriers, overcome challenges, and reduce inequities in our delivery of this critical component of the three-circle model? What if we told you that SAE for All has the potential to create a pathway for 100% involvement in *meaningful* SAE?

Understanding of the SAE for All framework ranges across the country. After the National Council for Agricultural Education realized SAE needed a change, they formed a renewal committee in 2008 to revise SAE for modern agricultural education. SAE for All was launched in 2015 by the committee, followed by the release of resources and implementation guides in 2017. Regional Train the Trainer workshops took place in 2019 with the goal of rolling out SAE for All trainings across the nation in 2019 and 2020. Unfortunately, COVID-19 put SAE for All trainings on the back burner. However, some teacher education programs have incorporated SAE for All into their curriculum and some workshops about SAE

for All have taken place since 2019. But, the intended rollout of SAE for All was more disjointed than planned, which has led to varying levels of knowledge and understanding around the SAE for All framework nationwide. Thus, several methods of implementation exist and philosophies around SAE vary greatly from program to program.

The Career Development Process

If we reflect back to 1908, the reason the project method came to be was to prepare vocational agriculture students to attain the skills needed to work as farmers or to work on others' farms. The purpose of Career and Technical Education today isn't all that different. The goal of agricultural education today is to prepare students for careers in agriculture by developing the technical, academic, and employability skills they need. The good news is that in the past 115 years, we (as a society) have learned a *lot* about how people choose and prepare for a future career. Today, we can use the various theories of career development to justify the activities we implement in our classrooms to help students identify and prepare for their future careers.

There are several career development theories that shape how and why the SAE for All Framework was developed, but in our opinion, the model developed by the National Collaboration on Workforce and Disability (NCWD) most clearly outlines the essential phases of career development for secondary students.

According to NCWD, youth develop the skills for their future careers through three phases. In phase one, students engage in self-exploration. Self-exploration is necessary to discover who they are, what they like, what they value, and beyond. Developing the skills to be self-aware are lifelong skills that will benefit them in their future careers. Self-exploration can be integrated into a school-based agricultural education program by engaging students in career or interest assessments, giving students many opportunities to participate in new experiences, and by utilizing reflection throughout activities. Phase one is most appropriate for 11-14-year-old students and would be the perfect process to engage students in during middle school and early high school.

Phase two involves students in career exploration. Through this phase, students explore careers. They identify possible careers, explore the skills, training, and experiences needed for that career, and analyze whether or not a career is a good fit. Many agricultural education programs involve their students in career projects that require them to research careers in agriculture they may be interested in. Career exploration can be extended to job shadowing, interviewing professionals in the field, or inviting guest lecturers to the classroom. Phase two is most appropriate for 14-16-year-old students who are early in their high school careers. Remember, the goal is to help students develop the *skills* in case they need to continue to explore career options beyond your classroom. It is highly likely you'll encounter seniors or graduates who still need to explore careers from time to time. The goal is they can do that independently instead of under the guidance of a teacher.

The National Collaboration on Workforce and Disability (NCWD) developed a model that outlines the essential phases of career development for secondary students. (NCWD, 2023)

The third and final phase is career planning and management. The goal of this phase is to help students develop the skills needed to plan for their careers, make decisions related to their careers, and develop the employability skills needed for the career of their choice. Successful youth will be confident in their ability to navigate the world of work throughout their lifetimes. Career planning can be directed in an agricultural education classroom by helping students find career mentors, placing students in an internship or apprenticeship, helping students apply to college, or training them to use professional language on the job. Phase three is most appropriate for 17-18-year-old students as they prepare to graduate high school and move on to post-secondary education or training.

Leveraging our current understanding of career development, SAE for All came to be. The goal of SAE for All is to move students through the phases of career development under the guidance of their teacher so they can be as prepared as possible to enter the world of work once they complete their education. Utilizing the framework developed by the renewal committee is intended to help ***ALL*** agricultural education

students and their teachers get the most out of the SAE component of agricultural education.

SAE for All: Yes, We Really Mean All

The Ag Ed Mission states: "Agricultural education prepares students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber, and natural resources systems" (National FFA Organization, 2019). SAE involvement is vital if we intend to accomplish that goal. SAE for All goes beyond hands-on production agriculture skills. It's intended to help students develop *all* of the skills they need to be successful in their future careers *and* in their lives. SAE for All helps teach students skills such as communication, collaboration, leadership, career exploration and planning, employability skills for college and career readiness, problem solving, personal financial management and planning, workplace safety, and agricultural literacy, which are crucial for students' success in the ever-changing workforce. To help accomplish this goal of teaching the skills students desperately need, the National Council for Agricultural Education is proud to be **re-rolling out SAE for All**. Four Train the Trainer events will be held between September 2023 and March 2024 to train a state-designated team of classroom teachers, teacher educators, and state staff members to develop an implementation plan for SAE for All in their states. Those teams will then implement SAE for All trainings in their own states so both teachers and students can benefit from the SAE for All initiative.

If Rufus Stimson could see how agricultural education and his "project method" have evolved, we'd like to think he would be proud. We have a way to go to accomplish the goal of SAE for ALL students enrolled in agricultural education. However, with the revitalization and re-rollout of SAE for All, we believe we are headed in the right direction.

References

American Farm Bureau. (2023). Fast facts about agriculture and food. https://www.fb.org/newsroom/fast-facts

National FFA Organization. (2019, January 14). Agricultural education mission statement. https://www.ffa.org/agricultural-education/#:~:text=The%20Agricultural%20Education%20Mission,fiber%20and%20natural%20resources%20systems.

Moore, G. E. (1988). The forgotten leader in agricultural education: Rufus W. Stimson. Journal of Agricultural Education, 29(3), 50-58. https://doi.org/10.5032/jaatea.1988.03050

National Collaborative on Workforce and Disability [NCWD]. (2023). Career Development. http://www.ncwd-youth.info/issues/career-development/

Stimson, R. (1920). Vocational agricultural education by home projects. The MacMillan Company, New York.

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Debunking Foundational SAE Misconceptions

by Dr. Misty Lambert & Jillian Ford

MacKenna walked into your classroom as a freshman and does not know what she wants to do for a career. **DeShawn** came into agricultural education from a home with a family farming operation, but that enterprise is unrelated to the career he would like to have after high school. **Sofia** has entered your classroom and comes from a family farming operation where she was already working. After a conversation, you realize this family farming operation is directly connected with the career Sofia hopes to have in the future.

Question: Which of these students need a foundational SAE?

Foundational is a great place for MacKenna to start exploring career options. However, since the decisions and information relevant to her as a freshman will change every year she is in high school, she will engage in a foundational SAE every year, not just the first year.

A common misconception of Foundational SAE is that it is only needed for students who do not have an immersion project. Foundational SAE is exactly what DeShawn needs as he explores career options and works to find and understand his place in the agriculture industry and his career after high school. The built-in immersion project he has at home is NOT what he wants to do in the future so the foundational SAE helps him explore and understand his career options and how to prepare for those careers while developing financial literacy skills.

Rather than skipping the foundational SAE because Sofia already has a relevant immersion project, you understand that Sofia has more skills to gain and could develop in her financial literacy, career readiness, and workplace safety skills. While she might take over the family operation and her foundational activities can and should be connected to that enterprise, she will be more prepared if she engages in the foundational activities annually.

The answer is: All of these students need a foundational SAE **every year** they are in agriculture. Don't take our word for it. Page 11 of the SAE for All Teacher Guide tells us "The Foundational SAE is ongoing throughout the student's enrollment in agricultural education and will continue alongside Immersion SAEs implemented by a student."

Let's explore more about SAE using the Myth or Fact approach.

Myth or Fact: SAE hours have to be outside of the school day.

Myth: SAE can happen during the school day and this can be confusing. What determines whether an activity is an experiential learning opportunity or a supervised ag experience? The difference is, for it to be SAE, there is some level of connection to the student career planning and the activity is student rather than teacher managed.

Myth or Fact: There is a mandatory hour requirement for SAE by semester.

Myth: No hour requirement exists. Many teachers use FFA degrees as their guidance trying to have the student Chapter Degree eligible by the end of their second course. We would encourage you to explore whether you are limiting your students' thinking and recordkeeping by putting an hour requirement on their project. If you didn't tell them how "BIG" their SAE needed to be, what would they come up with?

Myth or Fact: Foundational hours count for degrees.

