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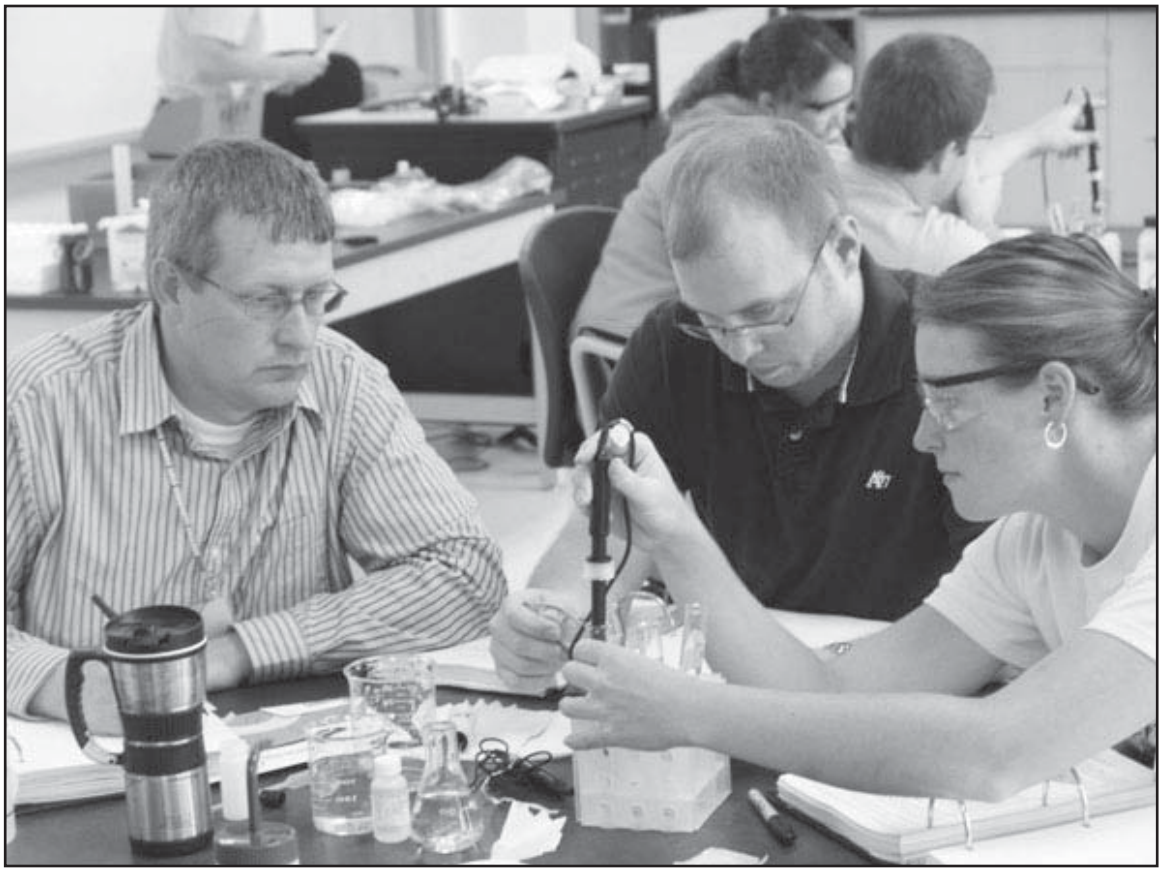

Potpourri

EDITORIAL

Alex: I Will Take "Potpourri" for $1000.

by Harry N. Boone, Jr.

Articles in *The Agricultural Education Magazine* have traditionally centered on themes. As Editor for the past two years I have followed the same format. Keep in mind that the *Magazine* is twenty-eight pages in length: no more, no less. There are features that must go in specific issues such as the upcoming themes, the index of publications, the statement of ownership, etc. For one reason or another, occasionally I will have to cut a potential article that had been requested/submitted for a theme. It's tough telling an author that their article has been cut due to space limitations. I always promise to include it in a future issue if space permitted. To be honest, opportunities for non-theme articles to be published are few and far between. As a result I tried to think of a way to publish articles that had been cut from *The Agricultural Education Magazine.*

I am a big Jeopardy fan. Occasionally they have a category called "Potpourri" which features questions that were not used because of time limitations of the show. The combination of being a Jeopardy fan and Editor came together into an idea: why not have a "Potpourri" issue of *The Agricultural Education Magazine* which features a series of non-theme articles?

Dr. Deborah Boone served as the (non) Theme Editor. After reviewing the available articles, we decided she would need additional articles to complete the issue. She put out a call for proposals on the listserve and the response was overwhelming. In forty-eight hours she had to send out a message stating that she had enough proposals. There are many individuals willing to share their expertise and experiences with the profession. They were just waiting for a chance to do so. With the overwhelming response, this appears to be an idea that should be tried again. I would be interested in hearing your opinions. Take a few minutes and send an email message to hnboone@wvu.edu and let me know your thoughts on this issue.

The Total Agricultural Education Program

As a former agricultural education teacher and current teacher educator, my philosophy of agricultural education is rooted deeply in the total agricultural education program model of classroom/laboratory instruction, experiential learning through supervised agricultural experience programs (SAEs), and leadership through membership in the National FFA Organization. Too often I see one or more of the components missing. In my opinion the future of agricultural education rests upon the full implementation of the total program.

Many times I hear the argument that "you cannot force students to join the FFA." That may be true but it does not relieve you of the responsibility of providing leadership training to all of your students. Every student should have the same opportunities to develop their leadership skills, the ones who join the FFA will have the opportunity to lead the chapter and represent it at the regional, state, and national levels.

Another concern is the number of students with SAEs. Today less than three percent of the population are actively involved in production agriculture. If you are limiting your students to production or placement SAEs, many of your students will not have the opportunity to apply the skills learned in the classroom to real life situations. Just as the agricultural industry has changed over the past one hundred years, so has the opportunities for student experiential learning through SAEs. There is not a student in your program who cannot complete an exploratory SAE by attending an agriculture career fair or creating a report or documentary on the work of an agriculture professional. Research SAEs offer students an opportunity to apply knowledge learned in the classroom and to possibly generate new knowledge that will help the profession. Often this is accomplished through the student designing and conducting a scientific experiment. The possibilities available to the student are limited only by their imagination and the facilities available to conduct the experiment.

As an agricultural education teacher you must ask yourself if your instruction is meeting the needs of your students. Does your program consist of state of the art practices? Do you use a variety of teaching methods? If the answer to any of these questions is no, you have some room for improvement.

Dr. Harry N. Boone, Jr., is an Associate Professor at West Virginia University and Editor of ***The Agricultural Education Magazine.***

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E-mail: NAAE@uky.edu

Article Submission

Articles and photographs should be submitted to the editor or theme editors. Items to be considered for publication should be submitted at least 90 days prior to the date of the issue intended for the article or photograph. All submissions will be acknowledged by the Editor. No items are returned unless accompanied by a written request. Articles should be typed double-spaced, and include information about the author(s). One hard copy and one electronic copy of the article should be submitted. A recent, hardcopy photograph should accompany the article unless one is on file with the editor. Articles in the magazine may be reproduced without permission but should be acknowledged.

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Potpourri: A Miscellaneous Collection

by Deborah A. Boone

Ever stop to think about how the agricultural education programs across your state or the nation differ from the program in your school? Ever wonder what unique educational programs, teaching methods, and approaches to subject matter others are utilizing in their programs and how they might enhance your program? Agricultural education programs are truly a potpourri of subject matter offerings and opportunities.

A quick online check for potpourri in the Merriam-Webster dictionary, found "a miscellaneous collection" as the second definition, while the first definition is listed as: "a mixture of flowers, herbs, and spices that is usually kept in a jar and used for scent." Although agricultural education is truly a miscellaneous collection, it was the first definition that prompted an analogy to agricultural education. There are so many programs and teachers out there with outstanding programs (flowers), ideas (herbs), and experiences (spices) that too often are "kept in a jar" and "used for scent" (when requested) and many times are never shared with colleagues. The fact that many folks within the profession are willing to share their ideas and experiences with others is evident by the overwhelming response I received to a call for proposals for this potpourri edition. This reminded me that just like the gardener, agricultural educators are willing to share their flowers (programs), herbs (ideas) and spices (experiences).

