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Potpourri Issue: Something for Everyone

Something for Everyone

by John C. Ewing

Over the past weeks, I have done a lot of thinking about how quickly each year passes. I hope that each of us have reflected on the past year, and the many aspects of your teaching that have gone well, and maybe some areas that are still in need of improvement. For the areas that have gone well, I encourage you to keep up the good work, and look for ways to make those teaching and learning experiences even better. For the areas that you did not go as well as you had hoped, look for ideas to improve. I am hopeful that some of these ideas may come from the Agricultural Education Magazine; perhaps this very issue. Over the past few issues individuals have contributed articles that provided a wealth of information on improving communications for your program, becoming a better educator through professional development, properly implementing advisory committees, remembering our history as an education profession, and much more. These focused areas provide you, our readers, the opportunity to reflect on a specific area of your own teaching and programming. I hope that you have taken the time to examine the articles and choose items from each that will help make you a better educator.

In the same vein of becoming a better educator, the articles in this issue are just as timely as our other theme issues. However, for

this first issue of 2018 the theme editor, Eric Rubenstein and I, accepted articles from all areas of agricultural education. We have chosen to do this once again, as we believe that it allows articles from many areas of agricultural education to be shared, whether they fit one of the past themes or not. The January/February 2018 issue of the Agricultural Education Magazine opens the doors to many topics that may not “fit” nicely into one of our past, or upcoming, issues. After reading the articles that were submitted for this issue, I am glad that this issue was offered again. Each article provides information that can make us better teachers, which in turn helps our program and most importantly our students.

Articles in the issue explore agriculture teacher recruitment, service learning, content literacy and agricultural literacy, inquiry-based learning, team-based learning, and much more! Each of these articles provide a unique perspective on the topic presented. Take time to read each article and think through how the content applies to you and your program. Be thinking of questions like; “How can this make me a better teacher?”, “How will this help my students?”, or “How can I implement this in my program and/or community?” There are many best practices shared throughout the magazine, and I know that many of these ideas will improve our programs. I encourage all of us to be using the

information shared on these pages to improve agricultural education across the nation!

You may notice a new addition to this issue of the magazine; a book review. We have decided to include a book review in this issue that may be of interest for your professional reading. This particular review reminds us, as very busy agricultural educators that sometimes we need to say “no”. Knowing when to do so can sometimes be difficult, but this book may help provide strategies in how to approach this decision making process. Let me know your thoughts on the addition of a book review to our magazine. If you, as our readers, like the book review page, I along with our theme editors, will request such reviews for future issues. You can send feedback to me at jce122@psu.edu Thank you and happy reading!



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Article Submission

Articles and photographs should be submitted to the Editor or Theme Editor. Items to be considered for publication should be submitted at least 90 days prior to the publication date of the intended issue. All submissions will be acknowledged by the Theme Editor and/or the Editor. No items are returned unless accompanied by a written request. Articles should be approximately four double spaced pages in length (1500 words). Information about the author(s) should be included at the end of the article. Photos and/or drawings appropriate for the “theme issue” are welcomed. Photos/drawings should be submitted in an electronic format (jpg or tiff format preferred – minimum 300 dpi). Do not imbed photos/drawings in the Word document. A recent photograph (jpg or tiff format preferred– minimum 300 dpi) of all authors should accompany the article unless photographs are on file with the Editor. Articles in the *Magazine* may be reproduced without permission but should be acknowledged.

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Agricultural Education: A Place for Everyone

by Eric D. Rubenstein

As I sit at my desk beginning a new year, I have continued to think about all of the change and innovation that has occurred in Agricultural Education since the passing of the 1917 Smith-Hughes Act. In the 101st year since the passing of Smith-Hughes Act, I believe that we are following a path that will

allow for each of us to develop new ideas and programs that will increase outreach and impact on students across the United States of America. As we look to the future, I encourage each of us to think about how we continue to adapt our teaching strategies to meet the needs of our students.

how many of our students find a safe haven in our programs. Many days we, as teachers, forget about the struggles that our students face every moment of their lives outside of our four walls. My hope is that every student in public education can find a place where they feel safe and able to be themselves. My challenge for every agriculture teacher and teacher educator is to provide that place for at least one student. I personally can at-

Our current students, have grown up in an environment where the answer is always at their fingertips (a cell phone or computer). I know that many teachers I talk to worry about how to keep students engaged and learning without becoming an entertainer rather than a teacher. While, this could be a true fear for many teachers across the United States ... I believe that the articles included in this issue of the Agricultural Education Magazine give us many examples of how we can continue to promote learning and education in a way that will connect with our students.

I hope that you all have a wonderful school year!



test that these interactions will be the most memorable experiences we can have as teachers. To provide this environment to students, we must continue to strive to use more student centered teaching approaches and move away from teacher centered instructional techniques. While this is sometimes challenging to give up some control of your classroom, student engagement and content acquisition will skyrocket!

As I travel to different agriculture programs across the state of Georgia, I am always reminded

test that these interactions will be the most memorable experiences we can have as teachers. To provide this environment to students, we must continue to strive to use more student centered teaching approaches and move away from teacher centered instructional techniques. While this is sometimes challenging to give up some control of your classroom, student engagement and content acquisition will skyrocket!



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Where are all the Ag Teachers?

by Kris Beaver

In everyone's life there are moments of great clarity. I had one of those moments when I was asked to do a panel for a Teach Ag workshop at our state FFA convention. One of the statistics presented demonstrated the shortage of qualified and trained Ag teachers. I knew in Wisconsin we had a large number of teachers that were in their first seven to ten years of teaching and a large group of teachers with twenty or more years of teaching. The epiphany was that we needed to do something for the teachers in between those two groups. It was at that moment that I was determined to do whatever I could do to help the profession that I love.

It was that moment that led to the creation of a coaching/mentoring program called Teach Ag Thrives. In Wisconsin we are using our STAR Teach Ag dollars to invest in the Ag teachers that are most likely to leave the profession for one reason or another. Across the nation 47 of the 50 state Ag teaching associations have a program for teachers in years one through three, but only three of fifty have a program that is aimed at teachers years five through fifteen. I saw this as an incredible opportunity to make a difference in people's lives.

I researched what other states and NAAE are doing for that experience level. It became obvious that years five through fifteen are "forgotten years" in the profession. Yet, this is the time when the stress and workload for teachers ramps up to levels they are not always ready to deal with. This is the time in a teacher's life that it is common to get married, buy a house, have children and take on leadership roles in their school or state association. It became obvious that Ag teachers in the five to fifteen year experience range need a level of

support that is not always there for them.

Teach Ag Thrives took a huge jump forward when I was introduced to Natasha Mortenson from Minnesota. Natasha had been working on an idea to help teachers deal with the stress and workload issues that so many of us deal with. She was also kind enough to tell me the things that did not work in her first attempts. Her biggest learning point was that the support needed to be long term. A workshop at a professional development conference or a newsletter would not be enough. The support needed to be throughout the school year. I decided that any program that we put together needed to start in September and go through May. Nine months of support to help teachers struggling to stay in the profession that is theirs by choice and not by chance.

Natasha also introduced me to Mark Jewell Speaking and Training and Amanda Sollman Chief Operating Officer of Mark Jewell Speaking and Training. Through much discussion Amanda and I developed a program that has two unwavering philosophies. One, the program must be long term. Two, there needs to be a level of anonymity. Teachers have to be comfortable entering the program and knowing that their participation is known only to those that they are comfortable telling. It is for that reason that I do not know who the participants in our program are.

Here is how it works. I introduced the program at our PDC in the summer of 2017. If a teacher was to participate they had two routes. They could apply themselves or they could be nominated by a fellow teacher that thought they could benefit from the coaching/mentoring. After being nominated they still needed to fill out the application so that we knew they were serious. After all, we were in-

vesting sponsor dollars in them. We wanted committed individuals to be a part of the program. After filling out the application and being accepted there was an introduction meeting via phone. All applications were screened and the participants were selected by Amanda. The introductory meeting was in August of 2017. Each participant meets with Amanda for one hour per month September through May. The time can be all at one time or split into two thirty minute sessions.

We are three months into the first year and results have been great. We have had some great learning moments. One, the anonymity has been the key to the success so far. Two, all of the teachers participating are facing the same issues. Nothing bore this out more than the fact that, in one form or another, each person said, "I thought I was the only one that had that problem."

The vision of the program is to have current year participants work as mentors for participants in future years and share their experiences with those teachers. We will have teachers from Wisconsin talk to teachers from Minnesota who have gone through a similar program. This extends the anonymity to a certain extent. We believe it will be much easier to talk to someone that will not be at the same conferences and professional development.

Teach Ag Thrives is a great program. We will change and refine it as needed, but in the end we will have Ag teaching professionals that have the tools and knowledge to meet the ever increasing challenges that they face professionally.



