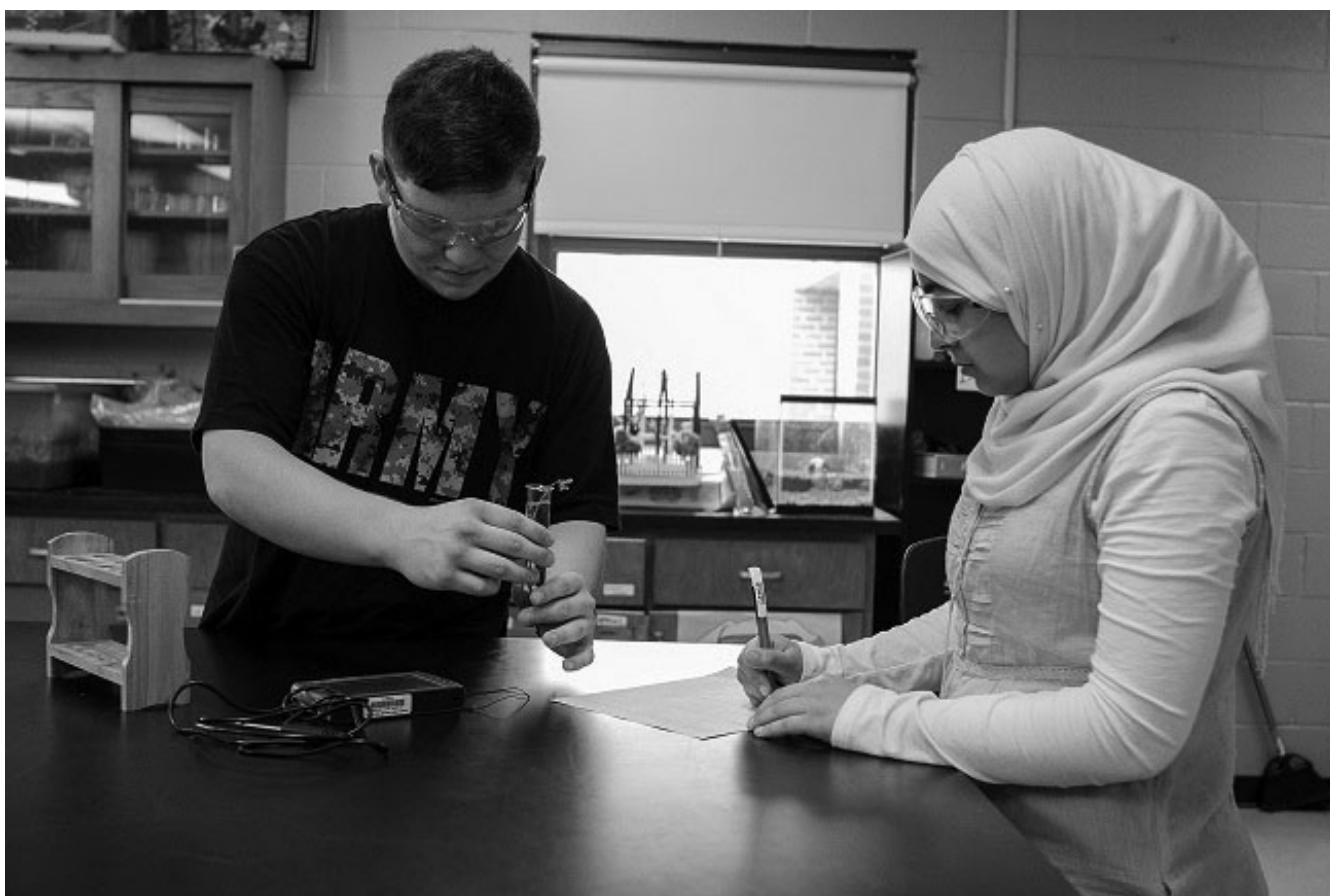


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Workforce Development and Credentialing Our Students

Preparing our Future Workforce through Agricultural Education

by John C. Ewing

The success of communities, states, and the nation rely on the workforce that is available to meet the needs of employers. The individuals that make up the workforce need to be prepared with the knowledge, skills, and dispositions that are needed at that time. In a time where we are being challenged to produce enough food and fiber to provide for an ever growing population, an emphasis needs to be placed on educating the workforce for agricultural careers.

Employees ranging from agribusiness personnel to agricultural mechanic technicians to agronomists (among others) are needed to meet the rising production, processing, and sales needs of the agricultural industry. These employees must be trained to enter the workforce so the food and fiber needs of our nation and world are met. These are just a few examples of the career opportunities awaiting our students. We must educate students to compete in a global market, and this should begin in the secondary agricultural education program.

All agricultural education programs are accountable for student learning, whether at the local or state level. State program approvals require that teachers and programs continue to meet the standards set forth within legislation. Often teachers are required to show how their programs are

contributing to academic standards, contributing to student career objectives, and ultimately college and career placement. As part of the mission of any Career and Technical Education program, agricultural education programs need to show how they are preparing students that are ready to enter Agriculture, Food, and Natural Resources careers. This focus on career development has always been important to agricultural education. Teachers and programs continue to be asked to provide evidence of student performance on program assessments, as well as certification and credentials that students can take with them following their high school education.

We can all agree that students learn technical skills through their agricultural education program, but they also have opportunities to practice and enhance communication, time management, team work, and leadership skills. Employers want to know that students are being prepared with skills that will benefit their company. Teachers that are able to partner with local agricultural businesses are often afforded the opportunity to grow their program, while providing access to potential future employees to the business. Through these partnerships there is an amazing opportunity for teachers to learn the most up-to-date information that can benefit their students, immediately.

In this issue of the *Agricultural Education Magazine* you will find information on all things “Workforce Development” related. Articles ranging from what it takes to incorporate the latest industry technology into your laboratory, to building partnerships with local businesses, to strengthen the local workforce, to “teacher internships” there is a lot to be learned from the information on the following pages. As you read, and reflect on each article, I challenge you to ask yourself how you can incorporate pieces of this information into your own program. Have you been struggling with a particular area of your program curriculum, or are you not up-to-date on the latest techniques utilized in the agricultural workforce? If you answered “yes” to either of these questions, take the time to see how others have successfully overcome these barriers for the betterment of their program, and ultimately their students’ learning.



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Cover: Photo courtesy of Beverley Flatt

“...be very successful in life...”

by Chaney Mosley

When preparing for this issue of The Agricultural Education Magazine, I couldn't help but reflect on my experiences in high school and look through my senior yearbook where there was a section for each senior to lay out his or her career plans. I read the aspirations of my classmates – a nurse, a Broadway star, a stockbroker – and smiled when I came across my name – an agriculture educator. Only a handful of my classmates achieved their goals, myself included. Though I have moved into other roles in education, I fondly recall the years I spent as an ag teacher and hope I was successful at preparing the future workforce of the agriculture industry.

Workforce development is a strategy that focuses on people, instead of businesses, to boost the economic stability of an area. While there are many approaches to workforce development, career and technical education (CTE) has emerged as a viable way for education to contribute to a local, regional and state workforce by creating pipelines for students to transition into the workplace or higher education. As we close out 2016 and move into 2017, the topic of workforce development and credentialing our students presents an opportunity for us to think about the purpose of CTE

and reflect on whether or not our programs are adequately preparing students for careers and college.

As agriculture teachers, we are specially trained to prepare students for success by providing guidance on agriculture specific postsecondary pathways, including credentialing programs, two- or four-year college options, or immediate entry into the workforce. At the completion of our programs, students should have something demonstrating their qualifications, achievements, personal qualities, or aspects of their background indicating they are competent and skilled in a particular area of agriculture. For some students, this might be an industry certification, for others, a portfolio or resume documenting what they know and are able to do. Many among the corps of agriculture educators are doing this quite well.

In assembling authors for this issue, it was important to ensure the voice of agriculture teachers, but also felt necessary that we hear from others involved with creating the future agriculture workforce. In addition to teachers, you'll read the musings of former FFA members, nonprofit organizations, an agribusiness recruiter, a state department of agriculture, and a farmer, all discussing strategies to prepare school-based agriculture students for successful employment in the industry. Each article

offers practical suggestions for the agricultural education classroom and you'll notice common themes throughout. The importance of partnerships, work-based learning opportunities, conducting needs assessments, soft skills and technical skills, and collaboration in a global society are mentioned again and again.

As I continued looking through my yearbook, I found a handwritten message from my own agriculture teacher. At one point he wrote, “you're a fine young man that will be very successful in life because you have the burning desire to be the best.” Those were kind words, but a lot has changed in the twenty years since I left high school. I have to wonder what types of messages modern day ag teachers write in student yearbooks. Hopefully, they read something along the lines of “you're a fine young person that will be very successful in life because you have the knowledge and skills needed in the agriculture industry.” In other words, our students will be successful because we have adequately prepared them for the workforce.