Fact: Foundational hours can absolutely count for greenhand and chapter degrees within your program! The state you teach in impacts what counts for state degrees, so be sure to check your state's specific requirements. Some states accept all foundational hours, some have a limit for the hours allowed, while others do not have any policy in place.

Myth or Fact: Only FFA members are required to have SAEs.

Myth: SAE for All was designed to serve all agricultural education students. While only FFA members can apply for SAE-based awards, like proficiency awards or degrees, every agricultural education can and should have an SAE.

Myth or Fact: SAE does not need to fit a proficiency award category.

Fact: In the current FFA award structure, foundational SAEs aren't addressed in proficiency awards and foundational SAEs may not align with an immersion project that falls within the specified AFNR standards. This does not mean that students aren't still building career and college readiness skills through activities like career exploration, financial planning, and agricultural literacy. The SAE Philosophy and Guiding Principles even states on page 3 "SAE is not defined by FFA award or recognition programs."

Myth or Fact: The only supervisor for a Supervised Ag Experience is the ag teacher.

Myth: Even though we may try, we know that we cannot be in all places at once. It is important to lean on community members to serve as role models and mentors of students in their career area of interest.

Myth or Fact: The teacher is required to provide class time for students to enter SAE records.

Myth: While many teachers do choose to allow students to enter SAE records during class time, this is not a requirement for record keeping. Ultimately, it is up to you as the ag teacher to decide what works best for your program and students to maintain high-quality records.

Implementation Best Practices

The Council has created independent student guides for each of the three levels of foundational SAEs. These guides offer independent, worksheet-style activities that align with the awareness, intermediate, and advanced levels and can serve as great resources to establish foundational SAEs within your program. These guides can be shared with students through paper copies, loaded in a learning management system, or an online learning module available through the SAE for All website.

Due to the highly personalized design of foundational SAEs and the fact that not every student is at the same level, we would recommend creating choice boards where students could choose activities from the various levels of the guides. You can even find additional suggested activities for each category of foundational SAE beginning on page 32 in the appendix of the SAE for All Teacher Guide. Between the independent guides, the suggested activities, and activities you have found or designed you will be able to build a choice board that provides relevant and meaningful activities to reach every student in your classroom.

We would also recommend the choice board be assigned at the beginning of the course with regular check-ins throughout the semester or year. Supporting students as they track their foundational activities could be through activities such as reflections, record books, journals in the AET, or student-teacher conferences. Ideally, this information should be stored somewhere that can be accessible to all agriculture teachers in the program and over multiple classes and years. This can ensure students have access to the foundational experiences they have previously had which will allow them to reflect, set goals, and take the appropriate next steps towards their futures. After all, according to page 2 of the SAE Philosophy and Guiding Principles, "Work done in earlier years is built upon with more complex activities designed to prepare the student for the workplace and or post-secondary education after graduation."

Providing our students with foundational SAEs that are personalized to their individual interests is a key component to help prepare them for their lives outside of school. The Ag Teacher's Creed charges us to **"help make for each of my students a full and happy future."** What better way to meet this challenge than to utilize the nationally recognized and supported foundational SAE component of SAE for All?

References

The National Council for Agricultural Education. (2015, March 31). Philosophy and guiding principles for execution of the supervised agricultural experience component of the total school based agricultural education program. Supervised Agricultural Experience (SAE) Philosophy and Guiding Principles. https://ffa.app.box.com/s/i8ntesw8zsajaxxdnj5cle6zaf0a6za3

The National Council for Agricultural Education. (2018). Teacher edition: SAE for All foundational SAE independent learning guide. https://ffa.app.box.com/s/724w8fh9emxvxq5g4t5ogli89blpw75c

The National Council for Agricultural Education. (2017). SAE for All teacher guide. https://ffa.app.box.com/s/exollg1x7q2lntun3su2mdufw07wiklf

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Are FFA Members College and Career Ready?

by Dr. B. Allen Talbert & Dr. Sarah E. LaRose

The three-component model of school-based agricultural education is uniquely positioned to prepare students for success in careers whether immediately upon high school graduation or with post-secondary education or training. The Agricultural Education for All initiative and restructuring of SAE into SAE for All are designed to assist the agriculture teacher in providing the three-component model to all students enrolled in an agricultural education course. The National FFA Organization's Program Affiliation Membership completes the "for all" philosophy. Schools have been tasked with preparing students who are both college and career ready across the nation. As a career and technical education subject, agricultural education is well-situated to provide opportunities for students to develop those skills.

In 2017, a College and Career Ready person was described as someone who "effectively navigates pathways that connect education and employment to achieve a fulfilling, financially secure, and successful career," (Career Readiness Partner Council, 2017, p. 2). Today's high school graduates are entering a world of work much different from that of graduates from five to seven years ago. Today's graduates are experiencing the workforce disruptions from the global pandemic and the baby boomer generation retiring. Today's worker also must adjust to a workplace where many employees work from home, do gig work, and are challenged by the introduction of AI in the workplace. Additionally, today's worker must be literate in digital agriculture and environmental/land use/animal welfare concerns impacting agriculture. Given all these changes, the question becomes for the 2020s, "what does it mean for an FFA member to be college and career ready"?

> Today's worker also must adjust to a workplace where many employees work from home, do gig work, and are challenged by the introduction of AI in the workplace.

From 2018-2021 Purdue University and National FFA Organization conducted three studies of high school agricultural education students. Each focused on a different aspect of college and career readiness. We were curious to know what FFA members felt about their own levels of preparation for various college and career readiness skills and dispositions.

Employability Skills – Leadership, Communication, and Critical Thinking

Copeland et al. (2020) surveyed 12th grade agricultural education students who were FFA members in fall 2018. They looked at the Employability Skills of leadership, communication, and critical thinking. Responding students perceived themselves to be highly competent in leadership life skills development, moderately competent in communication competence, and within the typical range for critical thinking disposition competence.

This means a high school student who has engaged in two or more years of agricultural education believes they are gaining several of the skills employers expect when they hire someone. Graduates who perceive themselves highly competent in leadership should be able to set and prioritize goals and well as consider the needs and input of others. School-Based Agricultural Education, especially through FFA participation, provides students opportunities to grow in leadership through planning, implementing, and evaluating group activities. Graduates who perceive themselves to be moderately competent in communication skills should be able to communicate well in pairs, groups, meetings, and public speaking. Individuals demonstrating competence in critical thinking engage with problems and solutions, mature thinking, and innovation.

Employability Skills – Openness and Preparedness for New and Emerging Technologies

McBride and Talbert (2022) surveyed 2020-2021 high school seniors enrolled in school-based agricultural education who were FFA members. They looked at the Employability Skills of openness and preparedness for new and emerging agricultural technologies. Respondents reported a high level of openness, but only an average level of preparedness.

Respondents reported self-perceived very strong adaptability.

They found that these students were very open to learning about and using the new and emerging technologies. However, the students did not believe they were as well prepared to use the technologies as they needed to be. Although the respondents were very strong in adaptability, their lowest subscore was curiosity. This means, the teacher may have to introduce students to new and emerging technologies as the students may not seek them out on their own.

Employability Skills - Adaptability

McBride et al. (2023) surveyed 2021-2022 high school seniors enrolled in school-based agricultural education who were FFA members. They looked at the Employability Skills of curiosity toward stretching and embracing and the skill of adaptability. They reported on students from 18 urban programs located in 12 states. Respondents self-reported a moderate level of tendencies to step outside of their comfort zones. They felt that they were very strong in their ability to adapt.

These urban students were willing to stretch and embrace outside their comfort zone and were adaptable. However, they were only lightly involved in FFA activities and opportunities. The school and teacher are critical in guiding students, who are predisposed to explore, to engage with agricultural education through FFA and SAE.

Role of FFA Involvement

All three studies looked at involvement in leadership development through FFA. Each found that FFA members were lightly or moderately involved. This level of involvement included serving as chapter officers and participating in an LDE/CDE below state level. Very few respondents participated in Agriscience Fair, Proficiency Awards, or leadership conferences/camps above the chapter level. In fact, one-fifth of respondents were not involved in any FFA activities. When asked to describe their level of involvement, the largest percentage said, "went, participated, and left," with a smaller percentage involved in working or organizing the event.

As discussed earlier in this article, the aspect of "curiosity" was the lowest self-identified aspect of adaptability. This may mean your students need teacher and peer encouragement to get involved in FFA and SAE.