Kris Beaver is the Agriculture Teacher at Waupun Junior/Senior High School.

Living to Serve

by Greg Schneider

We are agriculture teachers by choice and not by chance. We reaffirm this statement every day as we continually look for innovative ways to engage our students - both inside and outside of the classroom. I've been teaching 26 years. In that time, I have tried to make sure it was never the same year twice. In the interest of full disclosure, I cannot say I have always been successful. When the work-life pendulum swings, you sometimes just have no choice but to follow the momentum. The birth of a child, restoring a house, acquiring a neglected farm...all life events that place demands on time outside of the school day.

And so, as professionals, we are continually seeking that elusive, harmonious balance between work and family. How can we provide for our school and community, while trying our best to keep these efforts confined to a 10 hour day? Project-based instruction has always been a focal point of many of my classes, but after 22 years of teaching, I stumbled on to a strategy that most of the time helps, and only occasionally hinders. That teaching strategy is (cue drum roll)... service learning.

Some 20 years ago, I was at one of my first Agriculture Teacher in-service trainings as an aspiring young teacher. An older, experienced teacher was speaking on what makes a successful agriculture program and FFA chapter. I distinctly remember him saying, "It doesn't matter how many trophies your FFA chapter wins or how many plaques you have hanging on your classroom wall; if you want

your community to truly support your program, figure out how your program can support your community."

Over the years, I have never forgotten that sage advice and I have taken it to heart as I develop hands-on learning experiences in each class I teach. I search for ways to combine my curricular standards and course objectives with opportunities for my students to engage in meaningful service learning activities that will also meet community needs.

Greensburg Community High School is a "city school". While the City of Greensburg is surrounded by a strong and progressive agricultural community, 90% of my students come from a non-agricultural background. We are on an alternating block schedule. As such, I teach on a 90 minute class period. Our geographically central location in the city and county puts us within 10 minutes of most potential projects. The extended class period gives us ample time to travel to off-campus locations. Service Learning opportunities abound and connections can be made to just about any agriculture course.

Landscape students hone their maintenance and installation skills by helping out at our county park system. Students maintain plant beds, prune trees and perform other various tasks as needed. We also perform landscape work around our courthouse and the town square. Landscape students wear Hi-Vis vests for safety reasons, but it also makes us more visible in the community - we receive a lot of positive feedback from people that see the difference students are making. And, of course, there is nothing like having your students seen working outside around

the school campus on a beautiful spring afternoon to serve a recruitment tool for the agriculture program.

Natural Resource Management students maintain public use hiking trails and also work to help manage the 17-acre lake and the native and non-native waterfowl populations at one of our county parks. Students perform a valuable services by enabling the paid Parks & Recreation staff to focus attention where needed. We also partner with our State Department of Natural Resources in performing Best Management Practices at a state managed Wildlife Area that is close to the school. Students work alongside industry professionals while learning new skills and exploring career opportunities. By engaging with outside partners, students have opportunities and firsthand experiences I would never be able to provide on my own in the classroom.

Horticulture students visit local assisted living centers to take care of plants and engage with the elderly residents. While students are learning about plant care, they are also learning professional skills and developing an appreciation for cross-generational knowledge. Horticulture students also maintain our school garden. Vegetables are raised for student use in our FACS classes. The summer harvest goes to local food pantries. We are currently looking at ways to expand our vegetable production to include produce raised for our school cafeteria salad bar as part of a Farm-to-School initiative.

AgriBusiness students created a marketing strategy to help promote local agriculture and increase the agricultural literacy of community

members, the vast majority of which come from a non-farm background. By creating a more “Ag Friendly” community, we hope to attract more agriculture industry to our area and thus strengthen our local economy. We are currently in the process of finalizing plans to build a school farm on our campus. AgriBusiness students also took the lead in researching and creating business plans for various farm enterprises that we can implement on the school farm to make the operation economically sustainable. All proposals had to meet the following criteria: generate income, engage at least one agriculture class in the learning process and promote local agriculture. Business plans were presented in a Shark Tank fashion to school corporation administrators, school board members and local agribusiness people.

Animal Science students play a huge role in addressing local food insecurity through our “Community Livestock Projects”. In a partnership with a neighboring agriculture program, students raise dairy beef steers on a local farm close to school. On the same farm we also raise groups of six hogs. Young animals are donated to the project by local farmers. Two local feed mills provide feed and the students provide the labor. The animals reach market size, they are taken to a processor. The cost of processing is covered by another state organization. Students are learning how to raise livestock and understand how food is produced, the community has a reliable source of meat protein for food pantries and agriculture is placed at the forefront as a sustainable solution to local food insecurity. It is an amazing example of the synergy among our agricultural community, agriculture students included.

In order to provide students with the flexibility to align their own per-

sonal passions with a community need, we created Capstone Service. Juniors and Seniors customize their own individual service projects. Students learn to identify and engage with community partners, locate and leverage resources and successfully implement a plan of action. Students enroll in this course as an independent study, but also have the opportunity to collaborate with their peers as they work through identified challenges.

Resources for implementing service learning are available through the National FFA Organization’s Living to Serve program (<https://www.ffa.org/livingtoserve>). Online resources and a dedicated and friendly staff are available to provide anything from the logistics of how to plan an event and set SMART goals to an ever growing portfolio of ideas to grant funding to help make it all possible. Each state has a network of Ag Ed consultants and specialists that can assist in this endeavor as well. However, your greatest allies will be found at the local level. Reach out! You will find partners in areas you never expected. And once your agriculture program builds momentum and a reputation of service, you will find securing partnerships and funding becomes even more fluid.

Service learning can be a valued educational component of the courses offered through any Agriculture Education Department. By integrating these activities into the existing course learning objectives, everyone wins. The community has important needs met; you have meaningful activities that strengthen the agriculture program by improving positive interactions with the community; your family wins because most of these activities take place during the instructional day; and the students have learning experiences that make

a positive difference in their community and experiences that will influence them for the rest of their lives.. By allowing students an opportunity to invest themselves personally in the learning process, they take pride and ownership in their community, which lays the groundwork for students to become active and invested community members as adults.

There is an ancient Chinese proverb, “Tell me and I will forget. Show me and I may remember. Involve me and I will understand” Service Learning opportunities do not come in a neat, three ring binder. They are often dirty and messy. They are sometimes covered in tears and disappointment, but there is also ample quantities of pride, joy and immense satisfaction. All of these emotions – good and bad - are hallmarks of personal investment. When students invest themselves personally, they are active learners. They are engaged and they are thinking. They are developing skills that they will remember and use for the rest of their lives.

While it does require more effort, from my perspective as an agriculture teacher, these examples are the true merits of service learning. Good trade.



Greg Schneider is the AgriScience Teacher/FFA Advisor at Greensburg Community Schools and is a National FFA Teacher Ambassador and a National AgriScience Teacher Ambassador.

*They Said What?**The Crossroads of Content Literacy and Agricultural Literacy*

by Chris Clemons and Jimmy Lindner

The concepts of being agriculturally literate (understanding) and possessing agricultural literacy (application of concepts, theories, and principles) are often misunderstood. Being literate in a content area (in our case agriculture) requires technical knowledge consisting of reading and writing skills needed to digest and make sense of relevant information presented. Literacy, however, is the ability to use reading and writing to learn about agriculture. Both are needed to accelerate learning in the classroom and to enable autonomous learning beyond the classroom. Agriculturalists campaign the importance of being agriculturally literate, however, defining literacy proves to be elusive and difficult (McKenna & Robinson, 2014).

According to Mercier (2015) the U.S. population is not agriculturally literate: dramatic increases within global populations, urbanization of populations, and aging farmers exacerbates the agricultural literacy problem. The global population will surpass 9.8 billion by 2050 (UN DESA, 2017) with a shrinking percentage of individuals involved in large scale food production, agriscience, or post-secondary agriscience pathways. This presents our profession a clarion call to communicate better with a population not familiar with “agricultural” terms, phrases, and vernacular.

Agriculture classrooms offer an abundant amount of content (agriculture) literacy to help our students complete tasks, operate within the field of study, and converse at a level shared between the teacher and stu-

dent. Recently while observing a secondary agriculture classroom, students were learning the pathway of seed germination to becoming a mature plant. Numerous content specific terms were introduced to support the objectives being taught. Specialized terms such as scarify, imbibe, endosperm, seed coat and many oth-

that agriculture teachers had higher knowledge scores in content literacy and more positive attitudes than other secondary teachers.