Dr. Chaney Mosley is an Assistant Principal at Nashville Big Picture High School in Nashville, TN

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Welding and the Workforce

by Kurt VanDeWalle

Sometimes great opportunities fall right into your lap or sound too good to be true, which was the case for the Fillmore Central Agriculture Education Program nearly ten years ago. Fillmore Central High School is located in southeastern Nebraska. Our rural school serves around 150 students in grades nine through twelve, and we offer a Power, Structure, and Technical Systems program of study consisting of three courses: Introduction to Agriculture, Food, and Natural Resources, Power, Structure, and Technical Systems (basic welding and small engines), and Metals and Fabrication (advanced welding).



Students from the first Metals and Fabrication course with two Reinke Manufacturing instructors, in front of the new welding booths with the shielding gas manifold and cylinders installed.

Not far from our school is Reinke Manufacturing, in Deshler, NE. Reinke Manufacturing designs, builds, and sells Reinke brand center irrigation pivots, which are the most common

method of irrigation in Nebraska and surrounding states. In 2008, Reinke Manufacturing had the foresight that when the economy improved, there would be a need for more welders. So, the Public Relations Manager and one of the plant's welding instructors came to Fillmore Central and asked if the program could use eight new welders.

What's the catch?

What welding program would say no to that question? My inclination, though, was to wonder what the catch was. At the time, we had four Gas Metal Arc Welding (GMAW) welders, four Shielded Metal Arc Welding (SMAW) welders, and four oxygen-acetylene (OA) welders. The addition of eight more welders created an opportunity for the addition of a Metals and Fabrication course, which allowed us to prepare students for the American Welding Society (AWS) qualification test.

Now, in the eighth year of partnering with Reinke Manufacturing, it is obvious there is no catch. Reinke Manufacturing wanted the students to not only have more welding experience and education, they also wanted them to use equipment that matched industry standards and provide them the opportunity to be tested in the American Welding Society D1.1 weldment and bend test. Ultimately, they wanted to grow their future workforce!

New Equipment

Reinke Manufacturing donated eight ESAB brand GMAW welders. Four were dual-feed, meaning they have two wire feeders and two whips. Currently, these welders are set up to do steel welding on one side and aluminum welding on the other side. The other four welders are set up for steel welding only. All of the welders can be set up for both short circuit metal transfer and spray metal transfer. Reinke Manufacturing employees also designed and built eight new welding stations for the high school. Each booth measured 5 feet wide and 4 feet deep with a work surface that was 5 feet wide, 2 feet deep, and 3 feet from the floor. The remaining 2 feet of depth allowed enough room for a student to weld with an instructor providing guidance. Praxair, a welding consumable supply company, donated the materials and labor to install a manifold shielding gas system and curtains that hang behind the welding students to block the UV rays that come from the weld and protect students outside of the welding booth.

Teaching the Teacher

In order for me to prepare students for the test, I spent three days at the Reinke plant during the summer to go through some practice joints and then took the qualification test myself. During my time at the plant, I passed the American Welding Society (AWS)

D1.1 qualification test, and since then have taken two college level welding classes. One class was to improve my steel welding skills so I could better prepare students for the AWS D1.1 test. In the other class, I learned how to aluminum weld so the new welders used for aluminum welding could be utilized.

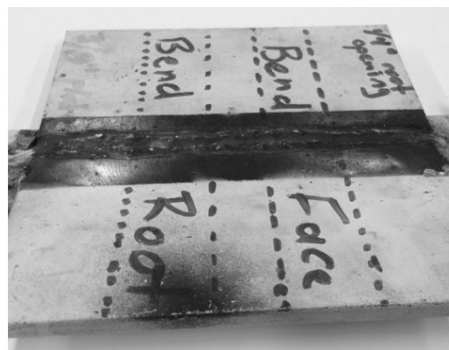
Preparing the Students

Students must successfully complete a basic welding course before enrolling in the Metals and Fabrication course. The basic welding course prepares students to weld SMAW, OA, and GMAW, and cut metal with an oxygen-acetylene torch, plasma cutter, chop saw, and shear. General welding information is also taught in this course. In the Metals and Fabrication course, students go deeper, learning why different variables affect welds in different ways and why welds need to be made to certain specifications. The advanced course also requires students to review and brush up on their GMAW short-circuit transfer welds and introduces them to the GMAW spray-transfer welds.

Qualification Test

The AWS D1.1 test weld uses a spray-transfer and consists of welding together two 1/4" by 4" by 8" mild steel plates which are bevel cut at 22 degrees on the 8" side. Spray-transfer requires a minimum of 25 volts and approximately 225 amps, which melts the welding electrode wire before it touches the metal, which is hotter than the more commonly used transfer method, short circuit, in

which the welding electrode wire touches the metal and then melts. The plates are placed 1/4" apart with a backing plate underneath the plates. The back plate is tack welded to the beveled plates and is later removed before the test specimens are bent. This groove weld requires the welder to weld several passes of bead to fill the groove. Each bead must fuse together and to the plates properly. The groove must be filled completely, with less than 1/32" underfill, no undercuts, and less than 1/8" excess buildup. After students have practiced in class, a Reinke Manu-



The dotted lines indicate where the two strips will be removed. One strip will be bent towards bottom of the weld to expose the root for inspection. The other will be bent towards top of the weld to stretch the final weld beads to check for strength.

facturing instructor and inspector comes to Fillmore Central to conduct the tests at no cost.

The weld must first pass a visual test, which includes consistent width and height and is within the limits of the underfill, undercuts, and excess build up. Test plates that pass the visual are then cut. Two 1 1/2" specimens are cut from the middle of the weld, two inches from each end. The cut

strips, called specimens, have the backing plate cut off and are then placed in a bender. One of the specimens is bent to expose and



Two resulting bends from one test. The bend on the left shows the face of the weld. The bend on the right shows the root of the weld.

stress the root (first passes). The other is bent to expose and stress the face (top of the weld). The resulting bent specimens are called bends, which must then pass a visual and measurement inspection. Any bends that have cracks, pits, voids, or otherwise breaks will fail the bend. Both the root bend and face bend must pass the inspection in order for the student to pass the test.



The face bend on the left passes inspection but the root bend on the right shows how the two root beads cracked away from each other when bent, resulting in a fail since the root beads were not fully fused together.

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The bends are returned to the students, whether they passed or not. Students who pass receive a certificate and card to prove their qualification of passing the test. Students that do not pass have the option to complete the test again. Having the welding certificate allows students to demonstrate they are capable of welding to industry standards. This obviously gives them an advantage when applying for a job after high school.

Student Results

During the seven years of the partnership with Reinke Manufacturing, 71 students have completed the test with 27 students passing the test (38% passing rate). Six students went on to further their welding education at community colleges or technical schools and one directly entered the welding workforce. Three students completed their education and are currently in a career that is predominately welding. The test is rigorous, evidenced by the pass rate, but the opportunities after are rewarding, with the average starting wage for skilled welders in our area being \$20 per hour.

Lessons Learned

The partnership with Reinke Manufacturing has been invaluable. The equipment and facility improvements help our school stand out among other schools of similar size and give students an opportunity to learn a level of welding rarely offered at the high school level in Nebraska. Even when students do not pass the qualification test, their welding

skills surpass those who have only received basic welding instruction.

The equipment donation did present challenges early on, such as learning how to use the new welders and the required qualification weld parameters such as voltage, amperage, travel speed, work angle, and travel angle. Another challenge was having an adequate amount of thick metal for students to practice on for the test. This challenge has been significantly reduced since Reinke Manufacturing provides scrap metal, as long as it is returned to the plant for them to recycle. Thinner scrap metal is also “borrowed” from a local welding shop and a local steel tubing manufacturer, which is used for the short-circuit transfer welds.

We maintain a positive relationship with our partner by recognizing them publicly with awards, such as the FFA Outstanding Service Award, taking students on tours of the plant, and communicating early with welding inspector when scheduling scrap metal exchanges and welding examinations.

Other agriculture programs could establish similar arrangements by approaching local manufacturers and discussing how your program could help develop a skilled labor force for them by providing assistance and expertise for your students. Directly asking for financial or equipment donations should not be the first move. Instead, begin by inviting a potential business partner to visit your

program, request for someone to be a guest speaker in your class, or ask to bring a group of students for a tour of the facility. Build the relationship, and the donation may come later, but when it does, be prepared for your own personal investment. Like me, you’ll find yourself working alongside your partner to enhance your own skills and taking additional courses so that you can better serve your students.



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Partnerships, Pathways, and Pipelines

by Beverley Flatt and Jessie Lumpkins

The global population is expected to reach 9 billion people over the next 30 years, which begs the question, how will we feed the growing world? How will we conserve the land? How will we handle the changing climate and weather conditions? Most importantly, how will agricultural education ensure a steady supply of skilled individuals for a changing labor market? In Metro Nashville Public Schools (MNPS), we use regional workforce development and economic indicators to answer these questions.

In January 2016, the Office of the White House released “An Agricultural Workforce for the 21st Century” stating:

“the United States faces a predicted agricultural workforce shortfall of as many as 100,000 jobs in food and agriculture lacking appropriately trained professionals to fill them over the next five years. In addition to needing more agriculture professionals, the United States also needs professionals with broader training that integrates agricultural sciences and other STEM disciplines.”