Postsecondary Plans and Expectations

All three studies asked respondents what they wanted to do after high school graduation. For their post-graduation plans, 94% expected to enter additional training, education, or pursue a 4-year college degree. Two-thirds expected to have a career in an AFNR Career Pathway.

This means your students expect their education and training to continue after high school. You may need to teach them learning skills for the world after high school. Given their expectations to have a career in an AFNR Career Pathway, you as an agriculture teacher are a key provider of future talent for agriculture.

How does this affect your day-to-day teaching?

Agricultural Education for All, SAE for All, and affiliate FFA membership are more than lofty goals. All students enrolled in school-based agricultural education are helped in their career and college readiness through participation in the three-component model. This includes students from low socioeconomic status, racial/ethnic minority status, and those who may not be able to enroll for four years in SBAE because of course scheduling conflicts.

All three of these studies focused on student perceptions of their readiness, not what their actual levels of college and career readiness might be. Sometimes, students might be more or less prepared in actuality compared to what their own perceptions of their preparation might be. The results from these studies can be a useful tool to communicate to administrators, community members, parents, and other stakeholders about the potential impact of your program, but also as a guide for where you might start if you want to make some updates or changes to your programming.

As a teacher of a career and technical education subject, how are you intentionally embedding development of employability skills across all areas of your curriculum? Have you revisited your curriculum materials and learning activities to ensure they align with 21st century agriculture and employment demands? Agriculture teachers are powerfully positioned to impact the lives of their students, but can also enlist the help of others to prepare students for the world beyond high school. Consider how you can leverage the help of SAE employers/mentors, FFA Alumni and Supporters, school counselors, and members of your local program's advisory committee to assist in ensuring your program is best situated to help prepare students for their next best experiences. How will you plan to help your own students experience premier leadership, personal growth, and career success for employment and education in the 21st century?

References

Career Readiness Partner Council. (2017). Building blocks for change: What it means to be career ready. https://cte.careertech.org/sites/default/files/CRPC_4pager.pdf

Copeland, B. A., Talbert, B. A., LaRose, S. E., & Russell, M. (2020). College and career ready? A snapshot of 12th grade national FFA members. Journal of Agricultural Education, 61(4), 90-108. https://doi.org/10.5032/jae.2020.04090

McBride, S. M., & Talbert, B. A. (2022). Openness and Preparedness of Senior FFA Members Toward Technology in Agriculture. Journal of Agricultural Education, 63(1), 98–114. https://doi.org/10.5032/jae.2022.01098

McBride, S., Talbert, A., & Mackey, S. (2023). Involvement of urban agricultural education students in FFA activities and opportunities. Journal of Agricultural Education, 64(2), 145–161. Retrieved from https://jae.sfulib4.publicknowledgeproject.org/index.php/jae/article/view/57

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Work-based Learning: We've Been Doing that for Years, Right?

by Dr. Brooke Thiel & Maggie Wertish

In 2018, the Association of Career and Technical Education released the Quality CTE Framework, as part of the ongoing High-quality CTE Initiative (Imperatore & Hyslop, 2018). One of the 12 key elements of high-quality CTE is the incorporation of work-based learning into CTE programs. Imperatore and Hyslop (2018) define work-based learning as:

> *the delivery of a continuum of work-based learning involving sustained, meaningful interactions with industry or community professionals that foster in-depth, first-hand engagement with the tasks required in a given career field. Experiences may be delivered in workplaces, in the community, at educational institutions, and/or virtually, as appropriate, and includes a range of activities such as workplace tours, job shadowing, school-based enterprises, internships, and apprenticeships (p. 4-5).*

In a recent survey of North Dakota CTE instructors, including school-based agricultural education teachers, we found only 56.9% of respondents reported utilizing work-based learning in their programs. Of the 17 agricultural education teachers who responded, 75% of them reported utilizing work-based learning. Oftentimes, the justification for why agricultural education programs have more participation in work-based learning is attributed to the fact that we've been doing work-based learning since the beginning- in the form of SAE!

When formal agricultural education began in the early 20th century, work-based learning through the project method was ubiquitous. Maintaining an agricultural work project was a requirement of formal agricultural education, thus, nearly 100% of students engaged in direct work experiences in the form of entrepreneurship or placement. But, that was over 100 years ago. Today, SAE has evolved and changed dozens of times, and it continues to change and grow through the SAE for All initiative. Anyone who has taught in an Ag Ed classroom knows there is no *single* clear example of what defines a high-quality SAE. Every teacher and every student approaches SAE in a personalized and unique way.

So, can it be said that Ag Ed has been doing "work-based learning" since the beginning? We would argue that was the case at the beginning. Today, we think we have to ask ourselves if the opportunities we are providing our students are truly work-based learning or if those experiences have evolved into something else entirely. An easy tool to assess whether or not the SAE or work-based learning experiences in which you engage your students align with the definition set forth by ACTE is the Quality CTE Framework Rubric (ACTE, 2018). Per the rubric, quality work-based learning can be assessed by the following standards:

> "...we've been doing work-based learning since the beginning - in the form of SAE!

Effective work-based learning does not have to require employment outside of the school. School-based enterprises can provide students with career exploration and development opportunities on school grounds.

STEM careers in agriculture are some of the fastest growing career pathways in agriculture. It is estimated that 31% of all employment opportunities in agriculture will be related to science and engineering in the next five years (Fernandez et al., 2020).

1. A full continuum of work-based learning experiences, progressing in intensity, is accessible to every student at some point during the program of study.
2. Work-based learning experiences are aligned with relevant national, state, and/or local standards.
3. Work-based learning experiences develop and reinforce relevant technical, academic, and employability knowledge and skills.
4. Work-based learning experiences are intentionally aligned with each student's education and career goals.
5. Work-based learning experiences are provided through delivery methods that maximize meaningful interaction with business professionals.
6. Requirements and procedures for work-based learning experiences that address access, selection, liability, supervision, rights and responsibilities, safety, transportation, learning objectives and evaluations are formalized and shared in advance of work-based learning experiences with employers, students, and parents/guardians (as appropriate).
7. Work-based learning experiences comply with relevant federal, state, and local laws and regulations.
8. Work-based learning experiences are supervised by CTE staff with clearly defined roles.
9. Students engage in reflection and document learning resulting from work-based learning experiences, such as through a portfolio or presentation.

Now, take a moment to assess your SAE program. Does it truly align with the expectations of quality work-based learning? Re-read those statements and substitute SAE for work-based learning. Are we making quality work-based learning experiences available to all of our students through SAE?

If not through SAE, have you ever had your students listen to a guest speaker in class, participate in a job shadow, go on a field trip, or interview a career professional? All of those are examples of work-based learning! Work-based learning doesn't have to be as complicated as finding a student a certified apprenticeship to work at 10 hours a week while going to high school. Actually, work-based learning doesn't require a student to work for anyone! (*disclaimer- it *can* involve working for someone, but it doesn't *have* to involve work outside of the school walls). Work-based learning can be as simple as finding out a student has an interest in precision agriculture and putting them in touch with a professional who can answer some of their questions. It might include a virtual internship where the student works for a precision agriculture company at a distance. It could be a field trip to a local equipment dealership to learn about the new technology being utilized in your region.

Work-based learning is about taking the time to get to know your students and helping them prepare for their future careers as much as possible while they're in high school. It's about directing them to experiences and encouraging them along the path to career success. ***This*** is what SAE for All is trying to accomplish. SAE for All is trying to reorient us to the heart and soul of what SAE is supposed to be about; it's about helping our students find and prepare for their future careers through experiences. It is not feasible for 100% of our students to participate in placement or entrepreneurship SAEs like in the past. However, it is feasible that we could provide career exploration and career development opportunities to 100% of our agricultural education students through SAE for All as part of their agricultural education classes. We challenge you to lean into the new SAE for All framework and see how it might be used to better serve your students, your community, and your agricultural education

program as a whole. Let's get back to our roots where 100% of our students engage in meaningful work-based learning that sets them up for future career success!