The modern definition of agriculture conveys the breadth and scope of the agriculture industry, while not overwhelming the reader. Merriam-

This article explores this type of interaction in our classrooms and the role agriculture educators have in developing agricultural literacy for future agriculturalists.

ers supported the instruction and the measure of student learning. During the lesson students were instructed to place the correct term on a seed diagram, which indicated their understanding of the vocabulary as a means of formative assessment. While most students correctly corresponded the term with the appropriate placement on the diagram, many students were unable to describe and apply the function of the term as a component of the germination process. Knowing this level of disconnect exists, we must ask ourselves “does understanding content literacy promote agricultural literacy?”

This article explores this type of interaction in our classrooms and the role agriculture educators have in developing agricultural literacy for future agriculturalists. Harris and Birkenholz (1996) found that secondary school teachers were knowledgeable about and displayed positive attitudes toward agriculture. This finding reinforces the conclusion that agriculture educators securely hold content literacy, while agricultural literacy is missing from teacher-educator curriculum. They noted

Webster (2017) defines agriculture as: “the science, art, or practice of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products.” While this definition is accurate, it fails to convey or assume the reader has a contextual background in the field of agriculture or a degree of literacy. An individual’s ability to decode descriptive, technical, or satirical text does not ensure literacy skills within a given academic area.

In order to understand the differences between agriculture teachers and student knowledge in agriculture an examination of the terms “literate” and “literacy” is appropriate in relation to agriscience education. Merriam-Webster (2017) defines the terms literate as “able to read and write,” and literacy “knowledge that relates to a specific subject.” Agriscience textbooks, articles, student writings, and exams require the application of reading and writing, yet, at what extent are assumptions made that each student truly demonstrates literacy? Agriculture education is a shining example of the instruction of theory

through application and review of concepts as we prepare students for post-secondary education or career opportunities. Students should demonstrate functional and workplace literacy. Functional literacy is the ability to read and write sufficiently to function in a society, e.g., by reading the newspaper, usually written at about eighth grade level. Workplace literacy is a higher level of literacy needed to earn a living, e.g., by reading technical manuals, often written at a post-secondary level.

Workplace literacy becomes disciplinary literacy applied to the disciplines studied in school, and the ability to use reading and writing to learn in a discipline. This suggests that agricultural literacy, as a type of disciplinary literacy, is the ability to use reading and writing to learn about agriculture, both as a means to accelerate learning in the classroom and to enable autonomous learning beyond the classroom. Agricultural literacy, like any disciplinary literacy, requires specialized reading and writing skills that may not be available in other disciplines. For example, a schematic diagram would likely baffle a scholar with deep literacy in the discipline of English literature, while analyzing Shakespeare could potentially have the same effect for agriculturalists. The true measure of literacy, however, is the ability to read and communicate the nuances and facts outside of our expert field. To test this assumption, reflect on the following scenario. During an agriculture mechanics course, you are describing and demonstrating the function of the carburetor as a means for air/fuel delivery into the engine for the production of power. Various terms are used to describe the processes all of which are new to your students: venturi, bowl, main jet, choke, throttle, linkages, etc. During instruction you demonstrate the

function of each term, the correct application of the terms in the process of carburation, and the function of each individual component and its role in the overall system. As your lesson progresses, you are checking for understanding, asking probing and open-ended questions, and asking for a demonstration of the terms in relation to the physical attributes of the carburetor. Does this scenario describe the instructional style used for small engines? Most teachers would agree this example provides a fairly accurate description. Assuming your students have acquired content literacy, how can we extend this learning into agricultural literacy? How would students write and communicate with students who didn't receive your instruction? Would students rely on content specific terms to describe the functions to individuals with no background or training? Agriculturalists are the front line of explaining the industry, science, and social aspects of agriculture in language clear enough to counter the ubiquitous misconceptions prevalent in the public mind. When agriculturalists struggle to define literacy, and yield to established forms of technical language of animal, plant, and mechanical sciences, we may be forfeiting a key bridge with the general public.

As we approach the end of the fall semester and can see the spring term on the horizon we reflect on our approach to extending agricultural literacy beyond our classrooms through engaged student writing and communication...and INVITE you to do the same. Teachers and students demonstrate tremendous specialized literacy with each other; just think about acronyms and language involved in FFA. This is a learned language that is reinforced through instruction, application, writing and communication. What would the results be if we engaged our communities in this level of agricultural literacy?

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Using Agricultural Stereotypes in the Media to Prepare Students for Careers in Agriculture

by Lori Costello

When it comes to stereotypes about agriculture, look no farther than the 55-inch Smart TV in your own living room. Entertainment media depicts dozens of portrayals of what the American farm and farmer “looks” like. As those who have lived on a farm or have worked in industries supporting agriculture can attest, many of these depictions are inaccurate or flat-out false. Farms today don’t resemble the idyllic red barn nestled in rolling hills with grazing dairy cattle, and most farmers don’t look like Old McDonald.

In a 2015 blog post, Overbay said it is up to people working in agriculture to “dispel myths about the stereotypical farmer by establishing a solid, recognizable level of professionalism in everything we do,” (para. 12). I believe wholeheartedly in this sentiment, and suggest agricultural educators lead the charge by helping students not only understand the existence of agricultural stereotypes, but also ensuring students are armed with the right knowledge and skills to combat such stereotypes when they enter the agricultural workforce.



In the fall of 2016, I taught the course Experience Agriculture – Study Away. As an upper-level course open to students in the College of Agriculture and Life Sciences at Texas A&M University, the course was designed to foster critical thinking, reflection, and interaction with peers within the context of modern agriculture. The curriculum I developed for the course included analyzing agricultural stereotypes in various media including documentaries about agriculture, reality television, country music, cartoons, advertising, and social media. The course also included a 10-day field trip to the National FFA Convention in Indianapolis, Indiana. While attending the National FFA Convention, students volunteered to assist with the Career Development

However, before students could combat stereotypes, they needed to understand how stereotypes are formed and reinforced. This was the most difficult part of preparing my curriculum. It was important that my own opinions and biases didn’t creep into the work we were doing. My goal was not to tell my students what they should think, but to present materials for them to consider and assess with a critical eye so that they might come to their own conclusions about whether or not the media reinforced stereotypes about agriculture.

Course Curriculum

To prepare my curriculum, I spent weeks gathering materials, such as broadcast media, printed media, and

The curriculum I developed for the course included analyzing agricultural stereotypes in various media including documentaries about agriculture, reality television, country music, cartoons, advertising, and social media.

Events (CDE). To create synergy between the course curriculum and the field trip, the locations visited during the field trip were featured in the media students analyzed. Field trip locations included Duck Commander, Wal-Mart, Tyson Foods, and The Grand Ole Opry, just to name a few.

Experience Agriculture – Study Away provided me with an opportunity to prepare my students to combat agricultural stereotypes in their future careers.

agricultural media effects literature (Ruth, Lundy, & Park, 2005; Holt & Cartmell, 2013; Specht & Beam, 2015). The documentary Food Inc. (Kenner & Pearlstein, 2008) was the first media example used in class. The documentary drove a lot of the discussion, as well as my choices for the field trip experiences. The documentary was easily accessible to students on Netflix, Amazon Prime video, and other popular sources for streaming media. Students also viewed the short documentary film Meet Your Meat, which was available on PETA’s website and on YouTube.

The course was predominately discussion-based, and students were

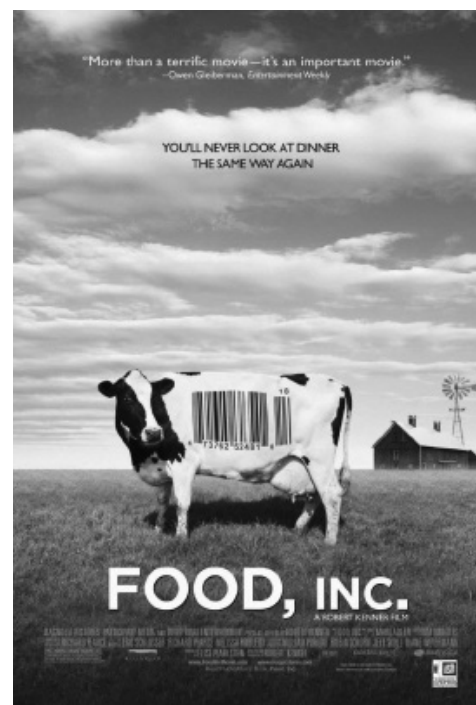
required to keep a reflection journal to expand on class discussion and field trip experiences. This format was embraced by some students and loathed by others. Even though some students were unaccustomed to a course that required a vast amount of dialogue, I continued to encourage them to share their thoughts and opinions. It didn't take long for some students who initially felt uncomfortable sharing to begin talking openly. I set up a course Facebook group where I would post additional media examples that either supported or refuted what was presented in class. Soon students were finding examples of agricultural stereotypes in the media on their own and posting them on the class Facebook page, which initiated continued dialogue outside of the classroom and provided me with an unanticipated learning assessment tool.