There are many ways to address this problem, and in Nashville, school-based agricultural education is the approach yielding success. By accessing regional

workforce development and economic indicators, any community can replicate the process we use to make informed decisions about the programs of study being offered in the local school system. While not all of the steps are simple, they are worthwhile when it comes to having a plan to educate our community and feed the world.

Backing It Up With Numbers

Annually, we partner with our local Chamber of Commerce in a workforce study of the region which looks at job growth predictors for the next ten years. This partnership allows the Chamber of Commerce to meet their mission of balancing the talent needs of employers with the availability of a skilled workforce and the MNPS system to address their vision of preparing every student for college, career, and life. In the 2015 workforce study, the Nashville Area Chamber of Commerce highlighted a 28 percent increase in the demand for agriculture, agricultural operates, and related sciences in the Middle Tennessee region. The demand specifically aligned with veterinary sciences, urban agriculture, plant and animal biotechnology, and alternative energy and fuel systems. The growth in job opportunities for these fields was staggering. Further, the study indicated one in five employees in Middle Tennessee will retire in the next five years - a trend that will be common across the United States. If your local or regional Chamber of Commerce

cannot provide workforce development information, the United States Department of Labor and the Bureau of Labor Statistics can offer supply information on market trends as well. While numbers are important, they do not tell the entire story.

More than Numbers

In order to provide anecdotal evidence in addition to data gathered from the workforce study, we gather a group of industry professionals to contribute to the discussion. After a short presentation about study results from the Chamber of Commerce, the group of industry representatives discusses how to use data to inform the career and technical education (CTE) programs of study that will be offered in MNPS for the following school year. This group is comprised of individuals from higher education, local farmers, scientists, and other professions that depend on agricultural products to prosper such as LP Building Products and the Nashville Electric Service. The group develops recommendations for the district to consider in terms of adding pathways, changing courses, pursuing agriculturally related industry certifications such as the Beef Quality Assurance certification, OSHA 10, or herbicide and pesticide application certifications, and other aspects that impact the future of the agricultural industry. These recommendations are considered by senior leadership in the school system and final decisions must be

explained to the business partner advisory group. It is a wonderful system of checks-and-balances in our local education system that has provided a voice for all stakeholders and modernized our agricultural education program offerings to ensure we are meeting the needs of the local workforce.

Because of the system we have in place, agricultural education has grown by leaps and bounds over the past six years. In 2010, MNPS had three single teacher agricultural education programs that were under-enrolled and on the verge of elimination. Today, there are four thriving programs employing nine agricultural education teachers with many classes filled to capacity.

In and Out of the Classroom

The words “Learning to Do, Doing to Learn, Earning to Live, Living to Serve” can be found in many agriculture classrooms across the nation. Agriculture teachers are charged with translating ideas and skills into practical application that mimics the world of work. Whether we major in education or become alternatively licensed, years inside the walls of a classroom could mean we begin to lose touch with industry trends. Having industry partnerships gives teachers a permanent connection to the in-demand job opportunities aligned with our agricultural pathways or programs of study. While some pathways may boast many different partnerships, it only takes one great connection to provide students with world-class, hands on learning experiences.

If you were to take snapshots of a years’ worth of interaction with our partner Flatt Rock Farms, you can find owners Bev and James Flatt involved in a multitude of projects at McGavock High School. Rather than simply supplying materials for projects or providing financial support, this industry partner provides work-based learning opportunities through classroom guest speaking appearances, industry specific field trips and job shadows. This past September, Bev spoke to the Large Animal Science class about management practices and the risks and benefits of farm diversification. Students then prepared questions and learned how to interact while on a job site, to prepare for our industry field trip to Flatt Rock Farms that occurred in November. While there, students rotated through stations with dif-



Students in the veterinary science pathway tour Flatt Rock Farms, a business partner, and learn about livestock management practices, including goat castration.

ferent livestock where they interacted and discovered answers to questions they first generated in the classroom. So often we think “Learning to Do” might come from a textbook, but even the first line of the FFA motto can be carried out in an interactive way while lending itself to the second line of

the motto – “Doing to Learn”. For example, observing a goat castration at our partner farm prepared students to carry out this management practice on the goats at our school farm, which happened within two weeks of the visit.

After the industry field trip, students also learned the importance showing professional gratitude by writing thank you notes to our partners. While many connections end with a thank you card, this is just another launching point for this important relationship. Bev and James are in our classroom frequently – they drop off bedding, judge chapter level FFA competitions, and provide feedback on student work completed through project based lessons. The most valuable part of the partnership is the confidence gained by students through their connection with true agriculturists. When preparing an Agriscience Fair project, when searching for internships or volunteer hours, when in need of a first person resource for a research assignment and much more, students are comfortable and enthusiastic about asking our industry partners for help. There is no doubt that every aspect of the 3-circle model is enhanced tenfold by having such dedicated and knowledgeable business partners.

To Postsecondary Pursuits

The pre-veterinary science pathway at McGavock High School exposes students to topics and skills in health and disease, basic animal care and nursing, clinical and laboratory procedures, and the anatomical/ physiological systems of a range of small and large

animals. Students in this program have the chance to work with real large and small animals, ranging from alpacas to hedgehogs, in the school's menagerie which boasts a new barn and grooming facilities. On any given day, students may be candling eggs from the chickens



After the field trip to Flatt Rock Farms, students create mock goat scrotums using balloons, cotton balls, q-tips and jello to simulate a lifelike model that can be cut or banded.

and ducks, castrating livestock, caring for foster kittens, or taking vital signs of the rabbits. These experiences have led many students without a workable plan for an SAE at home to fulfill their hours before and after school in the lab or on the school farm. This exposure has also led to internships at the Nashville Zoo and surrounding veterinary clinics, with potential for more as new partners are added to our advisory board. The workforce development study indicates a need for animal trainers, veterinary technicians, and veterinarians in Middle Tennessee that can be filled by students enrolled at McGavock. Employers such as Mars, Inc. pet food division and research and development lab, regional livestock producers, the zoo, pet supply stores, boarding and grooming kennels, animal hu-

mane shelters, and related industries such as medical laboratories in Nashville have a pipeline of students to move on to postsecondary education programs required to fill their vacancies.

The voices of the business partners and economic indicators have been so powerful, the school's principal decided that every high school freshman in the building (approximately 800 students) would enroll in agriscience rather than physical science, regardless of the CTE pathway they will ultimately pursue. This means every student who graduates from McGavock High School, the second largest school in Tennessee, has at least one year of agricultural education.

The Future of Agriculture

Because of our pathways and partnerships, the opportunities available to our students are personalized for students and create a pipeline to related postsecondary education and career pursuits. Our education system is truly focused on workforce development for the agriculture industry. While all students will certainly not enter agricultural fields, we are confident that they leave our program with a foundation of knowledge and skills necessary to become the problem solvers, innovators and policy makers that will feed the planet, conserve our resources, and battle climate change.



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Crazy about Co-op: Best Practices to Create a Successful Work-Based, Cooperative Education Program at Your School

by Jay Solomonson

Five years ago my administration asked me if I would be interested in taking over our school's interrelated cooperative education program. For those of you who are unfamiliar with cooperative education, it can best be described as a structured, experiential learning work-based experience combined with classroom instruction in a student's chosen career field.

The previous "Co-op" teacher was retiring at the end of that academic year and the school district wanted a current staff member to absorb those teaching and administrative responsibilities. Reluctantly, I agreed to take on the additional class on top my existing workload. I knew to be successful juggling the various tasks of this new job, I would have to be innovative in managing my time as well as establishing policies and procedures that would enable students to have a positive, worthwhile work-based experience.

I experienced a huge learning curve that first year, but we got through it. Then, I rewrote the curriculum and updated the on-the-job training policies and procedures. Since that time, we have worked through kinks in the program and it has evolved to become one of the most sought-after classes. The following are best practices I would recommend

to those either planning to start a cooperative education program or looking to revamp or revitalize an existing program. While some of the following may not be feasible in your situation, they have definitely helped shape our cooperative education program to one of the most respected programs in our school and community.

Require that potential students apply and interview for a spot in the program.

All of the students that wish to enroll in the cooperative education program at our school have to complete an application, obtain three references, and interview with myself and our guidance counselor. I believe that participation in Coop is a privilege and if a student is genuinely interested,



CTE Trivia Night that the Cooperative Education Students hold annually every year generates funds needed to support community service efforts and pay for the Employer Appreciation Banquet.

s/he will take the time and effort to perform the tasks needed to be admitted to the program. Since our school limits the number of students that can participate in the program (20 students), it is a very competitive process and an honor to be considered a part of it. The selection committee takes into account the student's attendance and disciplinary record, GPA, application, references, and the responses to their interview questions.

Students should only secure employment in their desired career field.

When students fill out their enrollment application, they are specifically asked what types of careers or career fields they would like to enter after completing formal education. The goal is for the cooperative education student to procure employment in that particular field. This will allow students to gain practical experience in an area of interest and help determine if it is a career they would want as an adult. We do not allow students to obtain employment in a field or industry they have no desire to enter after graduating (i.e. working at a fast food restaurant- unless that is their desired career field). As the cooperative education coordinator it is my job to help students find positions in their field of interest, but is ultimately up to them to apply, interview, and secure employment prior to the start of the next school year.