Many times potential articles do not fit a proposed theme, so the ideas lie dormant in the hands and minds of agricultural educators waiting for just the right opportunity to share a wealth of information. This edition of *The Agricultural Education Magazine* is a miscellaneous collection of programs, ideas and experiences which highlight ways to build strong and relevant agriscience programs.

We begin this issue exploring ways to teach problem solving, by allowing students to take responsibility for their own learning in the article, *Agriscience Practically Teaches Itself*. The article challenges us to think about are we really teaching our students to problem solve? Are we willing to ask students to solve a problem where we don't know the answer? The authors outline four steps to allow students to apply the science of agriculture. The last step relates to utilizing the FFA's approach to motivating and rewarding student learning in agriscience.

While thinking of applying the science of agriculture one can explore ways to use school gardens. The article *School Gardens: Ripe with STEM and Experiential Learning; Fertile Soil for Agricultural Program Growth*, explores all the classroom, SAE and FFA possibilities and opportunities a school garden provides. The authors discuss how school gardens managed by agricultural students can lead to program growth by making agricultural education programs relevant to many students while increasing the rigor.

While many agricultural education programs still tend to focus on production agriculture; there are also a number of programs which incorporate conservation and wildlife management into their curriculum. In the articles entitled *Incorporating Conservation Education in Agricultural Education* and *Relevance Rigor and Authenticity in Ag Education: A Practical Approach to Achieving All Three* the focus is on conservation education and wildlife management to help students become better stewards of the environment and more respectful of wildlife management programs.

The arrival and rapid dissemination of digital technology has left many educators on the wrong side of the digital divide, struggling to teach a group that speaks a totally different language. In a world where most students K-college grew up with technology as an everyday and essential part of their life, today's students think and process information distinctly different than previous generations. Yet the "digital natives" find themselves being taught by "digital immigrants." Digital immigrants are those of us who were not born in a distinctly digital world, but have either been fascinated with or forced to adopt the new technologies. Digital immigrants tend to hang on to the things we are accustomed to, while learning the new language. You are most likely a digital immigrant if you print out your emails, or send an email or text and then follow-up with a phone call. *Baby Boomer Turned Digital Native: One Teacher's Jour-*

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Agriscience Practically Teaches Itself

by Nina Crutchfield and Larry Lyder

So often we are quick to avoid new teaching strategies, making excuses like "I don't have time to learn something new," or "what I do already works," or "that won't work with the students I have." Rather than making that snap judgment regarding the infusion of agriscience into traditional production-oriented classes, ask yourself this question: "Why am I working so hard when the students could be shouldering more of this learning/teaching relationship?"

Teachers who have truly embraced agriscience, to the benefit of the most basic lessons of production agriculture, are finding that their students are willing to take on more responsibility for their learning and as a result, agriscience practically teaches itself. These teachers find themselves becoming the facilitators of learning rather than the "sage" who delivers knowledge and expects bored, disengaged students to simply regurgitate information on a paper/pencil test.

Step One: Find a Problem to Solve

Industry keeps telling us we need to turn out graduates who can problem solve (Partnership for 21st Century Skills, 2008). We like to think that we teach our students to do that, but are we really? Consider your teaching methods. How often do you ask students to solve a problem where **you** may not know the answer? The industry and science of agriculture goes far beyond what is contained between the covers of any of our textbooks or any one of us can know. There are questions just waiting to be asked and then answered by tomorrow's agriculturalists.

ALL agriculture students need to ask a question and then find the answer for themselves. As their teachers, we help them find their question and then guide them along the path to their answers. Yes, it is possible for every student to pose a question, no matter how simple or ability-appropriate it needs to be. The key is for the question to interest the student enough to want to find the answer.

A perfect example lies in the consideration of the monumental questions that baffle teenage boys around the world: "Which is better, Ford or Chevy?" and "What attracts girls to certain boys?" While alone these topics seem trivial and juvenile to us, they speak to where many of our students exist. Proven by the hours of debate they inspire among our students. Take that youthful zeal, turn it into a learning experience, and make it productive. It just might ignite a new vehemence for agriscience neither you nor your students knew existed.

> Students are willing to take on more responsibility for learning.

Step Two: Learn from Others

Most students are stunned to realize that the questions they debate daily have been asked by many before them. Assisting them in finding postulated answers, developed by previous researchers, is a way to really evaluate the strength of their own arguments, as well as teach them to hypothesize their own thoughts. They are liable to find endless amounts of research regarding marketing strategies, preferred characteristics, and odor partialities (in the case of the car and girl questions).

Step Three: Tackle the Problem

A great agriscience educator teaches their students the scientific method, a time-tested means of solving problems that can be applied to virtually any situation. After students consider what people have done before them, have them propose their own solution or theory regarding the problem. A great example of how effectively this strategy can be used was done by a teacher and student in Oklahoma. The young man attempted to answer the age old question "Which is better, John Deere or Case tractors?" The student hypothesized that Deere tractors were superior because the brand offered more implements. Through the scientific method he determined that the John Deere tractor was more desirable among his study participants, but not for the reason he hypothesized. He found they were more popular because the implements had more interchangeable parts, reducing down time for producers when repairs needed to be made. In speaking with the student, the findings were unexpected and led to even more questions and research for his future. The simplest question can direct a student down a completely new path.

Step Four: Use FFA Awards and Contests to Motivate and Reward Learning

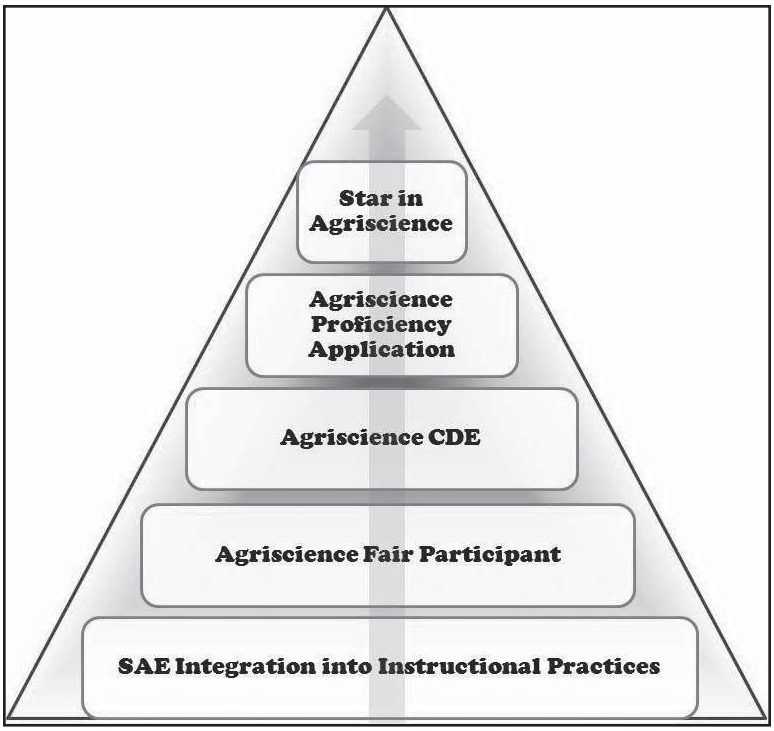

Figure 1. A model of FFA's approach to motivating and rewarding student learning in agriscience. (developed by authors)

While this may come as a shock to some, the real purpose of FFA is to provide real-world simulations that attempt to motivate and reward students for learning. As agricultural educators we are masters at using our subject matter to teach academic standards, then using FFA awards and events to provide an application and reward for their learning. When teaching agriscience, we can direct those simple questions that students have toward an agriculture application. The best ag teachers look for a way to channel those agriscience questions toward an agriculture career pathway-- Animal Systems, Environmental Services/Natural Resource Systems, Food Products and Processing Systems, Plant Systems, Power, Structural and Technical Systems, and the new Social Systems (not a career pathway but an added dimension to agriscience events and awards). This effort facilitates participation in an agriscience Fair at the local, state, and national levels. The competition helps students evaluate their work objectively, ensures they practice their communication skills, and engages them in the exercise of justifying and defending their work. All tasks that industry says are important in all employees (Partnership, 2008).