Classroom Cliques

As the semester went on, I was both excited and discouraged by the students' progress. On one hand, students were not only participating in class discussions, but they were also reflecting in their journals and engaging in dialogue via social media. That was exciting because it demonstrated students were thinking about course constructs outside of class. On the other hand, interpersonal issues began creating difficulties in class, which discouraged me. Cliques were forming, and I started to see referenc-



es to the segregation in the classroom in the students' reflection journals. A student described the classroom segregation this way: "...we have the Ag kids, the Corp [of Cadets] boys, the sorority girls, the school nerds, and everybody else." I realized that even though the students were learning how to evaluate agricultural stereotypes in the media, they were not overcoming the stereotypes and judgments they had of each other based on attire, collegiate organization membership, PanHellenic affiliation, academic major, or geographical background, as well as other traditional stereotyping characteristics (e.g., race, religion, gender, age). I started to dread the 10-day



Students who are considering joining the agricultural workforce will be tasked with combatting negative perceptions about agriculture and rural life, and it is our job get our students ready to effect positive change.

field trip. What was going to happen when 33 students were forced to spend eight hours a day or more in a cramped charter bus?

I knew it was time to break down these groups by requiring students to spend time with the people they wouldn't normally chose to spend time with. In class, rather than having the entire class participate in the discussion, I started breaking the students into small groups. I also created rooming assignments for the field trip, which meant that students would have to share a room with different students each night of the trip. The day I made the announcement in class, I became the most disliked instructor in the College of Agriculture and Life

Sciences, at least among the female students in class. The male students made no complaints to me about the decision; however, the female students had a lot to say about my decision and none of it was favorable. I stood my ground, explaining to the students who came to my office to beg me to reconsider that there would be times in life when they might be required to work alongside, or even share a room with, someone who was not their close friend.

The WOW Experience

The trip to and from the National FFA Convention was a turning point in the course. It was amazing to watch some of students branch out and spend time with students in the course with whom they normally wouldn't take the time to get to know. The students' reflection journals revealed that it was the time spent on the trip that helped them to



change their perspective about their classmates. For example, one student wrote, “Wow! There was many people that I didn’t think I would enjoy talking to just by being in class with them, but it changed my view after spending that much time with them [on the trip] getting to know who they really are.” Another student said, “There were several students when I first walked into the classroom that I thought ‘oh Lord, this is going to be a tough class to go through,’ but honestly within those 10 days [of] being stuck on a bus for hours together and sharing rooms with people I have never met change[d] my perspective about them completely.”

Several students articulated feeling guilty about the negative perceptions they had about some of their classmates before the trip, as well as about how important it is to get to know a person before passing judgment. A student wrote in their reflection journal, “I honestly was stereotyping people in our classroom the first day I met everyone. I was judging so hard. And man, was I wrong about every single one of them. And the more I got to know everyone on the trip, the worse I felt about my opinions.” Another student said “I have learned that though it may be easy to stereotype, we must constantly con-

sciously stop ourselves from forming stereotypes, especially without knowing an individual.”

This experience has shown me how important

it is for agricultural educators to teach students about the stereotypes regarding agriculture and the agricultural community that permeate the media. Depictions of agriculture and rural life as downhome, pastoral, simple, or redneck project an inaccurate picture of modern agriculture and farming practices to society. Students who are considering joining the agricultural workforce will be tasked with combatting negative perceptions about agriculture and rural life, and it is our job get our students ready to effect positive change. Providing challenges and opportunities for critical thinking in agricultural education can help students develop the skills needed to understand, communicate with, and relate to those who differ from them in the learning space and in the workplace.

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Book Review: Finding essential takeaways in “Essentialism”

by Tobin Redwine

Agricultural educators do more, go beyond, and stretch limits, but what if we aimed at doing less instead? In a discipline with constant requests to add plates to juggle, “Essentialism: The Disciplined Pursuit of Less” champions a dramatically different tactic. Leadership consultant, Stanford graduate, and New York Times Bestselling Author Greg McKeown challenges readers to achieve the most by deliberately doing less.

Agricultural educators will take solace in McKeown’s specific rationale and strategy for learning to say, ‘no,’ with grace and tact, often gaining respect and securing deeper opportunity in the process.

McKeown ascribes to an ideology that hinges on pursuing only ‘essential’ commitments and activities, determined by deliberate evaluation and prioritization. He compels readers to eliminate distractions to devote maximum energy and time to tasks they value most, enabling superlative focus and success. McKeown explains that choosing to participate in an activity also inherently includes choosing to take time and resources away from something else.

Through reasoned and evidence-based arguments, McKeown articulates an actionable plan for readers to implement his

philosophy in their own contexts. Although he acknowledges that extreme and tedious implementation of essentialism will summon skepticism, he asserts that pursuing less is the most effective way to approach self-actualization.

“Essentialism” leans on the author’s personal experience as evidence for his philosophical claims. McKeown recounts a memorable example which illustrated the pitfalls that his personal pursuit of more created: He left his wife at the hospital immediately following the birth of his daughter to meet with a client. Expecting

admiration from his high-achieving client, McKeown was instead met with disapproval. McKeown’s inability to prioritize caused him to lose favor and—more importantly—lose the chance to share a transcendent moment with his family. McKeown triangulates his claims with business case studies and extensive academic research citations, firmly rooting his ‘disciplined pursuit of less’ in peer-reviewed literature and real-world application.

Agricultural educators will take solace in McKeown’s specific rationale and strategy for learning to say, ‘no,’ with grace and tact,

often gaining respect and securing deeper opportunity in the process. Such practice will undoubtedly prove invaluable when the next well-intentioned request threatens to compromise focus. Learning to evaluate and prioritize activities will enable educators to improve work-life balance and maximize productivity in scholarship, teaching, and outreach, while building a practice of autonomy and empowering discipline. Such tools will come in handy in the next exam season, or stock show season, or banquet season, or countless other times when agricultural educators find themselves doing less but attempting more. McKeown offers a chance to make productivity a lasting season in agricultural education.

Crown Business publishes “Essentialism” in audiobook, hardcover, and digital versions starting at \$12.99, available wherever books are sold.



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Inquiry-Based Learning: You Can Do It!

by Kalynn Baldock and Theresa Pesl Murphrey

Inquiry-based learning has been defined in many ways and in existence since Comenius (1592-1670) and Dewey (1859-1952). In fact, Dewey's mantra of "learn by doing" reflects an important element of inquiry-based learning, which involves active participation. Definitions of inquiry-based learning often include the words hands-on, discovery learning, question-based and/or investigation-based. The National Research Council (1996) defines inquiry-based learning as:

a multifaceted activity that involves making observations; posing questions; examining books and other sources of information to see what is already known; planning investigations; review-

I don't have time! – Actually, it can save you time! If done right, it should take less time.

ing what is already known in light of experimental evidence; using tools to gather, analyze, and interpret data; proposing answers, explanations, and predictions; and communicating the results. Inquiry requires identification of assumptions, use of critical and logical thinking, and consideration of alternative explanations. (p. 23)

As a teacher, this definition of inquiry-based learning can be overwhelming. How could a teacher even begin to consider us-

ing inquiry-based activities in an agricultural education classroom? The challenges associated with this method are real. However, with the right attitude, mindset, and approach, you can do inquiry-based learning activities. The following guidance is based on three years of experience applying these concepts in the high school agriculture classroom.

Common misconceptions:

My class size is too large! -- Inquiry-based learning does not have to be limited to small class sizes with advanced laboratory access. Sometimes, inquiry-based learning can be as simple as students posing a question they want to know the answer for, and then, researching it to collect data. At other times, inquiry-based learning can involve complex experiments to find the answer to a question. The main point to remember is to use what you have available to allow students to take ownership in their learning. The foundation of inquiry-based learning is allowing students to ask questions and find the answer or solution in their own way.

I don't have time! – Actually, it can save you time! If done right, it should take less time. When inquiry-based learning is completely student-driven, the teacher is freed from providing detailed scripts and guidelines. Students come up with the question, construct a plan, and collect the data; the teacher is there to facilitate the learning process.

I don't have training for the inquiry-based approach! – Training

may be useful, but is not a requirement. Let go of the reins to encourage students to answer questions. Utilize inquiry-based guidelines such as the "Essential Features of Classroom Inquiry and Their Variations" grid from the National Research Council (2000) to understand how to modify lessons from completely teacher-driven to a student-driven approach. Allowing students to take charge of the learning process may result in failures; however, students often learn more from a failure than from a success. Inquiry-based approaches merely require allowing students to learn on their own. Sometimes, the teacher is learning as well.