Have a mandatory parent meeting and require all parties involved to sign a training agreement and memorandum.

After the students are selected for the program, their parents are required to attend a mandatory meeting. At this meeting, we discuss the components of the program as well as policies, procedures, and requirements for both the classroom portion and the on-the-job training piece. We also cover tips on securing employment and important deadlines students must meet. Our program also requires all parties involved complete and sign a training memorandum, training agreement, and transportation waiver. A registered notary is on site to ensure all required forms and paperwork are signed by students and parents. Employers sign the paperwork after the student has been offered employment.

Have adequate supervision time and conduct regular site visits.

Make sure your school administration provides adequate time for supervision as well as time to physically go out and make site visits at your students' employment locations. In my state, the school code (educational laws and policies set forth by the state legislature) indicate that a cooperative education supervisor should receive a half hour per student, per week for supervision. I recommend reviewing your state's policies before negotiating that time with your administration. School districts should always provide either release periods for making

visits or some type of monetary compensation if the supervision occurs outside of school hours. Currently, my district offers one supervision period and a stipend to compensate for the time required to complete the coop duties beyond our regular contract.

Every nine weeks, have both employers and students complete a job performance review.

At the end of each nine-week period, I require all employers fill out a performance evaluation on their coop student. This essentially turns into the grade for the on-the-job component of the program. The performance review form I utilize asks employers to evaluate the student on criteria including attendance, punctuality, dependability, trustworthiness, attitude, work habits, and abilities, among others. I encourage all of the employers I work with to sit down and discuss the evaluation with students. This is an excellent opportunity for students to learn and grow personally and profes-



Cooperative Education students participating in a community service project where they helped plan and execute a food drive that acquired 8,600 pounds of food donated to the regional food bank.

sionally. A week after the employer submits the evaluation, I have the students complete a self-assessment using the same evaluation instrument and we sit down to discuss both evaluations and how the student can improve work habits. I have found these student conferences and reflective pieces to be an invaluable component of the work-based experience.

Require a year-long classroom component to the program.

While some schools may only have the on-the-job component of the cooperative education program, our district requires that all students involved be concurrently enroll in a year-long cooperative education course. The classroom portion focuses on self-assessment, career exploration, finding a dream job, developing an effective résumé and cover letter, interviewing, workplace ethics, development of leadership skills and personal finance. This course also meets the consumer education graduation requirement. By having an actual sit down class, it not only allows me to see and communicate with students daily, but it is also a great way to reinforce concepts and habits they learn in the workplace.

Students should join and actively participate in a related student organization.

Since we have an interrelated program in our school (not all students are in agricultural education), I could not require these students to join and participate in FFA. So, we created a student or-

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Cultivating Careers through Work Based Learning

by Greg Schneider

There is a fine line between being in a groove and being in a rut. Whenever I find my teaching leaning towards the latter, I look for new ways to invigorate my passion. Recently, I found a new passion in work based learning (WBL). WBL is an experience in which students meet real world challenges in an actual work place setting within their chosen career path, usually for high school credit, and can be a paid or volunteer experience.

WBL is good for the agricultural industry. By creating a pool of qualified candidates that have a verified list of skills, we are keeping our agricultural industries strong and growing. WBL is good for the local

community. The vitality of youth keeps a community progressive. By inspiring our young people to return to live and work in our community, our community remains vibrant. Most importantly, WBL is good for students. It gives students the opportunity to explore career options before investing in post-secondary education and also gives them a skill set and experiences that will facilitate premier leadership, personal growth and career success.

I teach at Greensburg Community High School in the heartland of Indiana. The vast majority of our school's 700 students come from a non-agriculture background. Production agriculture in Decatur County is a major contributor to the local and state economy. Greensburg, with a

population of 12,000 residents, is headquarters to several small to mid-sized agricultural companies that serve production agriculture in the tri-state area. We are in grain country - soybeans and corn are big business. Modern pork production is also a mainstay with a large dairy and scattering of beef cattle finishing operations and small scale livestock producers as well.

Developing the Future of Agriculture

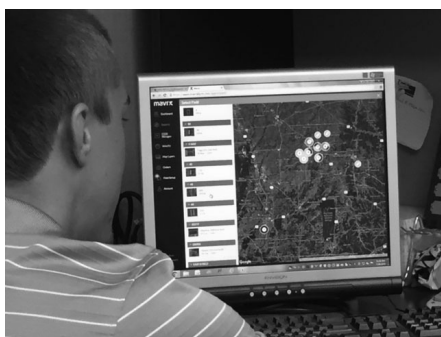
I believe the future of agriculture hinges on students that do not come from an agricultural background. My number one goal as an agriculture teacher is to inspire these students to consider the wealth of possible career fields that support production agriculture.

Name of Company	Type / Description	Skills Developed
Lowe's Pellets & Grain	Locally owned feed mill that produces pelletized feed and sells to a tri-state area	<ul style="list-style-type: none"> • Sales • Animal Nutrition • Feed mixing • Warehouse Mgmt
Mier Farms	Diversified grain farm that raises Pioneer crop seed and popcorn	<ul style="list-style-type: none"> • Equipment operation • Grain Elevator Mgmt • AgriBusiness Mgmt
Trax Crop Mgmt Systems	Agronomy division that supports the local seed & chemical co-op retailer	<ul style="list-style-type: none"> • Pest/Disease ID • Nutrient testing • Crop Scouting
KOVA	Agricultural Chemical Company with retail and whole sale and application services	<ul style="list-style-type: none"> • Safe Material Handling • Precision Ag Technology • Global Marketing
Smith Implements	John Deere dealership with six locations in Southeastern Indiana	<ul style="list-style-type: none"> • Service • Sales • Parts mgmt

Skills Matrix: This skills matrix explains the type of businesses where I interned as a teacher and the skills I developed at each location.

Within our immediate community, students can secure employment as service technicians, agriculture salespeople, agronomists, equipment operators, and animal health and nutrition specialists, among others. The list of opportunities literally goes on and on.

I have always worked to actively engage my program with the local community and agriculture industry visits are a regular use of my extended contract. This past spring, the Indiana Department of Education (IDOE) offered a summer program called “Teachers in Industry”. This program provides teachers with a paid internship in a local company for up to 100 hours to learn more about that particular facet of industry. I saw this program as a golden opportunity to learn more about the agricultural industries that support the local economy so I could better tailor my curriculum to prepare students to enter the workforce right after



Mastery of technology and computer skills play an important role in today's agriculture industry.

graduation or after their post-secondary education.

After securing permission from IDOE to deviate slightly from the program of spending 100

hours at one location, I instead spent 8-10 hours at as many different agriculture related jobs as I could arrange. My primary goal was to establish five agricultural industry internships within the 7-week summer break and learn the skills needed by the employers. My secondary goal was to secure agreements for future student job placement opportunities. I found very willing partners in our local agriculture industry. As a matter of fact, I ran out of time, before I ran out of opportunities.

From Industry Experience to Work Based Learning

For WBL to be truly successful, it should be part of a declared career pathway. IDOE required that I create a student training plan for each location I shadowed. In this plan, I identified agriculture course standards that would be addressed in the different career fields and skills required for successful participation in those careers. I also created a four year plan of courses a student would take to prepare for each career. In our school, WBL internships are offered to upperclassmen. I don't want my students entering an internship without some background information and a bank of knowledge. I discovered I also don't want to limit this background to just agriculture classes. For example, public speaking and basic computer skills were identified by employers as universal needs, more advanced computer programming classes are helpful for jobs involving technology, and biology and chemistry courses are

helpful in many jobs that involve crop and/or animal science.

Each training plan also includes the cadre of related FFA career development events and experiences that would help prepare a student for a given career field. When properly used in conjunction with classroom instruction, opportunities through active participation in FFA activities are meaningful proving grounds for preparing students for career success. My goal for each student is to create a powerful resume that will place the student on the top of a job candidate list. In addition to technical skills, I also work to provide the students with experiences that help them develop interpersonal skills so they can convey their knowledge in an interview. Employers want to hire candidates with people skills that can communicate effectively and engage with the public. They want to see a good first impression - every time. They want an employee with a work ethic that is a self-starter and a productive worker.

Employers recognized that the key to creating long-term employees that are dedicated to the company and the community is to hire from within the community. Employers can recruit qualified graduates from other outside programs that will fill the employment needs, but if the employees are from another community, they will generally leave to return to their home community. This translates into lost time and money invested in employee training. As the agriculture teacher, it is my responsibility to prepare our students for these

career opportunities and support our local agricultural industry.