References

Fernandez, J. M., Goecker, A. D., Smith, E., Moran, E. R., & Wilson, C. . (2020). Employment opportunities for college graduates in Food, Agriculture, Renewable Natural Resources, and the Environment: United States, 2020-2025. Purdue University. https://www.purdue.edu/usda/employment/

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Supplying the AG-STEM Pipeline: Pause and Think…. Are you preparing your Students to be Ready for College and Careers?

by Catherine A. DiBenedetto & Rosemarie Somers

Let's contemplate that perhaps the most important careers in agriculture are farming and teaching. Similar to the idea of what came first "the chicken or the egg," should we change the order of importance to teaching before farming? Imagine a world without farming. Without farming, we will no longer be able to sustain the future as we now know it…pause and think… According to the United States (US) Department of Agriculture (USDA, 2023), agriculture and its associated industries represent $400 billion in US gross domestic products and export $139.6 billion in commodities, generating over 21 million part-time and full-time jobs. In 2021 the top three household expenditures were housing, transportation, and food (USDA, 2023). Without farmers, how will we nurture and feed the growing population?

> Agriscience courses can provide hands-on, experiential learning opportunities for students to learn and apply the knowledge, skills, and dispositions that are embodied in the curricula and needed for students to be ready for college and careers.

Imagine a world without agriscience teachers…pause and think…The 2021 National Association of Agricultural Educators *Agriculture Teacher Supply and Demand Overview* reported a need to fill 996 agriscience teaching positions nationwide. Without agriscience teachers, who will teach the next generation about agriculture and guarantee we have a pipeline of students ready to enter the Agriculture, Science, Technology, Engineering, and Mathematics (AG-STEM) pipeline needed to support and sustain trade and industry development?

The relationship between increased education and positions in skilled careers is robust. Secondary education is designed to prepare students for advanced learning in post-secondary school or on-the-job/career readiness where additional on-the-job training occurs (Carnevale & Smith, 2013). Do you remember the 'old' term VOCATIONAL Education? The 1990 Perkins Act defined vocational education as "organized educational programs offering a sequence of courses which are directly related to the preparation of individuals in paid or unpaid employment in current or emerging occupations requiring other than a baccalaureate or advanced degree." Now, let's recall the 'new term' and the purpose of Career and Technical Education (CTE). According to the Association for Career and Technical Education, "today's cutting-edge, rigorous and relevant career and technical education (CTE) prepares youth and adults for a wide range of high-wage, high-skill, high-demand careers."

School-based Agricultural Education (SBAE) programs are positioned to foster the knowledge, skills, and dispositions that are required of students to be ready to enter the Agriculture, Science, Technology, Engineering, and Mathematics (AG-STEM) pipeline. College and career readiness skills tend to be categorized collectively. However, are the skills needed for college readiness comparable to the skills needed to be career ready? An even more intriguing question is…pause and think…, can students be ready for college but not career-ready and vice versa? It is important to acknowledge that while some skill sets do overlap, there are fundamental differences between the skills required for career readiness and those for college success. College readiness skills tend to focus on discipline-specific skills, such as reading, writing, note-taking,

proficiency with technology, and critical thinking. Despite the importance of these skills in college-level coursework, students need to develop technical and professional skills as well. Professional skills include problem-solving, communication, teamwork, dressing appropriately, and arriving on time, all of which are essential to success in today's rapidly changing workplace and yet are reported to be lacking in new graduates entering the AG-STEM pipeline.

Many jobs in the United States represent positions that require more education and preparation than a high school diploma but less than a four-year college degree (Wilson & Mehta, 2017). Many jobs require specialized technical skills or certifications that can be obtained through two-year community college programs. Community colleges and two-year technical schools offer targeted courses, hands-on experience, opportunities for networking, and professional development geared toward the needs of the agriculture industry. Considering about 40% of students begin their post-secondary studies at two-year institutions, a community college degree program is valuable in that it provides students with technical knowledge and skills that align with many "mid-level" careers that currently have a high demand for qualified graduates. Employers throughout the United States have reported a limited supply of applicants and many people who do apply lack essential skills and relevant work experience (Wilson & Mehta, 2017).

What skills are you teaching in your agriscience courses to prepare your students to be ready for college and careers? Let's take group work/teamwork as an example. Pause and think... Have you considered when you ask your students to "get into a group" or "pair up" they may not know what you expect? How do you define group work/teamwork? Many heads are better than one. Work smarter, not harder? Collaboration? Cooperative learning? Does the assignment or task you have planned require multiple people to accomplish the task? Do you teach teamwork skills?

An essential skill in the AG-STEM workforce is the ability to work in a team. The agriculture profession often involves large-scale operations that require

21st-century career readiness skills include a variety of related knowledge, skills, and dispositions (DiBenedetto & Myers, 2016).

21st-Century Career Readiness Skills	
Knowledge, Skills, and Dispositions	*Related Skills*
Career Skills	Career decision-making, Job search skills, Productivity, Responsibility, Work habits/ethics
Dispositions	Creativity/creative thinking, Engagement in life-long learning, Flexibility, Innovation, Motivation, Perseverance/grit, Personal productivity, Responsibility, Self-direction/self-discipline, Self-esteem
Experiences	Career-related work experience/internship, Community engagement, Cross-disciplinary connections, International engagement, Leadership, Project management, Teamwork
Incidental Learning Skills	Adaptability, Confidence, Decision making, Flexibility, Leadership, People skills, Productivity, Proficiency, Initiative/self-direction, Teamwork
Interdisciplinary Topics	Agriculture, Civics, Communications, Economics, Environment, Global awareness, Health, Technology
Knowledge Competencies	Decision making, Innovation. Proficiency, Personal productivity, Teamwork
Learning Skills	Contextual learning, Critical thinking, Initiative, Perseverance/Grit, Problem-Solving, Reasoning, Self-direction
Life Skills	Accountability, Goal management, Organizational skills, Problem-solving, Social/cross-cultural skills, Time management
Social Skills	Understanding diversity, Ethical responsibility, Honesty, Integrity, Social responsibility

Dr. Phil Fravel, Professor in the Agricultural Education program at Clemson University teaches an electricity unit to help "turn the light bulb on" for career readiness when teaching preservice teachers. S. Matthew DuBose is now an Agricultural Education Teacher at Anderson Institute of Technology in South Carolina.

coordination and cooperation between a number of individuals. Collaboration allows for the sharing of knowledge, skills, and resources, which has the potential to lead to greater efficiency, productivity, and overall success. A table of 21st-century career readiness skills that include a variety of related knowledge, skills, and dispositions (DiBenedetto & Myers, 2016) is outlined to help show the areas you may be able to focus on in your daily teaching and advising of the students in your SBAE program.

The content outlined throughout the curricula in agriscience courses should be taught in a way that enables students to transfer their knowledge and technical skills to be applied when directly entering a career or advancing to a post-secondary degree program. The three-component model of an SBAE program is logically designed to prepare students for both college and careers. For instance, let's pause and think about the purpose of Career Development Events (CDE) and Supervised Agricultural Experience (SAE) programs. Are you intentional about making connections to college and careers when your students participate in CDEs? CDEs and SAEs are intracurricular activities that provide students with the opportunity to demonstrate their knowledge, skills, and dispositions. Students gain valuable feedback from industry professionals and develop a deeper understanding of the diverse career paths available to them in agriculture.

Career-connected learning experiences provide students with real-world and hands-on opportunities to help students bridge the gap between classroom learning and career pathways. Career-connected learning prepares students with valuable skills to connect with industry professionals and learn more about the professional and technical skills expected of them in the job market before making the transition into their careers.

Participation in applied learning and/or project-based learning experiences are beneficial to prepare students for careers. Employers prefer to hire candidates who have project-based learning experiences (Hart, 2015). Agriscience courses can provide hands-on, experiential learning opportunities for students to learn and apply the knowledge, skills, and dispositions that are embodied in the curricula and needed for students to be ready for college and careers. Emphasizing how the content and the skills in the agriscience curricula are connected to AG-STEM careers is important and can be emphasized in all three components of an SBAE program. We challenge you to pause and think about how you are preparing your students to be ready for college and careers. Are you intentional about calling attention to the knowledge, skills, and dispositions that will help your students be successful? Pause and think...

References

Carnevale, A. P., & Smith, N. (2013). Workplace basics: The skills employees need and employers want. Human Resource Development International, 16(5), 491-501. Doi : 10.1080/13678868.2013.821267

DiBenedetto, C. A., & Myers, B. E. (2016). A Conceptual Model for the Study of Student Readiness in the 21st Century. NACTA Journal, 60.

Hart. (2015). Falling short? College learning and career success. A survey of employers and college students conducted on behalf of: The Association of American Colleges and Universities. Washington, DC: Hart Research Associates, Inc.