Inquiry-based learning is flawless! - Not every inquiry-based learning activity will work out flawlessly. The more students are provided the opportunity to participate in inquiry-based learning activities the easier it will be for both the students and the teacher. When a lesson does not work as planned, reflect on what went wrong, and try it again.

Best practices, techniques, and approaches:

Don't give students the answer! -- Use probing questions to guide students to the correct answer without giving them the answer. Using question cards is a great way to limit the number of questions. Question cards are a physical reminder of how many questions a student can ask. A question card is a small cutout card with the word "question" or a question mark written on the card. They can be laminated and reused in future lessons, and the difficulty of the lesson can determine how many question

cards students are given. At the beginning of a lesson, give students one to three question cards, depending on the difficulty of the lesson. Students are only allowed to ask a question by giving up one of their question cards. By limiting the number of questions allowed, students are more likely to try to find the answer to a question on their own and save the question cards for more difficult tasks. This process can also encourage them to work together and share their question cards.

Throw away the spoon! -- Don't spoon-feed students all the information. Allow students to find the information and, if necessary, to fail. Failing can be part of the learning process. It is okay for students to fail; the learning is in the process.

Allow students to find the information and, if necessary, to fail. Failing can be part of the learning process. It is okay for students to fail; the learning is in the process.

Patience is a virtue! – Give students plenty of time to explore their options. Students need to inquire about their environment and how things work. For inquiry-based learning to be effective, students need the opportunity to come up with questions and seek information on their own.

One size does not fit all. -- There is more than one way to arrive at the right answer. Inquiry allows students to find answers and evaluate data in their own way. This means there can be a different type of product produced by each student; avoid creating cookie-cutter approaches. Creativity and individuality are important attributes of inquiry-based learning.

Set HIGH expectations. – Students will amaze you! You will be surprised at what students can come up with when they take charge of their learning through inquiry. When given the opportunity, students will often surpass our expectations, sometimes teaching us.

Student-driven versus teacher-driven. - Not every lesson should be completely student-driven. Use the “Essential Features of Classroom Inquiry and Their Variations” Chart from the National Research Council (2000) to determine where your current lessons fall. Then, set a goal to move just one lesson a week further towards the student-driven approach. Use the “Inquiry-Based Learning Guide” provided to help you get started.

When done properly, inquiry-based learning gives students the opportunity to do what they will be expected to do in college and the workforce: solve problems by figuring it out themselves!

Inquiry-based learning can be accomplished in diverse settings – you just need to be willing to try. You can do it!

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The Painting Tells The Tale: The Origins Of Agricultural Education In America

by Barry Croom

In 1588, explorer Thomas Hariot put quill to paper and wrote his most famous work, “A Brief and True Report of the New Found Land in Virginia.” Hariot’s work described the New World in pre-colonial North America, and its inhabitants during his exploration of North Carolina and Virginia in 1585-86.

As a scientist and researcher, Hariot was extraordinarily gifted. He was the first scientist to diagram the surface of the moon, almost four months before Galileo did. During his visits to the Eastern Coast of North America in 1585, he mapped and translated the language of the Algonquin nation, and wrote about the practices of indigenous peoples. In his book, Hariot dispersed a series of water-color paintings by John White. White would become the governor of the first English colony in North America – the infamous lost colony at Roanoke Island on the coast of North Carolina.

In particular, one painting by Governor White offers a rich description of the village of Secotan in the North Carolina Coastal Plain. In the accompanying text, Hariot writes, “For the howses are Scattered heer and ther, and they haue gardein ...wherin groweth Tobacco...They sowe their corne with a certaine distance ... otherwise one stalke would choke the grow the of another” (Hariot, 1588). Hariot’s fractured English tells us that the indigenous peoples portrayed in White’s painting had developed skills at farming.

White painted two fields of tobacco, a hut where guards are posted to keep birds and animals away from the adjacent fields of corn, and a garden filled with pumpkins. And this is where the trouble begins.

When I was in high school, my agriculture teacher told us, agricultural education began when the Vocational Education Act of 1917 passed. High school freshman in agriculture classes circle “1917” on a multiple choice test to the question of when agricultural education began. But this “just ain’t so.”

In John White’s painting of 1585, you can see the representation of the systematic production of crops. We see the indigenous people, growing field crops, practicing integrated pest management, conventional tillage, and diversified crop production – all in one 431-year-old painting.

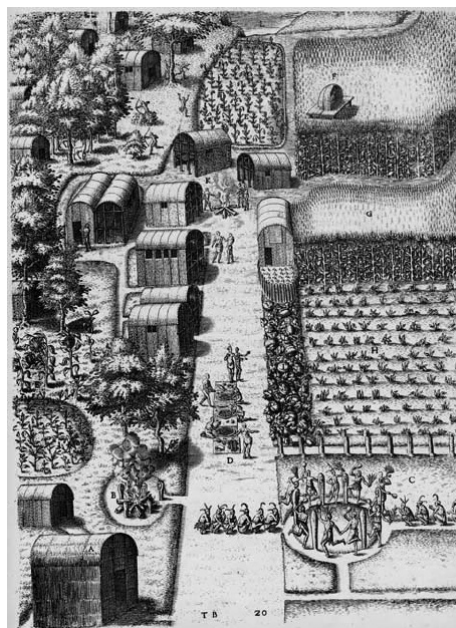


Figure 1 Village of Secotan by John White, circa 1588, public domain image

Indigenous Peoples were systematic in their approach to agriculture, and they employed scientific principles to develop the best production practices. Mohawk Indians in the Hudson River Valley in New York selected the seeds of the best ears of corn and held them over for planting in the next season (Hurt, 1994). James Adair, in his History of the American Indians noted that Indians were quite capable of using integrated pest management when he wrote, “the chief part of the Indians begin to plant their out-fields, when the wild fruit is so ripe as to draw off the birds from picking up the grain.” (Rasmussen, 1975)

The System of Education Among Ancient Indigenous Peoples

Where did the indigenous people learn how to conduct agricultural operations? For agriculture to be well established in 1585, in the coastal regions of North Carolina and Virginia, one could safely assume that someone had figured out how to farm. These early adopters, through scientific methods, had learned the best practices of the era, and had passed them along to their descendants. This is the origin of American agricultural education – among the indigenous peoples who practiced native science to develop new and better ways to domesticate and grow plants, and to harness the power of nature for food and fiber. This should be no surprise to anyone. Meriwether Lewis wrote about the ability of Native Americans to find herds of buffalo in the vast expanse of the Great Plains (University of Nebraska Press / University of Nebraska-Lincoln Libraries-Electronic

Text Center, 2005). You might not think it would be a problem finding a herd of buffalo. If you've visited the plains/hills of North/South Dakota, you know how easy it is to not only lose a herd of buffalo, but lose yourself. Native Americans rarely had difficulty finding buffalo, because they applied scientific methods of observation and experimentation.

Native people openly participated in nature and were not disconnected from it. Living and learning in this type of culture opens the mind to notice interactions in nature and to understand how they develop and produce, how they take in water, nutrients, and grow. Natives learned that buffalo enjoyed grazing on certain species of grasses, especially the tender young shoots that emerged after a prairie fire. The buffalo found these patches of young grass, and more often than not, found Native American hunters waiting there for them (Jones, 2014).

Education Practices of Indigenous Peoples With Regard to Agriculture

Ancient indigenous youth learned agricultural practices in the same way that students in high school agricultural education learn – by doing. They learned by listening and observing elders who had, and still have, a rich source of knowledge and wisdom for which they are well respected. When native students had achieved a certain level of knowledge of an agricultural skill, the elders would allow the students to perform those skills on their own. The modern-day parallel to this is supervised agricultural experience. Elders used stories to teach youth



Figure 2 The Ancient Incas used this terraced field lab to determine the effects of temperature on plant growth. Temperatures vary as much as 27 degrees Fahrenheit from the top of the site to the bottom. Picture by Phillip Weigell

how to live with the Earth as part of the Earth, and how to be responsible to the Earth. Learning was very practical, and applicable to everyday life. The Three Sisters story in the insert is an example of how elders taught the symbiotic relationship between certain plant species, integrated pest management, and plant physiology.

The plants that make up most of our foods crops probably first appeared among 250 million years ago. 249 million years later, Homo sapiens showed up and began to interact with these plant species. Agriculture gradually evolved from our interaction with plants and animals. By 12,000 BCE, the historical record began to show patterns of active agricultural production. In the Western Hemisphere, Mesoamerica and Eastern North America we find ancient evidence of agricultural development (Barigozzi, n.d.; Hancock & Hancock, 2003).

Indigenous peoples were living in ancient cities and civilizations using scientific methods that informed learning by doing. There may not have been schools with chalkboards in ancient Mexico and Central America, but there

were plenty of teachers, plenty of students, and thousands of years of trial and error to learn how to farm. And these precolonial Indians were good at it. In the 1600s and 1700s, farmers of the Iroquois nation produced three to five times more grain per acre than European farmers, primarily because they utilized sustainable agricultural practices (Mt Pleasant, 2011).