Industry also tells us they want graduates who can work together to solve problems (Partnership, 2008). In 2014, National FFA plans to launch the Agriscience Career Development Event toward that end. It is anticipated that the 4-student team will conduct a research project on a local issue then present their findings to a panel of judges. In addition, they will perform a team activity regarding a research scenario, much like a Request for Proposals, where they design a research project around the scenario. Individually, the students will critique a research paper and complete a knowledge exam.

As students extend and grow their research skills beyond their initial question and CDE competition, they can look to the new agriscience research proficiency award for even more motivation. Following the same premise as the technical proficiency awards for production and placement SAE's, the agriscience research proficiencies will reward students who engage in multiple research efforts, exhibit growth as a researcher, and engage partners in their endeavors. The application will serve as a portfolio, documenting an FFA member's efforts to answer agriscience questions, employ the scientific method, and ensure ethical practices.

Students can progress from their classroom experiences in agriscience to participation in competitions such as the agriscience fair and CDE, reach proficiency, and ultimately work toward achieving the level of a Star in Agriscience (see Figure 1) . Presented at the local, state, and national levels, the Star in Agriscience is the pinnacle of achievement for FFA members engaged in agriscience research. While meeting the SAE requirements for productively earned and investment and/or hours employed, the Agriscience Star candidates must have an

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School Gardens: Ripe with STEM and Experiential Learning; Fertile Soil for Agricultural Program Growth

by Shannon G. Lawrence and John Rayfield

School gardens

Teaching agriculture is one of the best professions out there. Admittedly, teaching agriculture through agricultural mechanics or livestock is where the most comfort lies for these two teachers, however, there is much merit in school gardens and perhaps even a need for more of them in agricultural education programs. Although the United States has a rich agricultural heritage, school gardens have only formally been part of our educational history since Henry Clapp of the George Putnam School in Roxbury, Massachusetts helped students plant a garden in 1891 (Greene, 1910). School gardening has been a national movement before in the United States, but waned during the 1950's due to a national emphasis on technology (Blair, 2009). Over the last 20 years, school gardens have again become a national movement though many of the gardens and curriculum target the elementary level (Blair, 2009). With societal trends such as the local food movement, urban gardening, community gardens, Community Supported Agriculture (CSA), Farm to School, and other programs centered on locally produced farm products, agriculture educators have several unique opportunities to expand their programs. School gardens incorporated into an agricultural education program can offer a plethora of opportunities in the areas of agricultural literacy, community outreach, economic growth, student involvement, and program growth.

School gardens managed by agricultural students provide opportunities for achievement and multifaceted engagement. Looking at a garden through the lens of the three circle model, many teachers probably already have ideas of how to best utilize a school garden. The ideas may range from helping to teach plant science to expanding the areas of SAEs, to making science more relevant by integrating Science Technology Engineering and Mathematics (STEM) with the gardens. The ideas presented in this article are the product of conversations with agriculture teachers, observations, experiences, and reflections. It is the intention of the authors to hopefully motivate more agriculture teachers to think about and incorporate school gardens in their programs.

School gardens provide opportunities for achievement and multifaceted engagement.

Classroom Possibilities

A school garden, incorporated into our program, opens up numerous opportunities for instruction. The level of rigor in our programs can be increased by having a school garden, even a small one. The garden offers an ideal area to teach and reinforce ideas and concepts about plant science, biology, chemistry, soil science, math and other STEM principles. While this short list is not all inclusive, look at each subject mentioned and do a quick brainstorm of the topics. Agriculture teachers will most likely generate a lot of ideas of how a garden could work if they aren't already implementing one.

Agricultural business, agricultural systems management, landscape design, and crop production lessons can offer another instructional area for teachers and continue to offer real life applications for our students. Who can argue against making our programs relevant to many students and increasing the rigor? Allowing students to form groups and having a gardening competition can really produce interesting problem solving techniques as well as an abundance of food. Once the food is produced, the students may want to disperse it in ways we may not think about. Some schools work with local chefs, school food service personnel, nursing homes, hospitals, homeless shelters, and florists to enhance the learning process centered on the garden. Other programs use the produce for FFA meetings or taste tests during FFA Week. The possibilities are great and even greater when we tap into the creative power of students.

SAE Possibilities

Supervised agricultural experience can be one of the most exciting components of agricultural education. School gardens offer numerous opportunities related to SAE projects. Many programs house animal projects on school grounds in a livestock facility. Programs that cannot house animal SAE projects, due to space, may want to look to school gardens as a viable avenue for offering on campus SAE projects. Gardens (traditional or raised beds) can be compact as well as non-environmentally intrusive, which makes them an option at almost any school. While not every student will be interested in gardening and producing fruits and vegetables, gardens can provide more SAE options for non-traditional students as well as provide valuable life experience. As budgets continue to tighten and supervision trips are cut back, having a school garden also provides a medium to continue to offer a quality SAE program and save the school system money.

A garden can offer another chance to inspire students to begin an Agriscience Fair project. Most high school students must complete a science project. Why not team up with the science teacher at your school to increase relevance for the students and expand the STEM dimension of your program?

School gardens also make us think about the possibilities of SAE success in terms of proficiencies at the local, area, state, and national levels. Imagine if a student who began a gardening program working with primary and elementary schools to help educate them about agriculture. Would they not qualify for the Agricultural Education Proficiency Area? What if a student built and sold raised beds and began installing them around the community as turnkey gardens for customers? What if a student learned about composting in agriculture class and began a commercial composting operation? What if a student started a composting initiative for the school district to recycle vegetable, fruit, and paper waste from lunchrooms? What about a student who gains experience working in the garden at school and gets an internship or job at a CSA or vegetable farm? Brainstorm the SAE possibilities that can be natural extensions of a school garden, write them down, and have your students do the same. Share with each other in a classroom discussion and see where the discussion leads.

FFA Opportunities

While there are not National Career Development events for gardening specifically, the relationship of school gardens to FFA is not as far as one may initially think. Is FFA only about career development events? Certainly not! How could a school garden fit into the community aspect of your Program of Activities (POA)? Some programs utilize the garden as an outreach tool and partner with hospitals and nursing homes to occasionally provide fresh vegetables. Other programs work with primary and elementary schools to offer Ag in the Classroom, and utilize the garden as an important component for engaging young students. Programs sometimes construct gardens for primary, elementary, and middle schools as a recruitment tool. A few programs help to provide food for the school cafeterias by participating in the Farm-to-School program.

The agronomy CDE participants could benefit by helping to manage a school garden. A school garden also provides a great place to plant commodity crops to allow students to identify crops at all stages of growth. Be sure to check regulations for crops such as cotton. Furthermore, garden crops offer a great medium to allow students to hone their entomology and pathology skills, increase their knowledge and enhance the overall STEM integration reputation of your program. Agricultural communications, agricultural marketing, food science, and public speaking could have ties to your school garden, as well.

If competition drives you, think about school gardens in that way. How could students compete for prizes? Perhaps the county fair has a fruit and vegetable division. The fair in your area may also have a canning division your students could participate in. Maybe students could compete against one another for *Most Pounds of Production*, *Highest Quality*, *Least Input for Most Yield*, or

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Incorporating Conservation Education in Agricultural Education

by Michael W. Everett and Matt R. Raven

A Case for Conservation Education

Proposed changes to the Elementary and Secondary Education Act (ESEA), specifically in terms of environmental education and stewardship through the No Child Left Inside Act, have important implications in how agriculture, food and natural resource education is viewed especially in states rich with natural resources like Michigan. The question that arises is how should agriculture, food and natural resources education leverage these changes in order to best prepare students for careers in natural resources, environmental stewardship and conservation, especially where they overlap with traditional agricultural production.