My “Teachers in Industry” experience resulted in a new agriculture internship course being developed for our students. First, during the summer after the junior year of high school, students participate in a paid internship program. We have several local agriculture industries and farming operations that agreed to host students for two-week intervals for a total of four placements over an 8-week period. The idea is for the student to experience a variety of agricultural career fields. All employers understand that in this two week period, the student will not become an effective em-



The demand for skilled workers is high, including for heavy equipment operators.

ployee, but rather, the purpose for this time is for students to explore different agriculture careers. The following senior year is when the student will declare an interest and enter into a dedicated WBL internship with the company of their choice. This course is for high school credit, with release time from school as well as the opportunity to work after school and weekend hours. While the

cost of the paid summer employment is supplemented by our local Community Foundation, the full cost of the dedicated school year WBL is covered by the respective employers. During this time, the students hone their skills and become valued employees. A student training plan is written and follows the student throughout the experience. A mentor is assigned to the student by the host site, and as the agriculture teacher, I conduct regularly scheduled job site supervision visits.

Stumbling Blocks

Even in a perfect scenario, there are roadblocks and challenges. The most prevalent one we have found is age restrictions on equipment operation. Many companies require employees be 18 years old to operate equipment. In some cases, employees have to be 18 years old to be hired. We discovered an educational clause in the labor laws here in Indiana that will allow some exemptions, but even with this information, it requires an industry partner that sees the value of figuring out how to make things work. In most cases, these concerns can be mitigated through student mentorship and effective supervision. It is also important for the employer to feel like there is communication and support coming from the school. Establishing and maintaining relationships between industry and the WBL supervisor is paramount.

I believe in the future of agriculture and I am confident that

by providing experiences through WBL, we are insuring a bright future as the next generation of agriculturalists take on the challenge of feeding the world. Based on my experiences, I offer the following five steps to creating a successful WBL internship program:

1. Establish relationships with industry partners.
2. Identify local employment needs & align with program course offerings.
3. Access resources and create a state approved curriculum.
4. Match proper mentor/mentee partnerships.
5. Maintain job site supervision and support.

I am proud that agricultural education can play such an active part in preparing the future workforce for our industry. If you find yourself in a rut, perhaps a WBL program will help you get your groove back!



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Global Workforce Development: Are Your Students Ready?

by Marcus Hollan and Ebony Webber

To be more successful, agricultural businesses and organizations across the country strive to develop employees to work more effectively with colleagues from other cultures. It makes sense when you consider our industry produces, markets and delivers agricultural products via a multicultural workforce to a multicultural consumer force. In fact, multicultural consumers (members of social minority groups) are predicted to become a majority of the United States population by 2044, which means the majority of the United States workforce will also be multicultural. Are your students ready for employment in a global economy?

Consider This

You take a group of students the National FFA Convention. They enjoy being away from home, touring the city, and eating meals with linen napkins, describing the experience as “epic”. During a convention session, a photo appears on the screen in which a student wears a shirt prominently displaying a confederate flag. While most of your students aren’t phased, one person, an African American sophomore sits dumbfounded. You know there are various opinions of what the

flag represents, but to her, you know it means one thing. Though she doesn’t say anything, after the session you have the opportunity to engage in a teachable moment for all of your students. Do you do it?

One of your students is a member of the Seventh-day Adventist world church and is also a member of a winning regional Career Development Event team. The next competition is on a Saturday, but this student’s religious beliefs do not support his participation in a purely secular activity on a Saturday. Another student is a member of Jehovah’s Witnesses and is elected to serve as the chapter President. Her religious beliefs do not support her saluting the American flag or reciting the Pledge of Allegiance; however, according to the FFA manual, this is part of the President’s role in the opening ceremonies. What do you do?

In your classroom sits a young student exhausted from a weekend of harvest with a pile of chores waiting for him at home after football practice. His life is the farm, school, football and FFA, all things he loves, but at night he cries himself to sleep. He’s very conscious of how he walks, talks, and interacts with classmates as well as the homophobic slurs he hears throughout the day, but has reached the point in life where his identities are not synched – his rural American cultural identity and

his sexual identity. Because he trusts his FFA advisor, he has the courage to tell you he is gay. Your response will make a difference in the trajectory of his authentic life. How do you respond?

Being Older than the Rest of You

FFA advisors are asked to advise their students from time to time, as the need arises. Between racial/ethnic identity, faith/religious identity, and sexual/gender identity, agriculture teachers will encounter students from many different backgrounds. In other words, your students are multicultural. How you teach is nearly as important as what you teach. After four years of taking agricultural education courses – will all of your students be ready for the global workforce, identifying the agriculture industry as a viable option for postsecondary study and employment, and prepared to work alongside people from a different background than their own? The mark of the profession’s success is where students end up in the workforce and how they interact in a global environment. We believe instruction that is woven within the framework of diversity and inclusion (DI) will help prepare students for success in their chosen agricultural career paths.

The George Washington University defines diversity as the individual differences (e.g. life

experiences, learning and working styles, personality types) and group/social differences (e.g. race, socio-economic status, class, gender, sexual orientation, country of origin, ability, intellectual traditions and perspectives, as well as cultural, political, religious, and other affiliations) that can be engaged to achieve excellence in teaching, learning, research, scholarship, and administrative and support services. Inclusion is the active, intentional, and ongoing engagement with diversity -- in people, in the curriculum, in the co-curriculum, and in communities (e.g. intellectual, social, cultural, geographic) with which individuals might connect. Think about your daily instruction an interaction with students and do a quick DI assessment of your learning environment:

- Do the posters on the walls represent the diversity of the people in agriculture and the diversity of your students?
- Is the verbiage you use when teaching inclusive of gender and sexual identities?
- When political and social topics are brought up, do you only provide your personal, one-sided perspective?
- Do you allow phrases similar to “hit like a girl”, “Asians are good at math”, “jew down”, or “that’s gay” to be used by students?
- When racial slurs are overheard in the halls, do you correct students?

- When you observe low-socioeconomic students being bullied, do you intervene?
- When a student says “organic farming is not real agriculture” during class, do you open the floor for discussion of other viewpoints?

It turns out the need to advise students on multicultural awareness arises frequently. Your classroom is the safe zone for many students. In some cases, you are the other parental voice for students. What you say and don’t say during a teachable moment impacts far more than just a single outcome. Teachers set the standard for how students continue to live, think, and develop as young adults and later in life as professionals. How you react to situations will cause a ripple effect for years to come. Ultimately, what and how we teach our students will determine their employability, both in securing a job and keeping a job.

Are Your Students Employable?

A culturally responsive and inclusive classroom is not a new concept to agricultural education, nor is preparing students with knowledge and skills needed by employers. In addition to acquiring knowledge and developing skills necessary to perform a job, students also need preparation that ensures they stay employed in a changing economy. Sound preparation for holding a career involves providing experiences that engage students’ minds and hearts in a world of diverse people, be-

liefs, and experiences. It’s not enough to say we think diversity and inclusion is a good idea, but students should also be equipped and prepared to be supervised by, work alongside, or supervise people who are culturally different from themselves. How do you provide this type of preparation for students?



Panel Discussion: The Cultivating Change Summit Fireside Chat Panel Discussion showcased agricultural companies and organizations who are working to increase the visibility of diversity and inclusion in the agriculture industry.

Whether we like it or not, or agree with it or not, there are numerous laws governing the treatment of marginalized populations in the workplace. Among these are the Civil Rights Act, the Equal Pay Act, the Age Discrimination in Employment Act, the Americans with Disabilities Act, the Rehabilitation Act, the Genetic Information Nondiscrimination Act, the Civil Service Reform Act, and the Uniformed Services Employment and Reemployment Rights Act. Many states and municipalities have enacted protection from discrimination based on sexual orientation, status as a parent, marital status and politi-

cal affiliation. Each of these laws prohibits a variety of discriminatory practices. As a career cluster in career and technical education, agriculture classrooms should often mimic and simulate the world of work. One way to prepare stu-



MANRRS Conference: Graduate students networking at the 31st Annual MANRRS Conference in Jacksonville, FL.

dents for maintaining employment is to use the teachable moments highlighted above as opportunities to educate about workplace discrimination laws. In addition to informing students about their rights and protections as employees in the working world, teaching about workplace discrimination laws also helps students understand the repercussions of violating the laws. A culturally responsive and inclusive classroom does not tolerate actions and behaviors prohibited under these laws, but only the teacher can create such a classroom environment.

A Tale of Two Organizations

Teachers are expected to act as experts of many topics, which is challenging. Luckily, two organizations exist that can support agriculture teachers in supporting students - Minorities in Agricul-

ture, Natural Resources and Related Sciences (MANRRS) and the Cultivating Change Foundation.

The mission of MANRRS is to promote academic and professional advancement by empowering minorities in agriculture, natural resources, and related sciences. As a national society that welcomes membership of all racial and ethnic group participation, MANRRS provides professional development for high school, collegiate, and professional minorities within agriculture education and the agriculture industry. From local high schools and collegiate programs to a national platform, MANRRS is single-handedly changing the landscape of the diversity in agriculture and providing young minority students the ability to feel welcomed, connected and affirmed in the agriculture industry.