United States Department of Agriculture (USDA). (2023). Ag and food statistics charting the essentials. https://ageconsearch.umn.edu/nanna/record/333548/files/ap-111.pdf?withWatermark=1&withMetadata=0&version=1&registerDownload=1

Wilson, B., & Mehta, S. (2017). Work-Based learning Policy: 50-states scan. National Skills Coalition. April. https://www.voced.edu.au/content/ngv%3A76884

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Putting Rural Education on The Map Through Innovative Partnerships Between Businesses, Institutions of Higher Education, and Educational Non-Profits

by Dr. Emily Perdue, Dr. Kim Alexander, Dr. Gary Briers, Dr. Glen Shinn, Jaclyn Vance & Tony Miller

Welcome to Rural--It's a ***big*** country that covers 97% of the US, but it's a *small* population that accounts for 19% of the 336 million Americans--still 64 million people. Our rural schools and communities are under siege by poverty, educational deserts, terminal diplomas, and out-migration —not to mention enduring a pandemic without access to broadband or health systems. "In 2016, 13.4 million children under the age of 18 lived in the rural areas of the nation" (U.S. Census, 2016). White et al. (2017) described how factors favor urban growth over rural growth. Migration is transforming the largest metropolitan areas into urban growth hubs while many rural areas are experiencing flat or negative population growth.

Rural students come to school with high aspirations. They aspire to become doctors, lawyers, and astronauts! However, they often face expectations from adults that are deflating and demoralizing. Dalton and Tejeda (2021) found that "despite the correlation between education and jobs, rural America remains distrustful of postsecondary education. Rural residents see college costs unchecked and college degrees pushing young people out of their hometowns. This situation has conspired to make rural residents wary of higher education, which helps explain why only 33% of rural dwellers believe that a four-year degree is worthwhile," (p. 3).

Where? Challenges (needs) become solutions-- Rural communities often face a significant gap in educational opportunities compared to their urban counterparts. Rural students are more likely to graduate from high school than their urban peers, but much less likely to pursue postsecondary education. To address this gap, higher education institutions and other educational partners must work together to develop successful regional innovations. A 2020 report by the National Institute of Food and Agriculture and Purdue University expects an estimated 59,000 jobs related to agriculture to be available annually between the 2020 and 2025 (Fernandez, Goecker, Smith, Moran, & Wilson, 2020). Employer demand will exceed the supply of new college graduates in agricultural management, food and biomaterials production, and science and engineering. Innovative partnerships between schools, communities, institutions of higher education, and educational non-profits can lead to new ideas and approaches to improving rural education and communities.

How? Supervised Agricultural Experiences (SAEs) include Col-

(RIGHT) Students at Van Jr. Sr. High School presented their Collaborative Object of Agricultural Learning at the annual West Virginia P-20 Research symposium in 2021. (OPPOSITE LEFT) Students at Van Jr. Sr. High School presented their Collaborative Object of Agricultural Learning at the annual West Virginia P-20 Research symposium on the campus of West Virginia University in 2022. (OPPOSITE RIGHT) Students from Roscoe Collegiate Independent School District receiving the First Place award in the animal systems agriscience fair at Texas FFA State Convention in 2022.

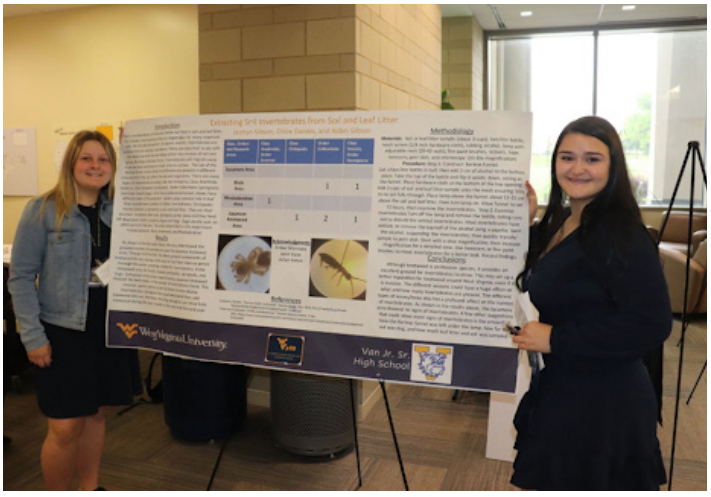
laborative Objects of Agricultural Learning (COALs). COALs are natural extensions of SAEs that encourage critical thinking, problem-solving, and independent learning skills, provide practical experience, and prepare students for postsecondary education, apprenticeships, and certifications (Daugherty, et. al., 2020). *For example, "Catherine"* was interested in animals and their health early. Using a series of COALs, *Catherine* is now in her second year of veterinary school.

How? Early college programs increase access to postsecondary education in rural areas. Utilizing a P-20 model that starts with students in pre-kindergarten and supports them through primary, middle, secondary, and post-secondary education can increase access to postsecondary education. The model moves students through a curriculum framework highlighting rigorous academic training (i.e., early college high school), career training, and research-based STEM integration, beginning in elementary school with project-based learning and culminating with a capstone project in eleventh through twelfth grades. The expected outcomes for students at high school graduation are threefold: 1) **associate** degrees indicative of college readiness, 2) **industry-based** certifications indicative of career readiness, and 3) a capstone **research project** indicative of lifelong learning. As the cost of higher education increases, many high school students have begun taking dual-credit/early-enrollment courses toward an associate degree. Dual enrollment has nearly doubled between the years 2011 and 2021 (Quilantan, 2023). ***Micro-credentials*** provide short, competency-based recognition that enables the participant to demonstrate mastery in a particular area. In higher education, a micro-credential is a qualification focused upon a specified professional or career discipline. It typically comprises one or more sources of accelerated educational experiences.

Where? The goal is to provide rural youth the opportunities to prepare for and guide them toward various career choices in agriculture and natural resources. In addition, the established P-20 school districts have partnered with a national educational non-profit to end generational poverty in rural America. This growing program has been implemented in twelve Texas districts and one West Virginia county school system and is poised to go national. Through this program, students can participate in career and technical development programs, internships, apprenticeships, and graduate high school with an associate degree.

What is CEN? Collegiate Edu-Nation (CEN) is a growing not-for-profit network of high-performing rural school districts using their defining strengths to tackle their biggest challenges. CEN is a partnership empowering young people to build a future with more opportunity, prosperity, and impact. CEN is acutely aware that in rural settings, as the school goes, so goes the community. CEN was formed to provide local school districts in Texas with capacity building, enhanced service support, statewide networking, professional development, and continuous improvement systems. The CEN transformation entails deploying the P-20 model to produce 100% high school completion, with 90% of the high school graduates earning associate degrees and industry-recognized certifications.

CEN partnered with West Texas A&M University and Texas A&M University to develop a model to produce successful efforts to equip individuals living in rural communities with the credentials necessary to operate a P-TECH program. This program supports teachers and community leaders to earn the credentials necessary to teach college-level courses. In addition, P-TECH allows high school students to continue their studies after graduation at technical centers to complete a four-year degree. CEN then partnered with West Virginia University to expand the P-20 model. The collaboration between CEN,



West Texas A&M University, Texas A&M University, and West Virginia University is a unique cooperation model that brings together school-age students and faculty researchers. The P-20 program prepares students by providing a meaningful connection between hands-on experiential learning with career development opportunities. A vital component of the model is its collaboration with higher education institutions that allow all students to complete an associate degree while still in high school.

Why partner with Institutions of Higher Education? Strong partnerships share access to micro-credentials, resources, and professional development opportunities. Active SAE/COALs open opportunities for collaborative research. The active collaboration exposes students to college life and encourages them to pursue high-demand careers. Partnerships between rural schools and businesses/industries can benefit both parties by helping to develop a skilled workforce, providing experiential learning opportunities, strengthening community relationships, and supporting academic success.

Why should rural schools partner with business and industry? Workforce development and career exploration: Partnering with businesses and industries can provide students with opportunities for experiential learning, such as internships, job shadowing, and apprenticeships.