Numerous opportunities exist to contribute toward changing the historical paradigm of agricultural education to one of agriculture, food and natural resource education (AFNRE). Traditionally, agricultural education's central focus has been primarily oriented toward production. However, it is imperative to remember that natural resources, through wildlife and land, provided the foundation of this country's agricultural "roots." The philosophical and practical beliefs toward our natural resources by early visionaries led to the conservation education movement from the turn of the century through the 1940s.

The founding fathers of land and wildlife management were adamant about conservation of our natural resources exemplified by movements like the North American Model for Wildlife Conservation. Teddy Roosevelt, John Muir, and Aldo Leopold were raised in a time when traditional agricultural practices, hunting and fishing were not mutually exclusive but rather interdependent to family and community survival.

Today, many AFNR educators subscribe to the philosophical underpinning of community-based programs in which the curriculum is relevant to the local community needs. This is especially important in agriculturally and natural resource diverse states such as Michigan. Michigan is second only to California in terms of agricultural diversity. The southern portion of the Lower Peninsula boasts an incredible array of fruit, vegetable and agronomic crops along with substantial animal agriculture. However, the northern two-thirds of Michigan (the northern Lower Peninsula and the Upper Peninsula) is largely dependent on natural resources-based agriculture and recreational tourism. Recreational tourism is broad in scope with examples including hunting, fishing, snowmobiling, boating and hiking. These examples are important to the economic viability of the state. Consequently, it is important that a more inclusive definition of agricultural education is developed that includes conservation and natural resources education. For example, recreational tourism is an important economic driver. Over 750,000 Michigan hunters take to the field each year with a corresponding impact of over $1.3 billion annually to the economy while generating $153 million in tax revenue (Michigan Department of Natural Resources, 2011, www.michigan.gov/dnr).

Conservation Education in the Classroom

One potential way to quickly incorporate conservation and natural resources education into our agricultural education classrooms is through an adapted version of most states' hunter education curriculum. At one time hunter education was taught in the public high school classroom. However, due to curriculum requirements and the changing needs and wants of our current population, this opportunity to educate youth in conservation of our natural resources became a thing of the past. An adapted version of this curriculum where students learn, think and grow in the area of wildlife knowledge, ecosystem relationships, land management and ethics in the field inherently will help our youth to think and make decisions about the implications of hunting as a tool to conserve our wildlife resources.

An excellent example of how to help students learn a concept related to wildlife management through con-

> Natural resources provided the foundation of agricultural "roots."

servation education is by utilizing a lesson plan related to antler function in white-tailed deer. The function of white-tailed deer antlers is important to understanding genetics and quality of animals within a deer herd. White-tailed deer populate much of the United States (with the exception of the Southwest, Alaska and Hawaii). However, all areas in the country have antlered wildlife, therefore this lesson is applicable nationally.

Antlers are one of the fastest growing bone-like materials in nature. Antlers in Michigan can grow up to one-quarter inch per day between the months of April and August. According to wildlife biologists, antlers serve as a tool to determine the hierarchy among breeding males and females within the herd structure of deer or other *cervids*.

To illustrate the importance of antlers in herd hierarchy, the "Antler Grab Bag" activity can be used. The objective of this activity is to simulate the hierarchy of male white-tailed deer utilizing shed or harvested deer antlers to provide an example where students can compare and contrast the biological characteristics behind a typical white-tailed deer herd.

This activity simulates the experience of a white-tailed deer herd in nature. In a typical square mile section of land (640 acres) during a fall with an ideal climate, the following distribution of deer is found:

- 4 - adult does - > 30 months of age
- 4 - adult fawns (2 bucks/2 does) – 6 months of age
- 4 - yearlings (2 bucks/2 does) – 18 months of age
- 2 - lesser adult bucks – 18 to 30 months of age
- 1 - dominant buck > 30 months of age; and
- Possibly 2 more bucks

For this "Antler Grab Bag" lesson, place the white-tailed deer sheds or harvested sets of antlers in brown paper bags prior to the lesson. Antlers must vary in both size and form. During this activity students will pick a bag with an antler that will represent the genetic and age characteristics of that particular animal.

Each student then finds another student in the class that will represent two antlered males that are "sparring" or exhibiting traits to determine their range and breeding capacity for the herd. Students share with each other why they feel their deer is more dominant than the other. This should include an explanation by each student, which is also a factor in determining student knowledge. Students and/or the instructor can be a direct factor in determining the more dominant animal. The process continues until one animal is determined to be the dominant male deer for the herd.

This activity is also a great way to get students thinking about the world outside. The work of Richard Louv's *Last Child in the Woods* as well as the potential No Child Left Inside Act have created a movement that can complement our current focus on agricultural education as well as provide experiential learning where our natural environment becomes the classroom. When *cervidae* species shed their antlers, this is a great time for students and adults alike to get out into the woods and become more acquainted with the natural world. It is often challenging to find a shed antler and when one is found it makes a lasting impression.

It is important for students to understand that the larger the deer antlers, the more dominant the male deer will be in the overall herd hierarchy. However, it must be also be explained that many other factors may be important for this model to be completely true in nature. For example if the largest male deer has been hit by a car or shot and wounded by a hunter, the animal may not exhibit herd dominance, therefore larger bucks may not be the dominant herd breeding animal. Due to this, lesser adult bucks may become the males that breed females. Additionally, this creates an ideal forum for agricultural educators to introduce genetics of various antlered and non-antlered species. Contact your state natural resources agency or a taxidermist in your local community to assist in making the "Antler Grab Bag" lesson a reality in your classroom.

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Agriscience Practically Teaches Itself *(continued from page 6)*

exemplary record of research. The Star candidates go above and beyond classroom expectations to serve as an example for all FFA members what is possible for them when they apply the science of agriculture.

Agriscience does not have to be an additional item to add to the list of things to do. When implemented across curriculum, agriscience becomes the vehicle of delivery, providing students freedom to explore the vast industry of agriculture and the science behind it; providing us with the flexibility to dive deeper into student interests and really engage them in our subject matter and standards for learning. Once we understand and practice empowering students to ask questions and seek answers, agriscience really does practically teach itself.

Great resources for getting started can be found at:

- http://www.nsta.org/highschoolconnections/201111WhatsInAName.pdf
- http://www.nsta.org/highschool/connections.aspx
- https://www.ffa.org/programs/awards/agrisciencefair/Pages/default.aspx#
- https://www.ffa.org/documents/prof_research_handbook.pdf

References

Partnership for 21st Century Skills. (2008). *21st century skills, education & competitiveness: A resource and policy guide.* Tucson, Arizona: Partnership for 21st Century Skills. Retrieved from http://p21.org/storage/documents/21st_century_skills_education_and_competitiveness_guide.pdf

School Gardens:.... *(continued from page 8)*

Biggest Tomato, etc. You may want to partner with the art instructor for a school wide photography competition with the garden and its produce as the theme. If you have a livestock project auction or steer sale as part of your program, perhaps there could be an auction of the largest pumpkin, best flat of tomatoes, or largest sweet potato. Again, brainstorm about ideas and involve your students in the planning.

Getting Started

School gardens offer many possibilities that can be overwhelming. Along with the ideas generated, many teachers also think about the time requirements for a school garden and often shy away. Time available to allot to a school garden is important to consider. For those teachers who want to start a school garden, don't be discouraged. With proper planning and student buy in, a school garden can be an instructional help, not headache.

There are community members who would lend a helping hand as well as other stakeholders who would help you procure some supplies to get started gardening. Grants are often available from local organizations as well as a few nationwide programs. NAAE Communities of Practice and *www.ffa.org* are great places to start conversations and get answers to questions about gardening. The point is, if you are looking for something to give your program a new perspective, some way to involve your community, add another dimension of relevance to your program, teach students the basics of food production, or all of the above, a school garden is a great way to do it. Spring is coming.