The Cultivating Change Foundation is aimed at valuing and elevating Lesbian, Gay, Bisexual, Transgender, and Questioning (LGBTQ) agriculturists through advocacy, education, and community. The Cultivating Change Summit, a capstone of the Foundation, brings together LGBTQ agriculturists (and allies) for a unique professional development conference. The purpose and goals of the Cultivating Change Foundation is to have a space to share strategies and best practices to create LGBTQ agriculture-industry equality, inclusive of all sexual orientations, gender identities, and expression. In doing so, the Cultivating Change Foundation & Summit impacts the following.

We offer the following ways you can help prepare students for the workforce, while creating a culturally responsive and inclusive classroom:

1. **Be Intentional.** Look for ways to bring students together in groups, teams, field trips, etc. Be intentional on who you are recruiting to your programs. Teachers don't wait for culturally responsive and inclusive environments to evolve – they make it happen.
2. **Immerse Yourself & Ask Questions.** If you don't know what it's like to be in cultures and environments different from what you know, put yourself in situations that immerse you into a different culture. Ask questions about things you do not know and be open to learning and seeing the world through a different lens. Both the MANRRS Organization and the Cultivating Change Foundation are great places to look to for resources and support in helping you better serve your students.
3. **Right the Wrongs.** If you hear something or witness something that does not create an inclusive environment, have the courage to intervene. Teach your students why something is not okay and the consequences of their actions.

We don't have all the answers, but we do believe there are many opportunities to make a difference for all students and prepare young people to be thoughtful, educated

and inclusive individuals. Your students will be leaders in the agriculture industry and other career areas where acceptance and tolerance will be a catalyst for getting hired and fired. As our nation and world continues to grow faint of our agrarian roots, we cannot afford to exclude students (intentionally or not) from giving their hearts and talents in order to elevate the food, fiber, and natural resources industry.



Marcus Hollan, Executive Director, Cultivating Change Foundation



Ebony Webber, Chief Operating Officer MANRRS

Crazy About Co-op (Continued from page 12)

organization exclusively for those students enrolled in the cooperative education program. We called this organization the Cooperative Education Club of Orion (CECO). The purpose of CECO is to provide an opportunity for the working student to become engaged in service activities at school as well as in the community. The learning experiences through this organization are designed to promote growth in leadership, scholarship, citizenship and occupational knowledge. The group elects officers, has quarterly meetings, conducts two community service projects and a fundraiser, and hosts an end of the year banquet. These experiences allow our coop students to be visible within the community and help promote the program to potential employers.

Host an End-of-Year Employer Appreciation Banquet.

At the end of the school year, students plan and host an employer appreciation banquet for their bosses. We typically rent a banquet hall or room at a nice

restaurant and provide the meal for supervisors. This is paid for with the money generated from our fundraiser. During the banquet we give out several awards including the CECO Award of Merit (Outstanding Coop Student), Distinguished Service Award (Employer of the Year), and the Distinguished Alumni Award (for a graduate of the program who has done great things in his/her professional career). We typically invite our Distinguished Alumni Award winner to speak and share some words of wisdom with the students about the workforce. These activities help students by expanding their professional network within our community. Our students' employers appreciate this event and it is an excellent way for the students to show gratitude to their training site for allowing them the opportunity to work there.

Final Thoughts

Cooperative education programs are a great mechanism for supporting the economic and

workforce development needs of a community. They provide local employers with a dependable labor supply and students with an opportunity to develop both soft and technical skills needed for the workforce - a win-win situation. While these best practices have worked for us, they may not work at every school or in every community. However, they can certainly be used as an example of one successful approach to cooperative education.



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Two Skills I Learned from Agricultural Education (and Two I Didn't)

by Tim Hammerich

I am an agribusiness recruiter. A normal part of my daily work is getting a list from employers of exactly what they want in their ideal employee. The jobs for which I recruit run the gamut within agribusiness. From fertilizer salesman to grain elevator operators, agricultural cooperative CFOs to Plant Electricians, I am often in search of role-specific qualities.

According to the National Association of Colleges and Employers (NACE), the top five attributes employers seek on candidates' resumes are leadership, ability to work on a team, written communication, problem solving, and verbal communication. These themes are generally consistent with the desires of agricultural employers with whom I work, but I would like to address the first attribute - leadership.

While most everyone desires leadership, hardly do they ever agree on the type of leadership they desire. An operations manager, for example, may want the type of leadership that will demand excellence, manage to efficiency, and lead from the front. A sales manager, though, may want more of a coach to develop a team of salesman. Further, a quality assurance manager may want the type of leadership that analyzes and develops new and industry-leading policies and procedures for a production process. Interestingly, all three of these hiring managers just call it "leadership".

Leadership is something agricultural education has prided itself on developing in young people for quite some time, but what kind of

leadership are we actually developing? This leads right into the two most important job skills that I gained from my agricultural education and FFA experiences as a student.

The Two Most Important Job Skills I Learned From Ag Ed

Collaboration. Collaboration has become a central theme in my life ever since I developed this skill in high school. From working as a class in the greenhouse, helping each other at the county fair, or creating a skit at an FFA conference, this was a part of every step of the agricultural education experience, but collaboration is a skill that must be developed through experience.

I often see talented candidates who cannot keep a job because they don't work well with others. I hear stories of candidates showing up for interviews and showing no interest in collaborating with their future bosses, co-workers, or subordinates. I am instructed from employers to find them a strong individual who is also a "team player".

I think this skill of collaboration is what they are getting at, and I am thankful that agricultural education instilled this skill in me early in life. Back in those days, I probably would have just referred to this as "leadership", and it certainly is one style or application for leadership, but I think it's a job skill in itself. As I watch younger people on their phones non-stop I wonder if this skill doesn't become increasingly rare in the future.

Verbal Communication Skills

"Tim, you're one articulate dude." Those were the parting words from

my one and only meeting with President George W. Bush in 2003. I introduced him at the National FFA State Presidents' Conference and had the chance to briefly meet with him after. I love this story for multiple reasons, but the point is that over six years in agricultural education, I had abundant opportunities to hone my verbal communication skills. I'm not just referring to public speaking, but also conversational skills, the ability to pitch ideas, providing feedback to others, and clearly explaining complex processes.

There are applications for these important skills throughout the workforce. Due to the speed of information and the competitiveness of business, it is vital for employees to be able to speak clearly and concisely. Also, we are learning in business what teachers have known for a long time: people like to be told a story. Storytelling is also becoming a business buzzword, where those who can most effectively tell a story in which the consumer is the hero and the company is the guide will find success. Often the best way to use storytelling is through the verbal communication skills.



Tim speaking with a group at the AGR/Sigma Alpha Leadership Seminars where he facilitated multiple professional development sessions.

Through FFA, I had the chance to get more verbal communication practice in high school than most get in a lifetime. While I attribute much of my career readiness to experiences provided through participation in agricultural education and FFA, there were some things I was not prepared for.

Two Skills I Wish I Had Learned From Ag Ed

“Wait, what? You didn’t learn everything you needed to know in life from Ag Ed?” I know, it’s been hard for me to come to terms with that fact as well. The truth is, the following two skills are just as, if not more important to agribusiness employers than the skills above, and these are two skills in which I was inept as I entered the workforce.

Project Management

If I’m being honest, I thought I would be great at project management. That was before I was in charge of a real project for the first time, when I realized that project management is a skill, separate from collaboration. While it is important to seek collaboration when managing a project, there is much more to it.

Project management involves initiating, planning, executing, monitoring, and closing the work of a team in completing some sort of final product. The skill requires extreme attention to detail, organization, proactivity, and follow through. One has to be okay with putting the mission (the project) above all else, including the above mentioned team, and above your own popularity.

I failed miserably at project management the first time I was in charge. This made me question: how did I not gain this skill from Ag Ed and FFA. My entire SAE was a PROJECT. That’s when the invisible safety net

of agriculture teachers and parents first became visible. The truth was they were driving the project, but letting me feel like I was sitting in the driver’s seat. If things started to get off track, it wasn’t me who brought the mission back into focus, it was them.

When it came to all of details required for bringing a project together, I counted on experienced FFA advisors. Granted, I was involved every step of the way, but the accountability was not all on me. As an agriculture teacher, are you also guilty of managing a project while telling your students it was their responsibility to plan and execute, all the while, though, you’re really making key decisions to ensure a successful product? You may not like it, and it may be uncomfortable, but to build project management skills, you have to let your students fail a little. Related to project management is another skill I didn’t develop in high school—problem solving.

Problem Solving

When was the last time you gave your students a problem that could not be solved by searching Google or YouTube? Problem solving is extremely important to employers. While there are standard operating procedures for most all aspects of the modern world of work, there will inevitably be times that employees will need to rely on their own thought processes to get them out of a situation.

Problem solving is a skill and it must be taught, nurtured and developed. We know that some career development events and leadership development events can help support problem solving, but only those students participating get the exposure and even then, the problems encountered in competitive events may lack in authenticity.

I felt a bit inadequate in this important skill area when I graduated high school in 2000. In the age of social media, many students think they can find all of the answers on the internet. While some can be found on the web, students will still need sound problem solving skills to survive and thrive in the business world.