What are the results? CEN network is a growing network of 17 high-performing rural school districts, with a student enrollment of 7,534, using our defining strengths to tackle our biggest challenges. These high schools have produced 100% completion of high school diplomas, approaching 90% of graduates earning associate degrees and industry-recognized certifications. Further, the expectation is that 80% of those graduates earn bachelor's degrees and certificates within three years, and 70% earn postgraduate degrees and advanced certifications with little or no debt (CEN, 2020). Texas AgriLife Extension, Texas A&M University, and West Virginia University collaborate with the established P-20 schools. Extension specialists and faculty at both universities work within schools from 3rd to 12th grade to help identify and advise STEM learning experiences for youth.

Involving students' research abilities related to "real-world" STEM and interacting with subject-matter specialists can enhance students' competencies in STEM-related courses and knowledge of the scientific method. Students in the 10th-grade and below conduct group research projects. The 11th and 12th graders' research projects are capstone projects conducted individually. Student research projects have been recognized locally, regionally, statewide, and nationally.

The mission of this non-profit is to empower rural school districts to support and educate students/youth, beginning at home, continuing from the first day of Pre-K through postsecondary, leading to meaningful careers for lifetime success. In an evolving social culture, CEN leads toward the future by focusing on the "new" college and career vision, achieving affordable access and educational attainment, integrating transformative educator development, and providing exemplary local technical support. The tripod

> "...higher education institutions and other educational partners must work together to develop successful regional innovations."

approach—college degrees, industry certifications, and youth participatory action research can stabilize rural students. The collaboration between institutions of higher education, the cooperative extension service and CEN is a unique model of cooperation that brings school-age students and faculty researchers together to provide meaningful connections between hands-on experiential learning with career opportunities in and outside the classroom. Boudreau (2021) reported that "when educators collaborate in the research process with young people, their research has increased relevance and validity, making their findings more powerful" (p. 2).

What are the plans? The CEN non-profit strategic plan focuses on five efforts:

1. Transform rural school districts.
2. Enhance education partnerships.
3. Expand CEN P-20 regionally and nationally.
4. Strengthen rural schools' financial position.
5. Build, support, and retain a world-class team.

Putting rural education on the map through innovative partnerships between businesses and industries, institutions of higher education, and educational non-profits is essential to addressing the educational and economic challenges facing rural communities. These organizations can help create more equitable and sustainable educational opportunities for students, businesses, and rural communities by working together.

So "come now and let us reason together" and plan the future with shared imagination and wisdom.

References

Boudreau, E. (2021, October 28). How to work with young people who want to make change. Harvard Graduate School of Education. https://www.gse.harvard.edu/news/uk/21/10/how-work-young-people-who-want-make-change

Collegiate Edu-Nation (CEN). (2020). We're putting rural education on the map. Matriculation Guide. https://[non-profit.org/wp-content/uploads/2020/11/non-profit-Playbook_Oct2020-1.pdf

Dalton, R., & Tejeda, M. (2021, Nov 22). Want to help rural kids become college and career ready? Harvard Graduate School of Education. https://www.gse.harvard.edu/news/uk/21/11/want-help-rural-kids-become-college-and-career-ready

Daugherty, K., Perdue, E.R., McKibben, J.D., (2020). The West Virginia P-20 program. Poster presented at the National Association of Extension 4-H Youth Development Professionals Annual Conference.

Fernandez, J., Goecker, A. D., Smith, E., Moran, E., & Wilson, C. A. (2020). Employment opportunities for college graduates. United States Department of Agriculture and Purdue University.https://www.purdue.edu/usda/employment/

Quilantan, B., (2023, March 11). Biden's Free College proposal is dead. high schoolers are tapping a solution. POLITICO. Retrieved March 28, 2023, from https://www.politico.com/news/2023/03/10/dual-enrollment-community-college-biden-00086625

Swigert, J. (April 13, 1970) "Okay, Houston...we've had a problem here" NASA, Apollo 13.

Texas Agrilife Extension Service. (2021). Program helping rural students with higher education. https://stateextensionservice.edu/2021/11/04/program-helping-rural-students-with-higher-education/

White, S., Potter, L.B., You, H., Valencia, L., Jordan, J. A., Pecotte, B., & Robinson, S. (2017). Components of population change in urban Texas. Texas Demographic Center.

(OPPOSITE LEFT) P-20 students visiting WVU to present their research projects.
(OPPOSITE RIGHT) Students visit the WVU Equestrian Center during the Research Symposium
(LEFT) Amanda Sanchez, Roscoe ISD graduate, celebrates her graduation from West Texas A&M University alongside CEN members. Shown are (l to r): Marsha Alexander, Kim Alexander, Morgan Martin, Amanda Sanchez, Walter Wendler, Trish McCormick and Andy Wilson.

United States Census Bureau. (2016). New census data show differences between urban and rural populations. https://www.census.gov/newsroom/press-releases/2016/cb16-210.html

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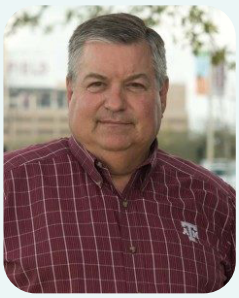

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Glen Shinn, a graduate of Oklahoma State, began as a vocational agriculture instructor in Missouri. Glen has been a faculty member in five universities and works internationally in post-conflict agricultural development and higher agricultural education. He is a professor emeritus at Texas A&M University.
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Dr. Kim Alexander grew up on a farm near Roscoe, Texas, and became the superintendent for Roscoe Collegiate Independent School District from 2003 to 2019. He has been serving as the CEO of Collegiate Edu-Nation since 2019.

Jaclyn Vance (left), Science Teacher and Tony Miller (right), Agricultural Science Teacher, Van Jr. Sr. High School, Van, West Virginia. Ms. Vance and Mr. Miller are both teachers at the P-20 school in West Virginia that participates in the WV P-20 program. They lead the student-led research projects (COALs).

Taking Learning to "Infinity and Beyond"

by Breanna Pastir

Readers and fellow agriculture educators, it is launch operator, Breanna Pastir. The mission of this article is to inform you of the "out of this world" career opportunities you can prepare students for right now. Mission objectives include identifying what space farming is, learning about the program your students can be involved in, and learning about how space farming is being done right now… closer than you may think. Are you ready to take off with engagement in your classroom?

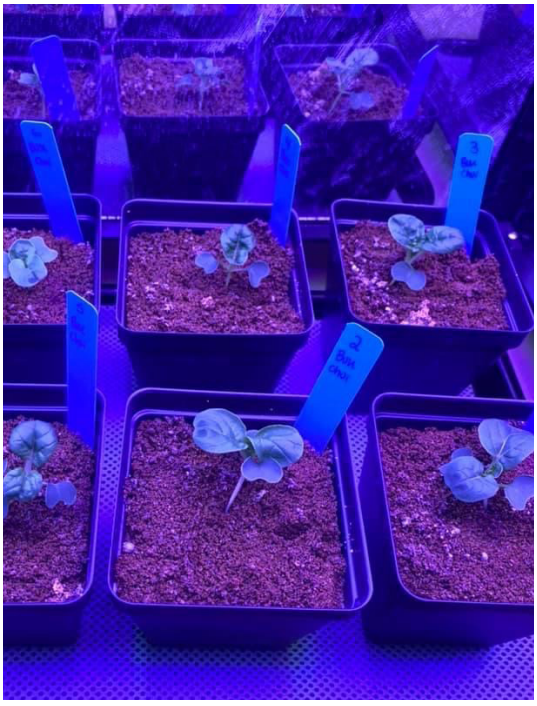
Engaging students in new, innovative technologies should be the goal of every agriculture teacher. When tasked with introducing my students to activities that would pique their interest as well as prepare them for future careers, I stumbled upon space farming in the classroom through Mars Farm and the Growing Beyond Earth program.

Space farming could be the farming of the future. This unique method of farming will be able to help us in many ways from saving money and getting food to the space station; to one day being able to have full-scale farms on Mars and increasing the overall physical and mental well-being of space crews.

Currently, on the international space station, astronauts receive regular shipments of a wide variety of freeze-dried and prepackaged meals to cover their dietary needs. When crews venture further into space, traveling for months or years without resupply shipments, the prepackaged vitamins break down over time, which presents a problem for astronaut health and wellbeing. NASA is looking for ways to provide astronauts with the nutrients they need using freshly grown fruits and vegetables. The challenge is how to do that in a closed environment without sunlight or Earth's gravity.