References

Blair, D. (2009). The child in the garden: An evaluative review of the benefits of school gardening. *The Journal of Environmental Education, 40*(2), 15—38. Retrieved from http://www.csupomona.edu/~smemerson/business318/articles101/childrens%20gardens.pdf

Greene, M. L. (1910). *Among school gardens.* Retrieved from http://books.google.com/books?id=KBdFAAAAIAAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

Relevance, Rigor and Authenticity in Ag Education: A Practical Approach to Achieving All Three

by Donald Gilman and Justin Sealy

Facilitating student learning using technology and hands-on experiential learning is the goal of most all agricultural educators. Making the experience meaningful is the ultimate goal in education. Designing curriculum with relevance, rigor and authenticity is even more of a daunting task. For the agricultural educator, finding applications of educational standards is difficult, time consuming and challenging. However, I have discovered a lesson in Wildlife Management that can provide a unique learning experience in these three areas that provide a stimulating educational event to visual, auditory and kinesthetic learners.

The example is a lesson in wildlife identification and habitats specific to certain animals. The educator should arrange the learning experience to center around species native to their areas to better ground the knowledge in the desired curriculum. This lesson provides the student with an opportunity to learn how to evaluate wildlife, their habitat and it provides an excellent pathway to increase the students' understanding of biology, ecological factors and wildlife management practices. As a result, students will be able to use this knowledge to become familiar with wildlife species in their areas as well as become better stewards of the environment with a more profound respect for wildlife management practices. Through investigating this lesson, I have become better at introducing wildlife management and explaining its role in agriscience education as well as sparking students' interest in the Wildlife Management CDE. Elements from this CDE are valuable tools in this lesson and are extremely valuable in attracting and retaining students in agricultural education classes.

To begin the lesson, I enlist the help of our area forestry teacher and utilize his collection of skulls, furs, track imprints and or feathers. This is designed to draw the interest of the student in the topic. The student then progress to utilizing a dichotomous key to identity the animals, thus the visual and kinesthetic learner is able to use this event to better process the information and build on their previous learning experiences.

> This lesson provides a stimulating educational event to visual, auditory and kinesthetic learners.

On the second day of the lesson, our local forestry ranger comes in and is a guest lecturer on forest habitats and how ecosystems impact wildlife production. To build on the student interest in this topic, he usually will bring in several deer racks from white tail bucks harvested in the county to further support his topic. Additionally, he demonstrates to the students deer that will score in either the Pope & Young or the Boone & Crocket record books. Resources for this activity can be accessed by referring to the record club's website. This activity sets up my next day's lesson.

Day three begins with an overview of how to measure deer antlers for documenting and recording deer for the respective record books. For this activity, students are divided into pairs to work together to complete the assignment. Time is allocated for comparing measurements between groups. This allows for students to draw from each other's knowledge which incorporates peer learning and it once again provides hands- on learning activity for greater connectivity with the subject all the while incorporating math by adding and subtracting fractions.

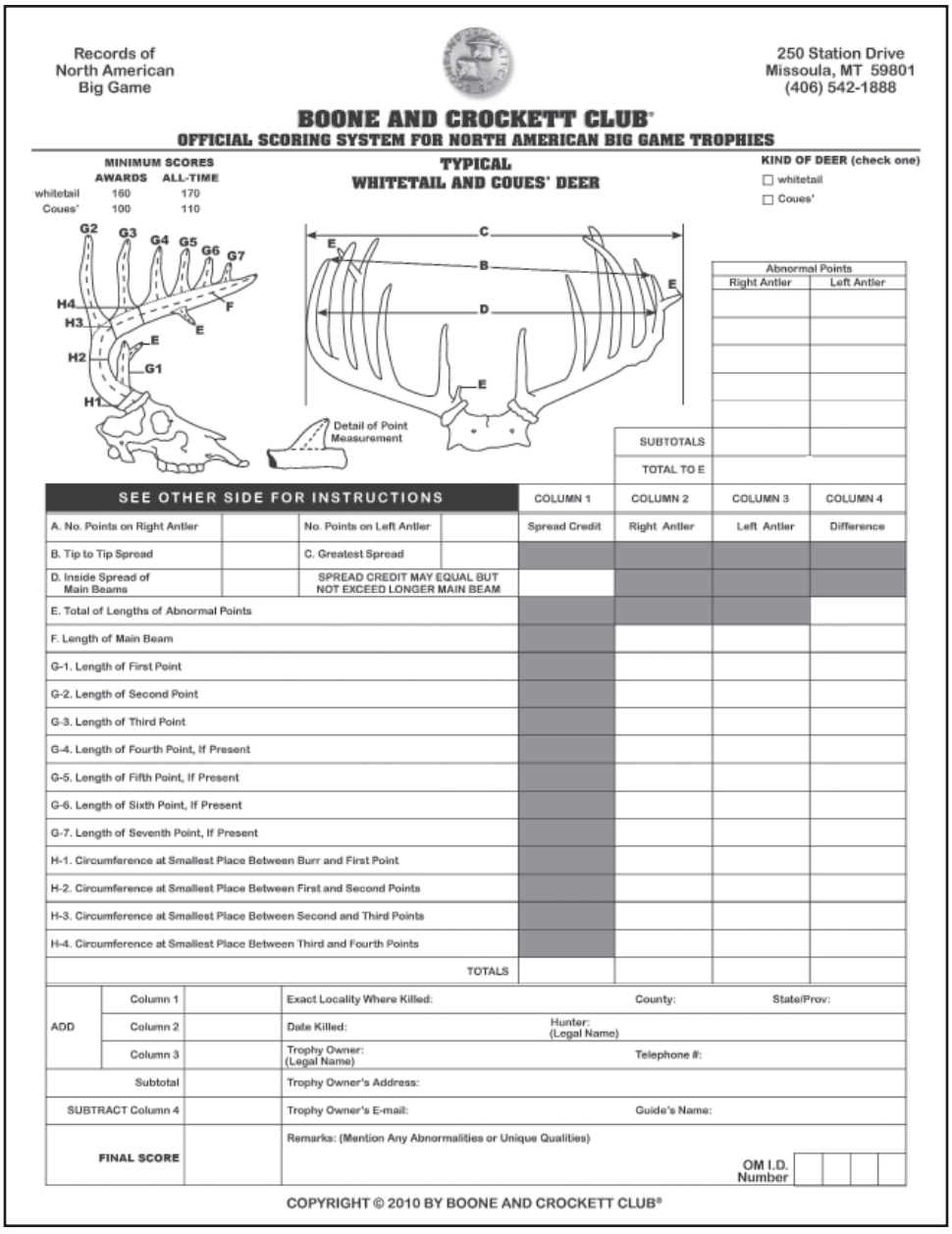
On day four, I assign collaborative groups of students to research a particular animal via Internet resources in the school's computer lab; this task once again compliments peer learning. The groups conduct their research which usually takes the entire fifty-five minutes to complete. Day five is also spent in the computer lab in the peer group setting synthesizing the data gathered to develop a PowerPoint presentation for delivery to their contemporaries; this activity appeals to both the visual and auditory learner. This activity paves the way for day six and seven which is dedicated to student presentations.

This lesson is unique in that it facilitates different learning styles as well as it also incorporates differentiation and technology integration into

the agricultural education classroom as well as the time honored tradition of "hands-on, minds-on" learning. This lesson requires the student to employ critical thinking skills and problem-solving abilities as well as it teaches across the curriculum by incorporating math and biology into the learning process. Additionally, this lesson builds on a fundamental leadership lesson long championed by agricultural education, public speaking which is the culminating activity in this multi day unit.

Utilizing lessons such as this one is another avenue for incorporating Blooms' Taxonomy of higher thinking skills (Overbaugh & Schultz, 2010) into the agricultural education classroom. This type of lesson distinguishes the agricultural education program as an innovation at the local school level in that it facilitates all types of learners and provides a real world experience for the student based on constructivist activities. Additionally, lessons like this one provides students with real-life experiences to investigate agricultural diversity and further solidify the relevance of agricultural education in America's public schools which is a published goal of the *National Agriculture, Food and Natural Resources (AFNR) Career Cluster Content Standards.* According to the AFNR in its organizations purpose, "Strong, relevant agriscience programs are one way we can maintain our nation's agricultural edge" (2009). The lesson is deeply rooted in the Natural Resource Systems career cluster which is becoming more relevant to school administrators interested in preparing students for post-secondary studies at state and technical colleges.