Giving Employers What Employers Want

Agricultural education is a catalyst for preparing students for career success. That being said, here are some thoughts on how you can take your students’ preparedness to the next level:

1. Developing the ability to collaborate with others cannot be accomplished by simply putting students in a group and asking them to complete a task or have a conversation. When grouping students, each member of the group needs a unique role that is essential to successfully completing a task but also requires interacting with other people. Using peer evaluations that are factored into student scores and assist with individual accountability.



A pile of old technology sits at a school waiting to be discarded. This trash could become an ag teacher’s treasure when used by students to explore, play, think critically, and problem solve.

Continued on page 27

The Convergence of Agriculture, Technology, and Education

by Jacob Martinez, Jenni Veitch-Olson, and Yethzell Diaz

Fifty miles south of Silicon Valley is the Pajaro Valley, the strawberry capital of the world, and the home to a growing pool of talent in Watsonville, California. This talent is a young workforce with increased confidence and specialized skills for the technology industry, grounded in a deep understanding of their community. Silicon Valley dreams of courting this talent; however the agricultural industry of the Monterey Bay region also dreams of courting this talent to create new technological solutions for farming.

The future of farming depends on the development of innovative AgTech solutions, but the United States is not generating enough tech talent to fill the needs of the industry. Therefore, the industry must offer competitive salaries to entice recent graduates to work locally. Additionally, community stakeholders, including employers and secondary agriculture education teachers, must prepare young workers with the skills they need to address current agricultural industry needs and drive the direction of local AgTech industry in the future. As we continue to explore ways to build the future AgTech industry, an essential element for sustained workforce development is the inclusion of a local, tech-empowered workforce. Thus, in 2014, we launched the Digital NEST (Nurturing Entrepreneurial Skills with Technology) to build a

skilled and relevant workforce for our increasingly interconnected world.

The Digital NEST

The Digital NEST is a community-based education studio for youth, ages 12-24, that aims to help young people enter careers in tech and grow a stable, local workforce. Similar to communities and schools across the US, ours is an economically depressed city that faces staggeringly poor rates of health, increasingly limited and unaffordable housing, and growing involvement in street gangs. The Digital NEST serves disadvantaged youth, many of whom are Latino and immigrant. These youth are talented, with a deep understanding of their community but lack access to computers and Internet access. The NEST, as it's known, operates to end the economic stagnation that is endemic to many of our nation's rural communities by turning our California region into a tech hub that is uniquely equipped to address local issues, thereby strengthening our local economy.

Students who are at the NEST are "Members," and there is no fee or cost to use our tech tools or participate in our programs. Technology instruction occurs in both formal and informal learning environments, including free exploration, project-based learning, workshops, online learning, hands-on learning through working groups made up of peers, and individual coaching by our staff

and industry professional volunteers. Our programs consist of four career tracks, including an emerging AgTech pathway. We teach essential career skills such as project management, finance, marketing and communications. For example, NEST members learn how to manage client accounts, communicate according to industry standards, and create social media content. In addition to the technical training that will create tomorrow's tech-empowered workforce, youth develop these "soft skills" within the context of working on projects. One of our most recent projects focused on our local agriculture industry.

Identifying Local AgTech Needs

To determine skills youth needed for both current and future jobs in agriculture and create the AgTech Pathway within our program, we surveyed local farmers. This program will generate a skilled workforce for the agriculture industry by the agriculture industry. Solutions created within the industry are grounded in an understanding of the rich culture and long history of the agricultural industry, which is a valuable resource that is often neglected in the process of creating lasting technological solutions. Our process included listening to gain an understanding of the values and needs of the small grower in order to design and build a tool that is relevant to their needs. Local growers see potential in simple and useful AgTech tools that ease and streamline the documentation



Digital NEST Members designing the wireframe for the mobile Farm Book app.

and regulatory processes that constitute the daily work of running a farm. More stringent food safety regulations directly correlate with the increased demand for traceability and the zero-tolerance industry standards from grocers and consumers. Our industry experts all mentioned traceability as an area where technology has already changed their industry.

From listening to and observing the culture of farming, we learned that conversations about technology need to be framed in terms of immediate usefulness to the grower. Our research began with the following questions: how does farming operate, what tasks take the most time, and how could this process take less time? We reached out to five local experts, and all of our respondents predicted that the next generation of farm workers would have job-specific skills based on the changes that technology introduced to the industry. Through our interviews, we learned the importance of “meeting the need where it is”-- rather than lead with the tech-solutions, we listened to understand the need, reservations, and opportunities to begin to integrate tools that would streamline day-to-day processes, thus freeing up the most valuable resource of

all, time. An efficiency platform or tool is not chic, but it is simple and useful, which is a win with the farmers.

Developing a Simple, Useful Tool

“As a farmer, I do more paperwork than I’ve ever done in my life!” grumbled the brussel sprout grower, and this was a sentiment shared by all of our consultants. Documentation, regulation, and compliance issues arise and have to be dealt with every day by the grower. All of this required record-keeping is done on paper, and electronic documentation could significantly increase efficiency. Food safety regulations are tighter and are the most time-consuming compliance issue. With ever-changing laws regarding farm labor, human resources documentation is increasingly important as well.

Based on our conversations and assessment of small growers’ current needs, our team suggested shifting the documentation process from paper to electronic forms. Tools such as fillable PDF versions of the various reports would be a reasonable starting point for a more efficient workflow. Growers could use a simple electronic system that easily stores and accesses worker’s compensation forms, accident and incident investigation reports, and even personnel files. Subsequent solutions would include the development of online systems that allow for immediate submission of these forms to the appropriate agency and include live updates on submission status. Small growers we spoke to also expressed a need for time manage-

ment tools that accurately and easily track workers who shift tasks throughout the day.

After meeting with our small grower client in the field and gaining an understanding of the day-to-day workflow for said client, NEST members in the AgTech Pathway decided to focus their efforts on creating a simple tool that solved a daily problem for local farmers.

Launching Farm Book

This past fall, the Digital NEST offered our first AgTech workshop, which developed and designed a web-based toolkit that offered a simple electronic documentation solution for farmers. The online application, named “Farm Book,” is an electronic diary that includes a date and timestamp, weather conditions, and a camera feature to easily allow the user to document conditions in real-time as well as an electronic human resources form that captures the number of farm workers in a given area and time. NEST members participated in one of three development teams: the front-end web design team who produced the aesthetics of the app, the actual coding of the program was the responsibility of the back-end design team, and the operations and quality assurance team monitored the interactions with the client as well as facilitated the product launch event. The Farm Book team worked collaboratively as well as independently on the product; workshop sessions opened and closed with a group discussion of the goals and objectives. Each team created and implemented a discrete part of Farm Book, and

the success of the final product depended on the successful collaboration of the three teams.

The Farm Book prototype has the potential to scale into a business management platform solution. We pitched Farm Book to our local industry representatives and they immediately recognized the potential of the platform product. Furthermore, they expressed interest in possible beta testing of the product, should a future AgTech program develop it further. A beta test is a complete run of the program by a third party. These are typically the last trial of the software product prior to its market launch.

Incorporating AgTech in the Ag Ed Classroom

Farm Book launched to an audience of more than three hundred attendees of the Digital NEST Member Showcase Celebration in November. Both tech industry insiders as well as not-techie NEST supporters navigated the product that our members developed and designed. We share this as a piece of encouragement – you can prepare your students for the AgTech workforce without being a techie yourself! In this piece, we share a variety of skills that could be taught and practiced in an agriculture education course that would not only prepare students to study AgTech in a postsecondary setting, but also equip them with the problem solving skills essential for innovation in the industry. An integral part of the future of agriculture education is the incorporation of AgTech workforce development. With this in mind, here is

a primer on how to assimilate AgTech training into your program:

- Conduct a knowledge and career skills needs assessment with local and regional employers and postsecondary education providers aligned with your program(s) of study. In addition to understanding which advanced careers are available in the industry, learn about what entry-level positions look like and map the course's skill development goals to this description.

- Identify opportunities to introduce students to knowledge and skills needed for participation in related postsecondary endeavors through classroom and laboratory instruction.

- Have students interview community members to identify problems that could be solved through student projects. Engaging local stakeholders in this way provides an opportunity to incorporate “real world” experiences in the classroom.

- Design project based learning opportunities that require students to interact with industry consultants for feedback throughout the project period.

- Create collaborative learning opportunities that are centered on giving learners autonomy and room for self-expression and exploration. Provide enough guidance for students to feel safe and supported while also giving them space to shape, plan and implement the project based on their ideas. Also, offer students the option to work in teams and individually, such that the success of the

final product relies on the success of each individual and targeted group efforts.

By incorporating technology and learner-driven, project-based learning into your agriculture education program, your students will become the local talent that your agriculture industry needs. Through learning experiences like these, your students will develop a portfolio of experiences to inform their decisions about postsecondary education and career opportunities. The Digital NEST is at the forefront of equipping the next generation of AgTech industry leaders, and, as an agriculture educator, you could be, too.