The Three Sisters

Before humans came upon the Earth, there were three sisters of the Earth – Corn, Bean, and Squash.

Corn was the strongest of the three sisters. She grew quickly, and was straight and tall. Because she grew so quickly her “feet” would often come out of the ground. The sun would often burn Corn Sister’s feet. Corn Sister’s rapid growth also made her very hungry.

Bean Sister was different. She could not stand on her own. Her vines looped and coiled on the ground. Squash Sister was like Bean Sister in that she grew close to the ground with big leaves.

One day, Corn Sister was complaining about how the Sun burned her feet and how hungry she was. Squash Sister said, “Let me grow next to you and cover your feet with my leaves. That should keep you cool and comfortable in the hot summer sun. And I’ll also keep away the harmful insects and pests that both you so.”

Bean Sister said, “Let me help also. If Corn Sister will let me climb her stalk, I can produce food for both of you since you are also very hungry.”

Because the three sisters worked so well together, they were able to live and grow and produce.

As We See It

John White painted the Village of Secotan as he saw it. Through his eyes, the Indigenous People of North America farmed pretty much like farmers in Europe. But they didn't. Indigenous People utilized companion planting, and shied away from straight rows of crops planted in a monoculture (Woodside, 2016).

Often we forget education is something that happens best by trial and error; by applying a practical form of the scientific method to a problem. The Indigenous peoples of North America demonstrated patient application of scientific principles as one way we learn. The methods of the ancients are similar to the ones we practice today. If agriculture existed more than 12,000 years ago, some form of agricultural education must have existed as well.

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Enhancing Student Learning through Team-Based Learning

by Whitney Figland

Have you ever looked out at your students and thought Man! They just all look so bored? We have all been in those classrooms where the teacher stands in the front of the room and reads off PowerPoint slides while students are left to quickly scribble down notes before they move to the next slide. I was the student frantically trying to write everything down and by the time I was finished writing I couldn't even remember what I wrote because I was only focusing on getting the material written instead of learning. The lecture method of teaching is not inherently bad, but there may be better ways to actively engage students in the learning process. For many teachers choosing the best instructional strategy is no small feat and usually a one-size fits all approach is not the answer.

Employers desire employees who can efficiently and effectively solve problems (Slusher, Robinson, & Edwards, 2011). In today's classrooms, many students are not given the opportunity to build and hone their problem-solving abilities. One strategy to combat this issue could be implementing an instructional strategy that engages multiple learning styles to develop problem solving and critical thinking skills. In order for students to learn those skills they need to transition from passive learners to active learners. One instructional strategy that can promote active learning is Team-Based Learning (TBL). TBL requires students to be active participants in the learning

process and fosters the development of problem-solving skills through collaborative work (Michaelsen & Sweet, 2008).

What is Team-Based Learning?

TBL is a student-centered teaching approach that requires students to work in teams to learn content and solve problems. TBL can be thought of as a modified version of the flipped classroom approach. The teacher's role switches from being a dispenser of information to a facilitator of the learning process. Further, the students are required to become in charge of their own learning (Wallace, Walker, Braseby, & Sweet, 2014). The biggest focus of TBL is to allow for students to gain conceptual and procedural knowledge then apply the gained knowledge to authentic learning experiences (Michaelsen & Sweet, 2008). In the agricultural education classroom, TBL can provide a cohesive hands-on learning experience, which is an important component in the three-circle model. TBL provides an environment for students to become active learners and build the necessary critical thinking skills.

The Process

At the beginning of the semester or course students should be divided into teams. From a practical standpoint, groups of 4-6 people are more manageable. The students will remain in these teams through the entire course and will complete various team exercises together. The main purpose of the teams is to allow for the students to collaborate together and solve problems that allow them

to build higher order thinking skills (Michaelsen & Sweet, 2008). Before the students come to you for questions they should be asking their teammates those questions.

TBL is essentially divided into units/modules that build from basic to more complex topics. Typically, a TBL course is broken down into 5-7 modules and each module takes no more than 2 weeks to complete (Michaelsen, Davidson, & Major, 2014). For example, if you have a semester long small gas engines class you may break the course into six modules consisting of: Safety, Tool and Parts Identification, 4-Cycle Theory and Carburation, Ignition and Electrical Systems, Cooling/Lubrication and Governor System, and Troubleshooting. However, you may find that not all modules need to take two weeks. Some modules, like safety, may only need to take one week. Each module will consist of an Individual Readiness Assurance Test (IRAT) and Team Readiness Assurance Test (TRAT). Before each class meeting, the students will have to complete a reading over the particular module in order to prepare for their IRAT and TRAT. Alternatives to readings may include videos, case studies, e-lectures, or other modes of content delivery.

During the first part of each class session, students will individually complete their IRAT over the material. The students then receive immediate feedback regarding their performance on the IRAT. After completing their IRAT, the group will work together to complete the TRAT. The theory of the TRAT runs on the premise of two heads are better than

one. The TRAT allows for the students to collaborate on questions and try to determine the correct answers together. Many of you may be thinking what is the purpose of taking the IRAT and TRAT back to back? From an educators' perspective as well as a student that has taken a TBL structured course, I like to have the student complete the IRAT then implement a class discussion to ensure the students have a grasp on the content prior to completing the TRAT. After the IRAT and TRATs have been completed, the remainder of the course is dedicated to hands-on application exercises. For example, if your students were on the 4-cycle theory and carburation module, their application exercise may be to diagram Bernoulli's principle and then disassemble/reassemble the carburetor of their small gas engine.

Costs

The main cost attributed to implementing TBL is the scoring system for the IRAT/TRATs. As described above, each student will be taking an IRAT over every module and then every team will take a TRAT over every module. Most educators who implement TBL use Immediate Feedback Assessment Technique (IF-AT) forms. This allows for immediate feedback on the IRAT, which allows the teacher to know where to focus the class discussion. Traditionally, IF-AT "scratch off" forms are used to for this purpose. Using the IF-AT forms allows for real time feedback on their answers and allows students to receive partial credit. This real time feedback, also allows the students to appeal any questions that they have answered incorrectly. However, the IF-AT cards do have

some limitations. When ordering the IF-AT forms you must order consist of a minimum of 500 IF-AT forms, which costs \$115.00 for 25 questions/4 answer choices per card. Computer-based alternatives such as GradeCam can be utilized instead of the IF-AT forms. GradeCam works on the same premise as IF-AT forms, but the students do not have the opportunity to receive immediate partial credit for wrong answers. However, GradeCam still provides immediate feedback on wrong answers, and the students can appeal wrong answers to receive partial credit. GradeCam cost's is considerably lower then the IF-AT forms. GradeCam costs around \$180 per year per teacher, but allows for an unlimited number of students on a roster.

Summary

Overall, TBL is based on sound pedagogy that allows for active student learning. TBL provides a structured learning environment that builds collaborative learning skills and gives students the opportunity to learn conceptual/procedural knowledge and apply those skills to a real-world experience. If you are looking to change things up in your classroom, TBL may be a great option!

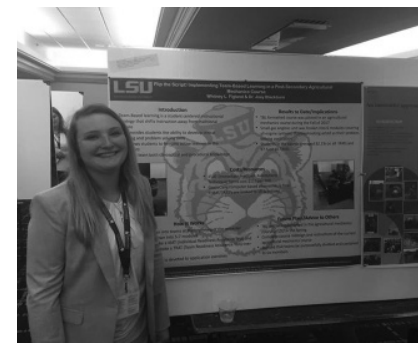
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*Be Distinguished...**Differentiated Instruction in your AG ED Classroom is Attainable*

by Kailee Morris and Catherine DiBenedetto

Agricultural educators teach a diverse group of students that vary in ethnic background, age, learning style, and learning needs. Agricultural education programs have always been able to provide a curriculum to assist learners with special needs due to the focus on experiential learning activities and real-world application that prepares students for college and careers. Since 1975 federal law has mandated the inclusion of special needs students in the same classroom with general education students. Challenges for many agricultural education teachers have emerged. The number of students with learning disabilities in agricultural education programs has increased around the country. With federal legislation demanding more inclusion in the classroom, it is crucial that agricultural educators utilize differentiated learning strategies. If the needs of students with learning disabilities are not accommodated then the agricultural industry risks losing up to 25% of the workforce. Many agricultural education teachers need strategies to differentiate class/lab instruction to better accommodate students with a variety of learning disabilities to assure their students are actively engaged throughout the learning process.

What exactly is differentiated instruction? Differentiated instruction is allowing students to have multiple options for taking in information, making sense of the information, and how they express their learning.