In evaluating this type of lesson, the educator is able to demonstrate to school administrators how agricultural education curriculum has evolved



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Abnormal Points	Right Antler	Left Antler
SUBTOTALS		
TOTAL TO E		

SEE OTHER SIDE FOR INSTRUCTIONS				COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
A. No. Points on Right Antler		No. Points on Left Antler		Spread Credit	Right Antler	Left Antler	Difference
B. Tip to Tip Spread		C. Greatest Spread					
D. Inside Spread of Main Beams		SPREAD CREDIT MAY EQUAL BUT NOT EXCEED LONGER MAIN BEAM					
E. Total of Lengths of Abnormal Points							
F. Length of Main Beam							
G-1. Length of First Point							
G-2. Length of Second Point							
G-3. Length of Third Point							
G-4. Length of Fourth Point, If Present							
G-5. Length of Fifth Point, If Present							
G-6. Length of Sixth Point, If Present							
G-7. Length of Seventh Point, If Present							
H-1. Circumference at Smallest Place Between Burr and First Point							
H-2. Circumference at Smallest Place Between First and Second Points							
H-3. Circumference at Smallest Place Between Second and Third Points							
H-4. Circumference at Smallest Place Between Third and Fourth Points							
TOTALS							

ADD					
Column 1		Exact Locality Where Killed:		County:	State/Prov:
Column 2		Date Killed:	Hunter: (Legal Name)		
Column 3		Trophy Owner: (Legal Name)		Telephone #:	
Subtotal		Trophy Owner's Address:			
SUBTRACT Column 4		Trophy Owner's E-mail:		Guide's Name:	
FINAL SCORE		Remarks: (Mention Any Abnormalities or Unique Qualities)			

OM I.D. Number

Figure 1. Official scoring system for North American big game trophies. (For the full chart go to http://www.boone-crockett.org/pdf/SC_whitetail_typical.pdf.)

to become multifaceted to include technology and a variety of subject matter. Additionally, this type of lesson teaches skills that are measurable and observable which the community, parents, potential employers and post-secondary educators can expect our students to perform once the course of study has been successfully completed. This type of lesson is designed for authentic assessment of standards based curriculum. Upon completion of this lesson, the instructor will be able to evaluate whether or not a student has truly attained and possesses mastery of the skills and abilities defined in the standard. What validates the assessments as authentic is that the assessment must closely emulate the actual skill defined in the standard. For example, this lesson is centered on Georgia Agricultural Education Curriculum standard:

AG-WL-4. Wildlife Biology: Students will describe the habitat needs of selected wildlife species native to Georgia, identify wildlife species of Georgia from physical characteristics and/or evidence, identify the role of selected species in their environment, and explain biological processes related to reproduction and survival of selected species. (Georgia Department of Education, 2010)

Upon examination, the instructor will be able to compare student generated work with the standard based on a rubric provided to the student to assess the level of learning that has taken place. The standard lends itself to authentic assessment and rigor which is needed to distinguish our programs for greater relevancy in our educational programs on local, state and national platforms. The structure of this lesson is one that differentiates learning styles and is adaptable to other topics of agricultural education curriculum. Utilizing this type of lesson to generate and maintain student interest in the topic introduced helps the educator to engage his or her student in the individual Ag Ed programs that are tailored to the needs of the communities they serve.

Finally, a fact that should not be overlooked is that students enjoy this lesson that incorporates various activities. Feedback gathered from students after completion of this activity view it as a fun approach which can drive a student's interest to further explore a given area. As educators, we should examine and employ activities that motivate students to learn and explore topics that have relevance, rigor and authenticity for agriscience curriculum.

References

National Agriculture, Food and Natural Resources (AFNR) Career Cluster Content Standards. (2009). Retrieved November 25, 2011, from National Council for Agricultural Education: http://www.teamaged.org/council/images/stories/pdf/finalafnrstandardsv324609withisbn_000.pdf

Boone & Crockett Club. (2011). *Download B&C Score Charts*. Retrieved from Boone & Crockett Club: http://www.boone-crockett.org/pdf/SC_whitetail_typical.pdf

Georgia Department of Education. (2010). *GPS Standards for Wildlife Management*. Retrieved November 25, 2011, from Georgia Agriculture Education Curriculum: http://www.gaaged.org/GPS/Forestry-Natural%20Resource%20Pathway/Courses.html

Overbaugh, R. C., & Schultz, L. (2010). *Bloom's Taxonomy*. Retrieved November 24, 2011, from Old Dominion University: http://www.odu.edu/educ/roverbau/Bloom/blooms_taxonomy.htm

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Incorporating Conservation Education .... ***(continued from page 10)***

Summary

Natural resources lessons using conservation education techniques can complement AFNRE and serve as a foundation for incorporating the No Child Left Inside Act by providing a context for learning that is far reaching to students of both urban and rural settings. *Cervid* species are found in all reaches of the United States and provide an excellent resource for teaching and learning. Currently, AFNR Education provides a solid foundation for teaching and learning of agricultural practices along with the direct application through Supervised Agricultural Experience (SAE), leadership qualities and through FFA. Implementation of conservation education lessons will enhance learning for a broader audience student's in our schools while decreasing the potential for "nature-deficit disorder" as suggested by Richard Louv and meet the needs outlined by the No Child Left Inside Act.

Creating a Fun Game (Feast or Famine) to Help Students Learn about the Importance of Seed Identification Related to World Food Crops

by Lori Unruh Snyder, Sarah Cathey, and Kenneth Quesenberry

Individuals with non-agricultural backgrounds comprise the majority of students interested in biology today. Most of these students are unaware that a relatively small group of plant species produce most of the world's food supply. One approach to creating interest in a new subject is through the use of games. Games have been examined in university classrooms since the 1950s (Gros, 2007). Moreover, game-based education has been utilized as an instructional tool across disciplines ranging from international relations (Magney, 1990) to biology (Randel et al., 1992). Not only do game-based exercises offer the potential for students to learn new material, but they also serve to reinforce the student's understanding of previously-introduced content (Magney, 1990). The cognitive benefits for the student include peaked interest in the subject matter, creating a novel mechanism of learning within the context of critical thinking, and promoting student retention of the content (Jacobs & Dempsey, 1993).

The purpose of creating the Internet-based learning system CROPVIEW (http://www.purdue.edu/cropview/) was to complement traditional crop science classes by promoting student awareness of global food issues and to provide an interactive platform to reinforce crop adaptation concepts. The website consists of four learning modules followed by a game module. The four learning modules are "Introductory Module" - overview of major groups of plants, plant nutrition, photosynthesis, and biome adaptation; "Nutrition Module" - how plants provide energy and protein for human nutritional needs; " Biome Module" - characteristics that distinguish biomes and determine their global location; and "Seed Plant Module" - descriptive information and interactive images of 20 of the world's most important crops. The "Feast or Famine" game module evaluates identification and adaptation of the primary plants that feed our world. The game consists of three scenarios of increasing difficulty in which populations are faced with natural disasters that could lead to famine. The game player is challenged with the mission to supply seeds to the disaster-stricken region that are adapted to the corresponding biome and that will satisfy human nutritional needs.

> A small group of plant species produce most of the world's food.

As the students progressed through the three levels of the game, he or she was presented with a natural disaster occurring within a region that was progressively more limited in the number of well-adapted crops available. The game begins with a disaster location in the United States of America, and then moves on to India and Sub-Saharan Africa. Therefore, achieving a successful score from crop selections became more challenging. Students must also hone their seed identification skills to progress through the game. For level one, the common name was given along with each seed, but for level two, only the scientific name was given. In level three, the seeds were unlabeled, requiring the student to identify each of the seeds by sight alone. All of the information about seed identification and crop adaptation had been presented previously in the learning modules.