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The Agricultural Education Magazine

Investing in School-based Agriculture Education - A Workforce Solution

by Russ Plaschka, Kerry Wefald, and Dana Ladner

Agriculture is an industry of variables and unknowns – the weather, operation size and ownership structure, markets and the economy, plant disease, land price, global consumer perception - the list goes on and on. One thing, however, is known: Kansas is making progress in developing creative approaches to bridging public and private resources for the benefit of agriculture education classrooms.

It is no surprise that agriculture is big business in Kansas. The sector's economic contribution to Kansas is 43% of the total gross regional product. Agriculture, food and food processing supports 12% of the entire workforce in the state. Investing in agriculture education is a proven way to build a solid foundation that supports the agency's mission of creating a "best-in-state plus" workforce and work environments with a positive culture and attitude. Our progress is the result of surveying the workforce, focusing on student supervised agricultural experiences (SAE), and developing an agriculture industry certificate program for agricultural education students in Kansas.

Workforce Survey

The number is 19 - that's right - 19. According to the Department of Labor (DOL) 19 is the number of occupations classified in agriculture, which is not exactly the 235 identified on the National FFA Organization's website. An example of missing DOL, consideration would be our states market share of agriculture equipment manufacturers. Kansas is home to many companies such

as Landoll Corporation, Sunflower Manufacturing, Great Plains Manufacturing and Hesston Corporation. The DOL classifies these companies as manufacturers and agriculture companies, thus creating a divide between sectors.

In response to the DOL's limited scope and definition of agriculture careers, Jackie McClaskey, Kansas Secretary of Agriculture, authorized the first Kansas Department of Agriculture (KDA) Workforce Needs Assessment Survey. During winter 2015, more than 250 responses were received from farmers, ranchers and agribusinesses collectively employing more than 12,000 Kansas residents. Survey results indicated 44% of respondents were willing to expand their operations to capture new markets or expand market share. One of the limiting factors noted was the lack of an available and skilled workforce. More than 66% of respondents were willing to work with local education providers, and 60% wanted to offer internships or job shadowing opportunities on the secondary and postsecondary level.

The top five soft skills lacking in employees noted by respondents were: motivation, time management, dependability, communication, and leadership. The "hard or occupational" skills lacking in employees were: critical/analytical thinking, basic communication/writing, and maintenance/machine operation. As follow-up to the KDA survey, a nationwide survey of higher education faculty, who are members of the North American Colleges and Teachers of Agriculture (NACTA), was conducted by Dana Ladner, compliance education coordinator for KDA. Results indicated:

- experiential learning opportunities, like internships and SAEs, are viewed as a valuable tool for student success;
- many partners are needed for a meaningful experiences, including interested students, faculty members, administrators, career counselors and industry allies;
- learning experiences should be structured with goals, objectives, and hard and soft skills assessed and evaluated.

Further, the 2015 Job Outlook provided by the National Association of Colleges and Employers (NACE), indicated 70% of employers prefer to hire college graduates with relevant work experience and 60% of those employers prefer the work to be gained through an internship. But, why wait until college when that can begin in high school? Armed with data, KDA recognized the benefits of student SAE programs as a vehicle for reinforcing knowledge and skills needed in the agricultural industry.

Focus on SAE

Kansas Secretary of Agriculture McClaskey has made it a priority to promote and encourage total SAE participation within agriculture education classrooms. "SAEs are a valuable tool that teach young adults not only technical, transferrable skills but also the soft skills needed to be successful in the workplace," says McClaskey.

Because comprehensive SAE programs assist in preparing students with continuing their formal education or transitioning directly into the workforce, they are essential to

the Kansas agriculture workforce development. As described by McClaskey, the KDA agriculture workforce initiative is a three-pronged approach involving the industry and school-based agriculture education. This involves ensuring teachers are confident in teaching and supporting the entire program with total SAE participation (prong 1), a Career and Technical Education (CTE) bill introduced in 2012 (prong 2), and an agency pillar to develop the 'best-in-state plus' workforce and work environment (prong 3), which communicates the expectation that employees engaged within Kansas agriculture are competent, committed, and dedicated to total support of the industry. This approach is woven into agricultural education through CTE programs.

The goal of Kansas CTE is to provide students with relevant contexts for learning through pathways to prepare for college and a career. The agriculture workforce development vision recognizes the importance of SAE, agriculture skills and competencies certificates, and purposeful job placement inside the Kansas agriculture industry. To honor students' dedication to coursework, SAE, career development event participation, proficiency applications, leadership development, State FFA Degree achievement and comprehensive exam successes, we created the Kansas Agriculture Skills and Competencies Certificate program.

Kansas Agriculture Skills and Competencies Certificate Program

The Kansas Agriculture Skills and Competencies Certificate Program awards certificates to eligible agriculture education students, giving them an employment advantage upon graduation from high school. The certificate documents skills and

competencies gained by student participation in agriculture education, representing an opportunity to quantify and qualify the impact of an agricultural education program.

In order to be eligible for the Kansas Agriculture Skills and Competencies Certificate the following requirements must be met:

- Complete three high school agriculture education credits.
- Been an FFA member for at least two years.
- Complete either an FFA Proficiency award application deemed acceptable at district level, according to the placement proficiency award evaluation, or earned the State FFA Degree.
- Obtain a cumulative GPA of 2.5 or higher in all classes, not just agriculture education.
- Participate in one leadership event or Career Development Event (CDE) and one technical CDE.
- Satisfactorily complete the Comprehensive Agriculture Assessment.
- Identify at least five skills and competencies gained through participation in an agricultural education program.

Certificates are available in three areas - general agriculture, animal science, and plant systems – and schools receive \$1,000 for each student who earns a certification. KDA sponsors the certificate program for Kansas FFA members, which has been endorsed by the Office of the Governor, the Department of Labor and the Kansas agriculture community, including the Kansas FFA Association, Kansas Farm Bureau, Kansas

Grain & Feed Association, Kansas Livestock Association and others.

Moving Forward

As the Kansas agriculture workforce development initiative continued, funding of a full-time staff position housed in the Division of Agriculture Advocacy, Marketing and Outreach was key. "Our division is tasked with not only supporting agriculture education classrooms but also facilitating business and industry growth and expansion," said Kerry Wefald, director of the division. "We know that hiring entry-level employees and also recruiting mid-level talent can be challenging for our industry leaders. Many times potential employment networks and resources may be in place; however, business and industry leaders may not have the right connections or relationships."

KDA continuously seeks input from farmers, ranchers and agribusinesses that have a vested interest in keeping the Kansas agriculture sector healthy. Public-private partnerships with agribusinesses in the state are essential for the successful growth of the agriculture industry. The Kansas Department of Agriculture serves as the bridge that links business and industry with educators and students with the hopes of developing true partnerships. These partnerships are the focus of the workforce development position at the KDA. We are working with our teachers, encouraging them as well as farmers, ranchers and agribusinesses to come together for more than just fundraising. When industry shares equipment, technology, and expertise the agriculture education program receives invaluable resources and experiences for their students. Industry needs to benefit as well and we see this through access to the program's most valuable resource,

the students. When industry can come into our classrooms and recruit students early in their high school career it is a win/win - students can see what opportunities await them soon after graduation in their home community and industry has access to a pipeline of skilled workers. When we truly step back and look at what the primary focus of our agriculture education student experiences should be, isn't it that each of our students have the opportunity to be fully prepared to work in the agriculture industry?

As teachers of agriculture, you can play a pivotal role in creating similar public-private programs in your communities and state. It begins with engaging the agriculture industry, accepting honest feedback

and making a plan to address current and future needs. Fully understanding the situation and assessing need provides a strong portfolio of information to share with your state department of agriculture, state and local level workforce development contacts, or other elected leaders in positions of influence.



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Two Skills I Learned... (continued from page 21)

2. While the number of students that can compete in an FFA event are limited, hold a classroom level competition as part of your regular curriculum and require student to participate. The training for those who represent the chapter may be a bit more intense, but this approach ensures students are not missing out on these important opportunities.

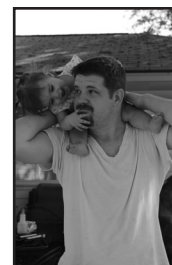
3. When student projects come together in the end because of adult intervention, the most powerful lesson is not learned. Let your students take full control of your chapter awards banquet or some other activity and let them experience the true accountability of managing a project to completion. While the quality of the event might suffer, the quality of the stu-

dent experience and the lessons learned will be greatly enriched.

4. Problem solving skills can be taught by introducing students to case studies that require them to apply knowledge concepts to a practical scenario. Or, create your own problems by reaching out to members of the community and asking for agricultural challenges. Perhaps a family has a rodent problem, a gardener is struggling with a specific crop, or someone has a lawnmower that no longer runs – these are real-life problems your students could solve that would require practical investigation and thought.

Developing all of these skills requires elevating the rigor of classroom instruction, demanding high

quality work and allowing students to struggle. If they are not used to it, this may not be appreciated in the short term by your students, but I promise they will thank you later. My agribusiness clients will also thank you.



Tim Hammerich, with daughter Faith.
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Back Cover: Photo courtesy of Jacob Martinez: Digital NEST Member in the field taking notes about the needs of farmers.