Differentiating instruction provides different strategies for acquiring content, processing and making sense of ideas, and to developing products that reflects students are learning effectively. Agricultural education teachers are challenged to proactively plan a variety of ways for their students to express learning and be assessed on their ability to meet the learning objectives. Variety and choice in assignments or assessments does not mean giving more work to an advanced student and less to a struggling student. Many students that are struggling need additional support to scaffold the lesson and individualize the instruction to their particular needs. The idea behind differentiation is to use a student-centered approach. Each student will find an experience different in engagement, relevance, and interest. When you effectively use differentiated instruction strategies, you provide multiple approaches to content, process, and product.

Content is what we teach or the information we want our students to learn. Differentiating instruction by content means that we can either adapt what we teach or we can alter how we give students access to what we want them to learn. We can adapt what we teach by having students work on different topics. Advanced learners are not learning more throughout the school year but instead they may be expanding further on knowledge they have already mastered. When adapting your instruction by the access students have to resources, we have advanced students working more independently and struggling learners having more dependence on you as a teacher or in peer groups. Grade level

textbooks often do not meet the needs of all the students in your classroom. Using a variety of supplementary materials can increase the number of students that you reach and enhance the literacy for all students. With the advancement of technology, many classrooms now have access to some version of a tablet which provides internet connection allowing teachers to differentiate textbooks and resources even more for individual student needs.

Process allows differentiation for learners to process the content or skills that have been introduced to students. The process is the essential component to learning and instruction because students either lose or confuse the new information. Activities are used to help further clarify conceptual notions of topics and for students to move from a basic understanding to a more complex level of understanding. The activities used to differentiate processes should call on students to think at higher levels and cause the students to use a key skill to understand the key ideas. The important concept to differentiating process is the quality and focus of what students do. Using tiered assignments or parallel tasks at a variety of difficulty levels are useful when differentiating by process because it engages students to give a different thinking or processing response.

Product differentiation is a long-term endeavor. The assignments used to differentiate by product help students rethink, use, and extend what they have learned over a period of time. These assignments can be highly motivating for students because they have the creator's thumbprint

and assess a student's knowledge, understanding, and skill. These assignments can replace or be combined with assessments to maximize opportunities for students to show that they have mastered a skill. Alternative assignments allow students to see how the knowledge and skills they have learned apply in a real-world setting. However, when using product assignments or assessments, the students need a clear definition or example of quality work to meet the learning objective, regardless of the presentation.

There are three characteristics of students that are the driving force behind differentiated instruction: readiness, interest, and learning profile. You can differentiate one or all of the key components of curriculum by readiness, interest, or learning profile. Differentiating by readiness means that you are matching tasks to students' skills and understanding of a topic. Tasks that are matched for readiness should push students a little beyond their comfort zone while supporting the bridge between the known and unknown.

Activating students interest is a key feature of teaching. Students are highly motivated by student interest and student choice. If a student has any interest in a topic regardless of how small, they are more likely to learn. Similarly, when students are given a choice about how they learn they also gain interest in the topic. When considering activities that appeal to your students you can draw on an existing interest or expand the students' interest to introduce them to a world of new ideas and opportunities. Engaging relevance is important for students to link their interest to the key components of the curriculum to demonstrate learning.

Learning profile is how you as an individual prefer to learn. Each student is aware of how they learn best and some ways that are not effective for them to learn. A student's learning profile is influenced by their culture, gender, intelligence preference, and learning style. Some students need noise and movement to learn while others prefer silence with a sparse room to prevent distractions. Culture influences how students prefer to learn whether its individual or in group settings on creative or concrete aspects. Male students and female students often prefer differences in the way they learn based on their gender. Competitive or collaborative settings between peers can provide differences in the way students learn. Gardner's theory of multiple intelligences plays into a student's learning profile. Multiple intelligences are thought of as brained-based predispositions that everyone has for learning. No one can create the perfect classroom for all students at the same time. If you can help your students to reflect on their own preferences, then you have a better idea about how to differentiate your instruction to meet the needs of the vast majority of your students.

Teachers can use content, process, and products as starting points for differentiation that will make modifying curriculum and instructional methods easier. Students with special needs are achieving more than just joining the workforce, but are pursuing degrees in college. Students with learning disabilities are not suffering from mental retardation or low intelligence, but have needs that arise from social, psychological, linguistic, and cultural differences which can make inclusiveness in one class quite difficult.

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Gardening! Agricultural Education Programs Promote Learning by Doing

by Gale Wells-Brickhouse and Paula E. Faulkner

The question posed, “What type of individual learns by doing?” This article will support the answer that they are, “active learners”. Brickers said, “Children (and adults, for that matter!) learn best by doing. You may have heard it like this: “Tell me and I forget. Show me and I remember. Let me do and I understand” (2005, p. 5). Ezekiel continued, tactile [active] learners often: 1) perform activities for themselves to have the best chance of learning; 2) remember best the activities they experience; and 3) participate in learning that involves use of the whole body rather than just hands-on (2007, p.1). Major (2016) follows with, “Learning strengths of tactile-kinesthetic learners include them: 1) remembering what they do, what they experience with their hands and bodies; 2) enjoying the use of tools or lessons which involve active/practical participation; 3) remembering how to do things after they’ve done them once (motor memory); and 4) using good motor coordination (p.1).

In Gale Brickhouse’s agricultural education program, each of these tasks listed above, are integrated in her lessons. At Northwood High School, students learn concepts in Animal Science and Horticulture. In the laboratory, active learning occurs in the greenhouse and with animals like chickens, rabbits, gerbils, guinea pigs, and a gecko. During the fall/winter seasons, students grow spinach, kale, tomatoes, and peppers, from sowing seeds and pulling weeds.

Brickhouse ensures lessons follow state curriculum. The North Carolina Department of Public Instruction (n.d.) defines the Standard Course of Study as follows:

“These standards define what students know and should be able to do”. (p.1). Her lessons also follow the framework of Bloom’s Taxonomy (see Figure 1). Bloom’s is a classification of the different objectives and skills that educators plan for to promote student learning (Shabatura, 2013). There are six levels to Bloom’s, each requiring a higher level of abstraction from the students (Kelly, 2017). One popular lesson Brickhouse teaches year-to-year is the Gardening Activity.

Gardening Activity and the Revised Bloom’s Taxonomy

Each level in Bloom’s is fulfilled as students engage in activities and work with each other. From Remember to Create, students as well as Brickhouse work to achieve the ultimate goal, which is to learn, grow and share fresh fruits and vegetables with the school community. Each task follows Bloom’s Taxonomy as provided below:

Remember-Students complete worksheets based on a previous lesson where they are explained how to use different soil mixes. Students identify gardening tools and safety practices to follow. An assessment on tool identification is administered to make sure students master the step before moving to the next step.

Understand- Students complete worksheets on basic horticulture principles and practices. The work-

sheets include questions concerning classifications of plants, such as the difference between annual, biennials and perennials and how they germinate.

Apply- Students demonstrate the proper procedure for mixing a horticultural media for a given situation.



Students mix the horticultural media needed to sow seeds and maintain a record book to record soil types used for each crop.

Analyze -Students research cultural needs for the variety of fruits and vegetables and for organic requirements. Students are expected to complete worksheets using the textbook and computers to research growing needs for each plant that includes the type of soil media, water and sunlight. Students maintain a record book to record plant growth and work in pairs and groups to discuss what they learn.

Evaluate- Students compare each of the scientific method steps and explain the importance during presentations of their research papers. Students use rubrics to guide their research on what soils should be used during the planting of seeds in greenhouse and the best soil types needed for optimum plant growth.

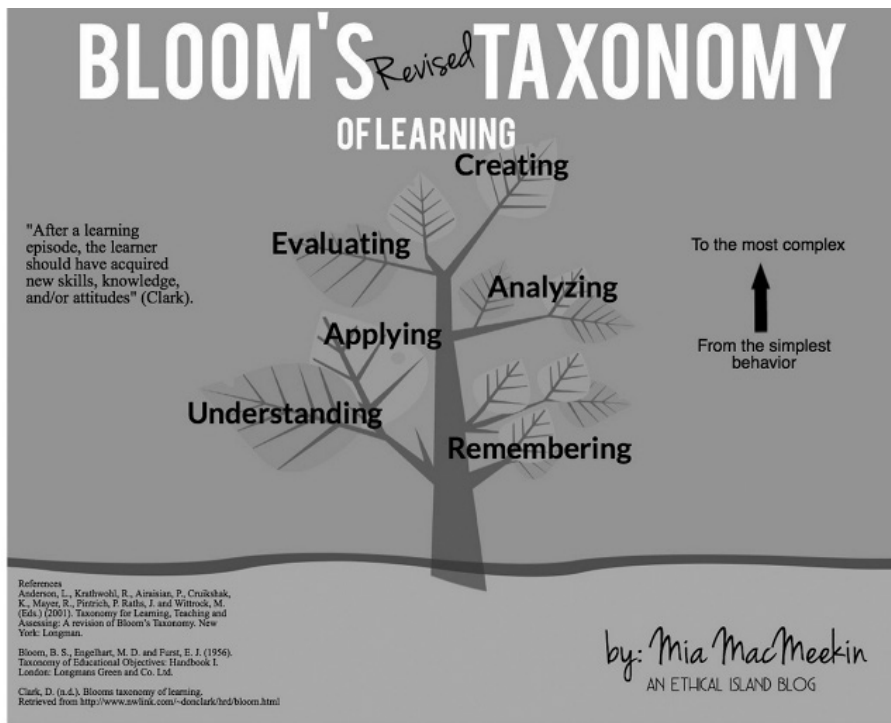


Figure 1. Bloom's Revised Taxonomy of Learning

Create- Students maintain a vegetable garden by designing a rotational plan during spring, summer and fall growing seasons. An exam is administered at the end of the activity to assess student-learning outcomes.