The game environment for Feast or Famine consists of an office environment with an electronic touch-screen device on one side of a v-shaped desk, and a world map on the other. The student is presented within this environment with a disaster file and subsequent mission. The player reviews the file, which consists of an article and natural disaster footage, and then he or she must take properly-adapted seeds to farmers in the specified region so that they can plant crops that will feed the affected population. Students must keep in mind the concept of amino acid (protein) balance for proper human nutrition as well as adaptation. The student then selects three seeds from a drawer near the map to be planted in the region by dragging and dropping the seed onto the map. The student may also consult experts in related fields such as agronomy, climatology, medicine, or anthropology, all accessible through

the electronic device on the first desk, before making a decision.

The Feast or Famine game was created using Adobe Flash. The data for both the information presented for each seed and the scoring draws from a database that includes the scientific names and common names of each crop as well as a compatibility rating for each crop x biome combination in the matrix. The compatibility ratings were based on a scale from 1 to 5, with 5 being most adapted to a given biome and 1 being unsuitable for that environment. Basic nutrition data for each crop, i.e., carbohydrate, protein, and fat content, was also included in the database expressed on a gram per 100 gram basis. Success or failure, i.e., "feast" or "famine," was determined mathematically based on the sum of the crop x biome compatibility score, with a sum of 7 or better required to avoid famine.

Since creating the game, we have surveyed several first-year college students who have responded positively to the game-based test of seed identification and crop adaptation knowledge presented by Feast or Famine. Student responses include "*enjoyed the challenge of applied learning of seed crop adaption*" and "*felt that it was a useful way to learn about where different plants grow best, while learning to help people not go hungry.*" Students appreciated the opportunity to gain information from experts they felt would help their outcome in a given biome. Depending on the students' prior knowledge and awareness of famine issues and nutritional demands, this game either reinforced their perceived need to learn more about such issues or created a desire to learn more about real-world food production issues.

CROPVIEW is currently incorporated into curricula at three land grant universities and is available to be utilized by other universities as a distance learning tool for agricultural education. The Feast or Famine game is a fun way to give students a reason to review their knowledge and to spark further interest in issues pertaining to world food production. Issues to consider when creating an on-line gaming tool are the importance of developing an assessment that addresses many cognitive learning styles and that clearly addresses the learning objectives of the overall teaching unit. Results from the survey of students who used Feast or Famine indicate significant positive change in students' ability to recognize seeds and plants that feed our world as a result of gameplay. This program successfully challenged students to think critically about plant science in light of current challenges facing global food production. In the future, the game could be expanded by introducing additional disaster scenarios or by incorporating challenges related to changes in crop adaptation related to projected future climate-changed conditions.

References

Ebner, M., & Holzinger, A. (2007). Successful implementation of user-centered game based learning in higher education: An example from civil engineering. *Computers & Education, 49,* 873-890.

Gros, B. (2007). Digital games in education: The design of game-based learning environments. *Journal of Research on Technology in Education, 40(1),* 23-38.

Jacobs, J. W., & Dempsey, J. V. (1993). Simulation and gaming: Fidelity, feedback, and motivation. In J. V. Dempsey & G. C. Sales (Eds.), *Interactive instruction and feedback* (pp. 197-227). Englewood Hills, NJ: Educational Technology Publications.

Magney, J. (1990, January). Game-based teaching. *Education Digest,* 55(5), 54-57.

Randel, J.M., Morris B.A., Wetzel C. D., & Whitehill B.V. (1992). The Effectiveness of Games for Educational Purposes: A Review of Recent Research *Simulation & Gaming September v. 23: 261-276.*

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Baby Boomer Turned Digital Native: One Teacher's Journey into 21st Century Learning

by Byron Ernest

Educational spaces need to be smart, technology rich, adaptable, and configurable in order to meet the needs of today's students. If the desire is to put students first, it has to be more than just unloading crates of technology into a room for the teacher and saying, "Have at it!" At the same time educators must provide inspirational learning spaces on a limited budget. Technology is everywhere in today's educational environment. This technology is important not only for engaging instruction, but also for creating a collaborative environment with other educators both inter-school and intra-school. This well planned environment allows the teacher to individualize both manner of instruction and type of technology appropriate to the student. Solutions that address these needs are imperative to give educators the tools and facilities they need to assist learning, and students the tools necessary for engaging learning. When all these needs are met classrooms become collaborative student learning places.

Let the Journey Begin

As an agriculture educator who never used a computer (because they were not available) for his undergraduate and Master's studies, or first two years of teaching for that matter, it seems an odd fit to be what I call a "digital adoptee" in my high school. Even though many the same age and older in my profession are apprehensive of technology, I have always been a believer in what it can do for the student. Experience has also taught me how important the physical layout of the room and furniture is to the educational experience. I recently had a graduate student visit me for a day, and she said, "Coming to your class is an event!" It is an event because students love coming to class and immersing themselves in the educational process through collaborative learning and use of technology.

When I started the agriculture science program at Lebanon Community School Corporation eight years ago the goal was to give our students the technology and environment they deserve for maximum learning. The environment, not the technology is what is most important. I was able to provide our students with one-to-one classroom wireless laptop capability, but I also knew that the old five by six (five student desks in a column by six student desks in a row) model would not fit my pedagogy either. The ultimate goal must be that instruction and student learning drives the design, and that the classroom inspires learning (Demski, 2009). Therefore, we kept this in mind when designing our model-learning lab, which I call the SWELL (SMART Worldwide Effective Learning Lab) classroom. In my room it is tables with rollers and swivel chairs on rollers that give the students the flexibility to configure and reconfigure multiple times during our 87-minute block classes. Tables with four students each allow the teacher to pull up a chair and give assistance, monitor learning, and differentiate activities. This configuration also allows for readily forming important relationships with the students. Dr. James Comer said, "No significant learning occurs without a significant relationship" (Payne, 2005, p. 9). When designing learning places we must remember that positive relationships between students and their teachers are crucial to learning.

Designing SWELL

Because of SMART Technology's generous donation of SMART Board technology to me as the 2010 Indiana Teacher of the Year (SMART donates these packages to all State Teachers of the Year each year), my school decided to use my room as a model for designing a learning lab and for action research (Stringer, 2007) to help guide technology decisions for our school corporation. The decision was made to gut the room, which was formerly a science room, and start from scratch. The goal was to design an environment where students use the technology to carry out collaborative lessons not being taught by me, but being facilitated by me for student managed learning. What George Wood called, "Learning to learn" (Wood, 2005). The vision was to have an interactive agriculture science classroom equipped with SMART Board technology.

> Students love immersing themselves in the educational process.

In order to investigate about the learning lab environment we formed a team and made many site visits. The visit that most intrigued the team was to Purdue University's Krannert School of Management and Economics Library Interactive Learning Lab (Bush, 2009). Our team really liked the triangulated interactive boards, positioned to be visible from any angle in the room. This truly made the lab engaging, as there was no front or back of the room. Another component that really fit my pedagogy was the Steelcase Huddleboard. These 32" X 42" portable white boards enabled collaborative group work. The instructor said, "Huddle-up and discuss…" The groups then discussed their topic and wrote their thoughts and diagrams on the Huddleboards. After all groups had presented, the boards were placed on a rail and the Steelcase CopyCam took a picture which was sent to all the students via a website. The CopyCam also allowed pictures of the Huddleboards to be downloaded directly to a USB flashdrive or sent directly to a printer. Students were able to listen and be engaged in the discussion as opposed to taking dubious notes. The Huddleboards and CopyCam were a must for the SWELL Classroom.

Enhancing the Student Learning Experience with Technology

It cannot be stressed enough that the digital revolution is not about the teacher using technology, but enabling the student through their use of technology. Even though this author's school district grapples with the same issues of funding and policies, we are still moving forward to put in place the technology that provides our students the digital content and open resources they need and deserve. Indiana has changed the definition of textbooks to include electronic materials (Fletcher, 2010). Digital resources can now be used to provide for curriculum enhancement (Fletcher, 2010).