Currently NASA is using *The Vegetable Production System*, also known as Veggie. It is a space garden residing on the space station. Veggie's purpose is to help NASA study plant growth in microgravity, while adding fresh food to the astronauts' diets and enhancing well-being and happiness on the space station. Veggie is small, holding only six plants at a time. Each plant grows in a clay-based growth media and fertilizer called a "Pillow." The pillows are important to help distribute water, nutrients, and air in a healthy balance around the roots. Otherwise, the roots would either drown in water or be engulfed by air because of the way fluids in space tend to form bubbles from the lack of gravity (NASA, 2021).

To date, Veggie has successfully grown many different plants including three types of lettuce, mizuna mustard, Chinese cabbage, Red Russian kale, and zinnia flowers (NASA, 2021). Some other plants the program hopes to grow in the future are different kinds of produce such as tomatoes and peppers, as well as antioxidant-rich foods like berries and certain beans. Plant size is a vital calculation in determining what to



The plants were checked every seven days for data collection. The students were surprised at how fast the growth cycle was. Shown here is misome (left) and Bok Choy (right).

(LEFT) Every seven days the plants are taken out of the growth chamber and data is collected and recorded. The data that is collected is plant height, plant width, health of the plant, mass of the plant, temperature of the growth chamber and room, humidity of the growth chamber, and how much water is given over the week. (RIGHT) In the growth chambers, plants sit on a moisture-wicking material which makes watering easy and consistent. The sides of the chambers can be raised to check plant growth and to water the plants.

> As agriculture teachers, we get the unique opportunity to teach students the skills they need to succeed in an ever-changing workforce, often for careers that do not even exist yet.

grow on the space station, where every square foot is carefully allotted. Harvest time is also of extreme importance. The average crew stays on the International Space Station for six months, which limits the number and variety of plants that can be grown during that amount of time.

Having a garden on the International Space Station can even help the astronauts' mental well-being. Having the everyday task of taking care of a plant can help the astronauts feel like they still have a tie to life back on Earth. Taking care of a plant can reduce stress, improve the mood of astronauts, decrease chances of depression, increase the social growth between astronauts, and affect general overall wellness.

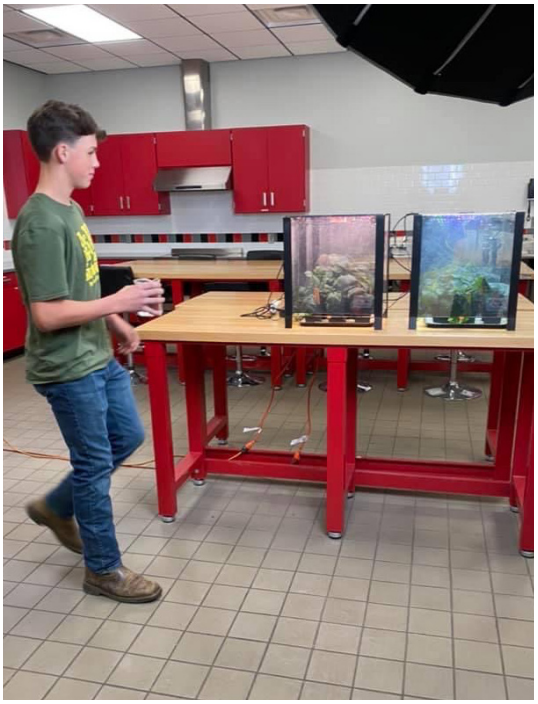
Space farming will be important to achieve at a larger scale. As an example, it costs an average of $10,000 per pound of food when sending it to the International Space Station (Hirsch, 2018) and will cost even more to send it on space missions to other places such as the moon or Mars. Technically, NASA's shelf-stable food is safe to eat for five years, but after two years, most of the food's nutritional content is significantly depleted. If we were able to have a small space farm on space missions, we would be able to drastically cut down on the cost of the mission and ensure the astronauts would have nutritious food to eat.

Space farming may be closer than we think. The Wahpeton Agriculture Department, where I previously taught , has been part of a program called Growing Beyond Earth since 2020. This project, a partnership with Fairchild Botanic Gardens and NASA, allows students to see firsthand how vegetables are grown in space. Growing Beyond Earth involves a series of plant experiments conducted by students in middle and high school classrooms. These experiments are conducted in Mars Farms, a plant growth chamber like the Veggie Production System on the International Space Station.

Currently, there are experiments in progress with the Growing Beyond Earth program in more than 250 middle and high schools across the country. In our Mars Farm units, we have grown red lettuce, radishes, misome, and bok choy. Our experiments allowed us to test how different light spectrums affected plant growth over time, the effects of varying amounts of slow-release fertilizer on the plants, and how 12- and 24-hour photoperiods affected plant growth.

Through the Growing Beyond Earth program, students can conduct citizen science projects in their own classrooms. This project promotes inquiry-based learning

(LEFT) On the final day of the experiment, we harvested the plants. Some activities students performed during harvest were final watering, data collection, and sampling the vegetables that were grown.
(RIGHT) On the final day of the experiment, we collected final data prior to harvesting. This data includes: final mass, edible mass, non-edible mass, width of plant, and height of the plant.



as students are guided through their real-world, scientific research, which has been tied to the development of career readiness skills. Throughout the project, students collect and record data in a detailed observation report that is shared directly with NASA scientists. Data collected through the project includes the health of the plants, room temperature and humidity, chamber temperature and humidity, number of leaves, plant height, and plant width. The data that is collected from the Mars Farms provides valuable insight to NASA scientists. "GBE is providing a steady stream of valuable data to NASA scientists who are developing technologies for growing food crops for long-duration missions into deep space," (Fairchild Gardens, n.d.). This project has engaged over 12,000 students and teachers across the country and will continue to do so for years to come.

Why is this important?

As agriculture teachers, we get the unique opportunity to teach students the skills they need to succeed in an ever-changing workforce, often for careers that do not even exist yet. Helping our students attain 21st century skills is another challenge for agriculture teachers. Space agriculture, specifically in the Growing Beyond Earth program, allows students to gain skills such as critical thinking, collaboration, problem solving, innovative thinking, and global awareness. Space agriculture also allows students to see into the future and learn how to prepare for it right now.

Where does space farming go from here? I'm confident that farming in space will continue to grow and improve with projects like Veggie and Growing Beyond Earth. To continue to grow the future of agriculture, we must look beyond earth to the limitless options that space farming provides. Space Farming: one small step for man, one giant leap for mankind.

Want to be involved in the Growing Beyond Earth Project? Check out the QR code for for more information:

Breanna Pastir is a former North Dakota agricultural educator and FFA advisor and currently serves as the SAE for All Specialist and Senior Educational Consultant for National FFA.

The Value of an Ally

by Shelby Davis

If you surprised me with a day off school, told me to pack my bag, and asked me to pick our activity for the day, I would take you to the Shedd Aquarium in Chicago, Illinois. After getting through the downtown traffic, parking, and the price of the snacks, there are countless ways to enjoy this beautiful, expansive aquarium. I think I could spend the entire day staring at the same tank of fish, swimming harmoniously, coexisting with each other and their environment. Every new view of the tank shows more diversity in that population. Red, blue, spotted or striped, they coexist happily without a worry. With that being said, I wouldn't be able to help but think about my students. In every fish I would see colors, patterns, features, or behaviors that would remind me of one of my high schoolers, and I would hope they felt safe, welcome, and happy in my classroom. I would wish I could keep them safe in a giant glass tank filled with water and watch as they merrily swam around for the day. I would hope for their success no matter where life takes them, and feel thankful for their interest in agriculture, because it brought our stories together.

Everyone knows a high school student. Perhaps you know someone who is in their mid-late teens, who sleeps too late and forgets their lunch at home, or who drives too fast. A teenager who is emotional, sensitive, and focused more on finding out who they are than who invented the Pythagorean Theorem. Maybe the teenager you know feels like an outsider because of how they identify themselves through gender or sexual orientation. During these formative years of development, it's more important than ever that we support these students through figuring out their identity, relationships, careers, and so much more. Even if young people do not personally identify as part of the LGBTQ+ community, they may know someone who does. According to University of Minnesota Extension, inclusion of these individuals is essential for positive youth development programs (Rand, 2023).

Our high schoolers rely on youth development programs to learn lessons about leadership, community engagement, and success. These programs promote the growth and connections our students make that can last a lifetime, and they can impact everything from their peer relationships to their future career path. In their peers, these students look for affirmation, and there is significant power in finding validation from people around them (Mohammed et al., 2017). This is why it is so important to ensure that every student has a community to be a part of and an adult to support them, so they can positively develop into who they are meant to become. Just like our students who are exceptionally talented, racially diverse, or interested in robotics, agriculture, or art, our LGBTQ+ students deserve this same community, to be accepted for who they are, and to be given the same opportunities in youth development programs. Our LBGTQ+ students deserve an ally.