Conclusion

The Gardening Activity allows students to move from Remember to Create, all while being active, learning, collaborating and having fun. During the activity, students take turns checking the greenhouse plants by watering and fertilizing. Students demonstrate how to keep plants alive and growing. They are encouraged to ask the “why, when, how, what, and where” to problem solve and use critical thinking. Brickhouse says of her students, “they are such creatures of habit, that even when she, at times, is in a rush to pot the plants, they remind her that the correct type and amount of soil must be used”.

In a report conducted at Corinthian Colleges, Inc. (2014), researchers examined the importance of “hands-

on training” in educational environment. The majority of participants found active participation and hands-on learning as the best method.

While the main goal of The Gardening Activity focuses on promoting active learning, Brickhouse acknowledged that the activity also promotes other types of student learning such as Science, Technology, Engineering, and Mathematics (STEM), especially when students transfer what is learned in the agricultural education classroom to other academic classrooms, such as Science. For instance, Hossain and Robinson (2012), report that in past decades, a decline in STEM achievement, along with a decline in interest in these disciplines concerning U.S. elementary, middle, and high school students, has posed a serious threat to the future of the STEM workforce.

Integrating STEM components applied in Agricultural Education viewed as ever more so important. Haug (2011) reported that the agriculture high school environment is

becoming heavily looked upon by administrators as a way to bring relative meaning to core academic content that often seems to be a vast wilderness to so many students” (p. 7). When explaining how STEM is a part of agriculture as Brickhouse’s lessons accomplish it enhances students’ motivation to learn. For example, Ejiwale (2012) noted the special importance of engaging students in “motivational activities that integrate the curriculum to promote hands-on and other related experiences that would be needed to help solve problems as they relate to their environments” (p. 91). Therefore, agricultural and STEM education have been a natural combination. Indeed, school-based agricultural education (SBAE) has been so diverse the philosophy of agricultural education has emphasized the process of learning by doing over the specific content learned (Phipps & Osborne, 1988).

Brickhouse also expands on how the Gardening Activity is perfect for preparing students for possible Supervised Agricultural Experiences (SAEs), which provides them with individualized op-



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portunities to learn and develop real-world skills outside of the classroom and beyond the school day (National FFA Organization, 2015). Elliott and Nickels added, they [SAEs] are an important part of Agricultural Education, because it is the experiential component of the program (2008, p.11). Brickhouse values SAEs for enhancing her student's learning, such as having them work with local food banks, shelters and soup kitchens, which can lead to possible careers.

As the question is posed once more, "What type of individual learns by doing?" Well, the question is easily answered by observing students in Gale Brickhouse's agricultural education program. She believes that whatever the season, her students are always "learning by doing"! Next season, the Gardening Activity will be offered...who is ready to enroll?

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Engaging Non-Traditional Students in All Three Aspects of a School-based Agricultural Education Program

by Victoria Willis, Raleigh Dawson, Anna Johnston, and Catherine DiBenedetto

While many students involved in School-based Agricultural Education (SBAE) programs come from agricultural backgrounds, not all students enrolled have farming experience. Many students come to SBAE programs from urban or suburban areas and may have never been given the opportunity to experience farm production or the agriculture industry. As agricultural educators, it is our responsibility to ensure all students feel welcome and accepted within the Agricultural Education program, regardless of background. An effective SBAE program focuses on all three aspects of the Agricultural Education program including classroom/lab instruction, the National FFA Organization, and Supervised Agricultural Education Programs. All three of these aspects of the three circle model allow for the opportunity to engage and incorporate non-traditional agricultural education students.

Classroom/Lab – Diversify the Curriculum

The classroom/lab is a key component of the agricultural education program. As an agricultural educator it is important to recognize the fact that some students entering into your classes will have experience in agricultural production from their home life

or family members, while some students have no experience within the industry. Agricultural education programs based in non-traditional farming communities offer up a challenge to the program by potentially having limited access to land labs. Utilizing community resources can fill this void and strengthen the bonds of the program with influential agricultural leaders in the community. Reaching out to farm families, community farms, or industries provides experiential learning opportunities for students, while also encouraging them to explore possible careers for their future. Within the classroom setting, educators can embrace diverse learners by using student experience as a resource. Allowing students to share their personal agricultural experiences bridges the gap between technical knowledge gained in the classroom and hands on application outside of class. A possible teaching strategy would be to pair up non-traditional agriculture students with traditional agriculture students in an effort to make the curricula more relevant and applicable at a personal level. Our responsibility as educators is to ensure all students receive the dissemination of adequately leveled material. By not assum-

ing that all of the students involved in the program come from agricultural backgrounds, we can better assess the academic needs of the class and connect all students to the curricula by diversifying what we teach.

FFA- Identify Non-Traditional Role Models

Bringing in non-traditional members of the agricultural industry embraces diversity. Incorporating these members in the community creates role models for non-traditional students. By reaching out to the community, the program connects with non-traditional families, recruits, and highlights the importance of the FFA program. By bringing in local agricultural businesses, entrepreneurs, and other non-traditional industry professionals, students are better able to see the diverse opportunities available in agriculture, other than strictly careers in production. Examples of non-traditional agriculture careers and opportunities could include apiaries, foresters, plant propagators, and scientists in research and development.



Utilizing these industry professionals within FFA activities, speakers, and CDE preparations, students are given the opportunity to form relationships and mentorship within the agricultural industries. FFA activities can be geared towards non-traditional agriculture students through the use of community gardens, family nights, and parent involvement. By incorporating activities which students perform in their daily lives, such as gardening or eating, educators can marry agricultural concepts to day to day activities, in an effort to allow non-traditional students to see agriculture's presence and relevance in all forms. Utilizing FFA as a resource can provide all students with the opportunities to develop leadership and personal connections with peers and the community. It is crucial for agricultural educators to convey the mission and purpose of the FFA organization, while also demonstrating the impact the organization can have on non-traditional students' lives.

SAE – Utilize Community Resources

Utilizing resources such as SAE idea cards, community resources, and brainstorming techniques can encourage non-traditional students to become more heavily involved in an SAE project. By taking students' interests into consideration, we are better able to engage non-traditional students in an SAE project. As an educator, it is our responsibility to assist students in choosing an SAE project which relates to agriculture as well as personal interests and possible career goals. Taking advantage of school-based enterprises allows students to demonstrate skills such as accounting, record keeping, and managerial skills. Technical skill proficiency has the potential to impact students' career goals, even if they choose to pursue a career outside of an agricultural

field. Students may become aware of careers they never knew existed.

The community can serve as an integral component for SAE projects. An example may be managing social media for local livestock associations, agriculture businesses, or local producers. Agriculture teachers have the ability to highlight non-traditional students' skill sets through SAE projects by intertwining students' skills and ideas with local agriculture. Educators need to build personal relationships with their students in order to best assess how to guide student' SAE projects.

Classroom/lab, FFA, and SAE are all integral parts of the three circle model for a SBAE program. All three of these aspects can be enhanced to appeal to non-traditional agricultural education students. The classroom/lab should create a welcoming environment to all students, regardless of background knowledge. Opportunities through traditional agriculture students and local producers should be incorporated into curricula in order to enhance relevant knowledge for all students. FFA should be marketed to all students as a venue for highlighting leadership skills, strengthening bonds among peers, and linking classroom knowledge to community industries. The impact and importance of FFA should be articulated to all students from all walks of life. Incorporating non-traditional agricultural activities within the FFA organization can appeal to non-traditional student interests. SAE projects should allow students to identify goals and measure growth and knowledge as individuals in agriculture regardless of future career plans. The SBAE program can embrace diversity of traditional and non-traditional students.



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