The St. Louis Aquarium in Union Station is another fantastic aquarium to visit and watch the diverse marine life.

What is an ally? Allies are those who stand in our corner, take action to defend those on the outside, and support marginalized groups in times of need. Allies take the time to educate themselves on current issues affecting their communities so they can better understand the perspective of marginalized groups of people, and allies can create a more welcoming and inclusive environment for these individuals (Lamont, 2021). The value of an ally cannot be overestimated, as they can play a crucial role in creating more accepting, equitable, and inclusive societies. Allies can serve as role models as well, promoting positive interactions, creating a culture of allyship, and inspiring others to be allies themselves. Historically, allies have supported various groups through suffrage, the Civil Rights Movement, and religious intolerance. When it comes to LGBTQ+ communities, allies are typically heterosexual people who are willing to learn about, support, and rally around those who do not identify as heterosexual. Without allies, we may never be able to reap the benefits of diverse communities and rich perspectives.

While research on LGBTQ+ youth participation in youth development programming is still developing, we know that youth who identify as LGBTQ+ are commonly victimized and at risk of experiencing stigma that is associated with this identifier. This can result in missing school, anxiety, depression, lower GPA, lower levels of self-esteem, and more negative effects (Rand, 2023). According to Movement Advancement Project data, between 10-15% of LGBTQ+ population live in rural areas (Movement Advancement Project, 2019). Agriculture youth development programs have a unique opportunity to impact youth living in rural areas and beyond, support them through various development programs, and promote community engagement as they move into adulthood.

As agricultural educators, our local FFA chapters operate as youth development programs to support, engage, and grow young people. Youth.gov defines positive youth development as an intentional approach that engages youth in their schools, peer groups, and families that is productive and constructive (youth.gov, 2023). Positive youth development provides opportunities for fostering positive relationships and leadership strengths as well. Ideally, every student has the opportunity to engage in a youth development program, whether that is FFA, a sports team, or a community group. As agricultural educators, we are committed to embracing the ideas of positive youth development in our chapters to prepare and promote the next generation of leaders, regardless of their sexual orientation.

> The value of an ally cannot be overestimated, as they can play a crucial role in creating more accepting, equitable, and inclusive societies.

Youth development programs like local FFA chapters can bring positive youth development concepts to hundreds of thousands of students nationwide. Programs like FFA and 4-H provide structure, belonging, and opportunities for success, along with competitive opportunities to find confidence and develop career skills and competencies (Taylor, 2021). Students who participate in local 4-H programs are four times more likely to give back to their communities (University of Florida Extension, n.d.). When we see the tangible benefits of youth development programs, including FFA and 4-H, it's clear that it would be a disservice to those students and our communities to exclude any member of our schools who would be powerful contributors to the diversity and success of our programs. We should consider the mutual benefits to welcoming and being an ally to LGBTQ+ students as they further their education.

We have all been in a room where we stand out for being different. Conference rooms, school board meetings, work events, or recreational activities all provide opportunities for our differences to make themselves known. In agricultural education, differences are made known everywhere from the classroom to the convention hall. As we continue to welcome more people into our organization, we should remember that being represented makes an enormous difference in a student's decision to be a part of an organization. As reported by the National FFA Organization, over 22% of the organization's 850,000 national members identify as non-white (National FFA Organization, 2023). Additionally, research in agricultural education shows the attitudes of teachers play an important role in the success of a diversity inclusive program (Roberts et al., 2009).

Like many industries, agriculture has had many stages of growth in diversity. For decades, agriculture stayed the same. We made slow progress advancing in crop production and animal husbandry. It was only when Extension agents made an appearance and encouraged farmers from all over the country to share their

findings, did we begin to make a bigger difference in agricultural production. What was once an industry of rural, middle class men has grown over time to include more diverse groups of individuals. Over time, people of different genders, backgrounds, races, economic status, and geographical location have entered the agriculture industry. Through different perspectives, these groups of people have only helped the industry grow and change in positive ways. The agricultural industry has become more diverse in thought, science, sustainability, economics, and welfare. As we recognize the positive difference this inclusion has made in our industry, how can we argue that excluding a group of people based on their sexual orientation is beneficial for agriculture?

Agricultural education helps students find out who they are, it helps them connect to kids at other schools and as a result, students are able to find people like them. Students find community, and that community breeds new, inventive ideas. It's with these ideas that we will solve pressing issues in agriculture like diversity, sustainability, and adaptability. Positive youth development focuses on reinforcing a student's strengths. If we are able to see everyone's differences as strengths rather than weaknesses, we invite new perspectives and rich knowledge to this growing, ever-important industry.

As an agricultural educator, becoming an ally can be as simple as keeping your classroom door and mind open to new students, or as important as supporting marginalized students at a school board meeting or state FFA event. As we move forward as educators, we have to be mindful of the purpose of youth development programs and use it as an anchor for all of our programming.

By adopting a lens of allyship we can practice what it means to be truly inclusive, from teaching diverse cultural perspectives in agriculture to welcoming all types of students into leadership roles in your chapter. Agricultural education is not for one type of student. It is for all students.

In our schools and communities, we're all little fish in a big aquarium. Whether we swim at the surface or deep below the skies, we make waves with every move, and we rely on each other for protection, support, community, and structure. We are connected, our stories are interwoven, and we exist as an ecosystem. We are allies for each other, and we need diversity in our communities to become better as a whole. Our communities need diversity to be welcomed, and their futures rely on embracing new people, new ideas, and change. Just as our aquarium has thousands of colors, shapes, sizes, and families, the agricultural industry has grown to become more diverse. The value of an ally is immeasurable, and we owe it to our students and their future to use the lens of allyship in all areas of agricultural education.

References

Lamont, A. (2021). The guide to allyship. https://guidetoallyship.com/

Mohamed, N. H., Hamzah, S. R. A., & Samah, I. A. I. B. A. (2017). Parental and peer attachment and its relationship with positive youth development. International Journal of Academic Research in Business and Social Sciences, 7(9), 352-362.

Movement Advancement Project. (2019). Where we call home: LGBT people in rural America. www.lgbtmap.org/rural-lgbt

National FFA Organization (2023). FFA membership reaches all-time high. https://www.ffa.org/press-releases/ffa-membership-reaches-all-time-high/

Rand, A. J. (2023). Inclusive youth development programs for LGBTQ+ people. UMN Extension. https://extension.umn.edu/equity-culture-and-identity/inclusive-youth-development-programs-lgbtq-people

Roberts, T. G., Hall, J. H., Briers, G. E., Gill, E., Shinn, G. C., Larke, Jr., A & Jaure, P. (2009). Engaging Hispanic students in agricultural education and the FFA: A three–year case study. Journal of Agricultural Education, 50(3), 69-80. doi: 10.5032/jae.2009.03069

Taylor, B. (2021). How 4-H and FFA provide exceptional youth development. AGDAILY. https://www.agdaily.com/ffa/4-h-ffa-provide-exceptional-youth-development/

University of Florida Extension (n.d.) How Will You Inspire the Next Generation? Northwest District 4-H. https://nwdistrict.ifas.ufl.edu/district-4h/how-will-you-inspire-the-next-generation/

youth.gov (2023). Positive Youth Development. https://youth.gov/youth-topics/positive-youth-development

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Gothic Arch Is Your Source for Institutional & School Greenhouses

Backyard growers and commercial operations aren't the only ones who need high-quality greenhouses for less. At Gothic Arch Greenhouses, we also cater specifically to institutional customers who require greenhouse kits and custom designs to teach, provide food for a burgeoning population and much more. No matter the size or style of greenhouse required or the intended application, we're here to assist.

Gothic Arch Greenhouses is an Alabama-based business that's been around since 1946. Since our inception, we have worked hard to become the most trusted name in the greenhouse industry. As a family owned company, we take customer satisfaction very seriously. To ensure our company is the go-to source for greenhouse supplies, we offer only the very best in greenhouse kits and custom designs at prices our customers love. From backyard designs to large-scale commercial and institutional creations, we put quality into everything we do.

800-531-GROW-4769
https://www.gothicarchgreenhouses.com/

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