In my SWELL classroom we are using Apple iPod Touches to provide reading resources. I am able to push books out to the entire classroom set of iPods at one time. This is a great tool for doing book readings utilizing Socratic seminars. Students are also using the iPods to record data from labs. When left to the students, they find appropriate apps that help them engage in the learning process. Students are allowed to download apps and then at the end of each week all apps not downloaded by me and pushed to all iPods are wiped off. Through our action research the iPod has been identified as a great way for students to access information quickly. Additionally, each class has developed an iTunes song list to play during work time. We are now in the process of testing a set of Apple iPads. The apps that are coming out for the iPad are very innovative and useful to students.

Now with the SPARKvue app, students in my Advanced Life Science courses are doing real-time measurement, data visualization, and analysis. Students can use the new PASPORT AirLink 2 Bluetooth interface to connect to over 70 PASCO sensors, measuring a wide range of phenomena, including pH, temperature, force, and carbon dioxide levels. SPARKvue is designed for scientific inquiry in biology, chemistry, earth science, environmental science, physics, and physical science. SPARKvue can record data from the iPhone, iPod Touch, and iPad.

By going to a Mac platform our students have been able to use FlipVideo to make movies using Apple iMovie. Students this past year were able to report real-time research done in conjunction with a partnership formed with AgReliant Genetics. This research was reported with the use of movies and wiki sites (a Web site where anyone can edit anything anytime they want). Wikis make perfect sense in this environment because the students work collaboratively, can edit each other's work, and pages are easily added (Richardson, 2010). Additionally, the wiki can be shared with any audience, as in this case, researchers at AgReliant Genetics (Richardson, 2010). The key to using this technology is that the students are doing all of the work. Although formal written reports are useful in some contexts, these new and innovative uses of narrative texts, staged performances, and electronic productions made by the students enhance the learning even further (Stringer, 2007). They take great ownership in the process and have the desire to do outstanding work. Using technology in this manner pushes the students to do a greater share of the thinking (Lemov, 2010).

With SMART Response I am able to pretest, practice, and have useful reflection. Each student has his or her own response tool. This allows for quick, formative feedback (assessment for learning) and allows the students to remain anonymous. All of these tools are really about increasing student engagement.

A Typical Day in the SWELL Classroom

It is first period and time for Advanced Life Science – Plant and Soils. This is a dual credit course with Purdue University's Botany 210. Students are met in the hallway with a handshake and then proceed to pick-up their Macbook and log-on to their wiki site where they find a link I have put on for their daily current event reading. This current event reading could have also been shared electronically with the students' emails using

the USA Today app on their iPods. Today's article deals with resistant weeds due to chemicals developed through biotechnology. Students then journal the main points of the article onto their wiki site and do a summary paragraph relating the article to class work presently being done. Then students pick up their iPod Touches and proceed to the greenhouse to collect data on the 240 corn plants being grown to do actual Bacillus Thuringiensis bacterium (Bt) research for AgReliant Genetics. Data on rootworm damage is collected using the iPods. Students then return to the classroom and upload the data to their computers. Students are then asked to produce presentations on either Huddleboards or SMART Boards related to the following topics of economic impact of Bt corn, environmental impact of Bt, genetic markers, or corn rootworm lifecycle. Students then present, and the presentations are uploaded to their group's wiki site.

Professional Development for Digital Learning is a TALL Order

Dialogue that always occurs when discussing the proper use of technology and the 21st Century learner is that of how should schools provide the professional growth necessary for teachers to provide a rich digital learning environment? One of the major factors at play is the vast array of differences in where staff members are on the digital/technology learning curve. A one-size fit all system of professional development will not work where technology is involved (or any other educational subject for that matter). Lebanon High School has developed a process that has proven very valuable to meet this need. In order to eliminate the traditional "one-shot" professional development time where information is thrown out to teachers and hopefully some of the material is caught, our school implemented TALL (Tiger Academy of Lessons Learned).

TALL was started in the spring of 2009. This process was a product of the studies of Garvin (2000) in the area of the learning organization. TALL is modeled after the U.S. Army's Center for Army Lessons Learned (CALL). It is a process with no hierarchy that has teachers working in groups of like interest and knowledge to learn new techniques, study research, try new practices/technology, and book readings. Groups meet formally every week during time set aside in the morning, and have a reporting form on our shared network file that is used to report to the entire staff along with having Ning (internet social network) forums and we are now using our state's new Learning Connection Network (Indiana Department of Education, 2009). Many groups meet outside the normal school day to work. Groups can start up and dissolve as necessary.

This strategy enables teachers to use the group genius created to improve teaching skills and gain best practices from each other thus improving student achievement. These self-directed professional development (Mohr, et al., 2004) groups provide for teacher-researcher-based discourse about teaching and learning (Weinbaum, et al., 2004). TALL teacher inquiry groups allow for both knowledge production and sharing (Weinbaum, et al., 2004).

As of the writing of this article, Lebanon High School has TALL groups specifically relating to technology including, basic computer usage, Smart-board use, Web 2.0, and teacher blogs/websites. When it comes to technology, many of our more seasoned teachers who were having difficulty moving toward a more digital environment say that TALL has given them the confidence and skills to match the technology with their pedagogy.

A SWELL Vision for Providing Innovative Technology Solutions

Through the SWELL Classroom and other duplications throughout the school, the Lebanon High School Agriculture Department is a leader in providing innovative networking and information technology solutions to student learning. By proceeding in stages, Lebanon will be able to develop staff, so first round teachers will be able to provide support and training, and share lessons (Fishtrom, 2009). The SWELL Classroom allows for designing each lesson to meet the individual student's needs, and then deliver that lesson in such a way that is effective for that particular child (American School Board Journal, 2009).

Students are always found coming to class enthusiastic and ready to connect to a global society brought together through technology. The plans are to add remote and self-guided learning through technology to further differentiate learning and offer an even wider range of classes. With SMART technology it will even be possible to do distance learning with other schools. The SWELL Classroom vision embraces the idea that one-size-fits-all schools do not work for all students. Because the same teaching techniques do not work equally for every student, SWELL Classroom technology can be matched with the appropriate pedagogy to meet the educational needs of all students.

References

Bush, J. (2009). Purdue libraries celebrate new interactive classroom, start second of three-phase renovation. *University News Service.* Retrieved on Septem-

ber 3, 2010 from: http://www.purdue.edu/newsroom/general/2009/story-print-deploy-layout_1_1573_1573.html.

Demski, J. (2009). Space craft: Innovative architecture is bringing form to the function of 21st- century learning. *The Journal, 36*(7), 34-38.

Fishtrom, R. (2009). Best in tech 2009. *Scholastic Administrator, 9*(3).

Flether, G. H. (2010). A revolution on hold. *The Journal, 37*(6), 21-23.

Garvin, D. A. (2000). *Learning in action: A guide to putting the learning organization to work.* Boston, MA: Harvard Business School Press.

Indiana Department of Education (2009). Retrieved on August 13, 2010 from: http.//learningconnection.doe.gov.

Lemov, D. (2010). *Teach like a champion: 49 techniques that put students on the path to college.* San Francisco, CA: Jossey-Bass.

Murphy, C. U., & Lick, D. W. (2005). *Whole-faculty study groups: Creating professional learning communities that target student learning* (3rd ed.). Thousand Oaks, CA: CorwinPress.

Moore, M. M., Rogers, C., Sanford, B., Nocerino, M. A., MacLean, M. S., & Clawson, S. (2004). *Teacher research for better schools.* New York, NY: Teachers College Press.

Payne, R. K. (2005). *A framework for understanding poverty*. Highlands, TX: aha! Process, Inc.

Richardson, W. (2010). *Blogs, wikis, podcasts, and other powerful web tools for classrooms.* Thousand Oaks, CA: Corwin.

Stringer, E. T. (2007). *Action research* (3rd ed.). Thousand Oaks, CA: Sage Publications, Inc.

Weinbaum, A., Allen, D., Blythe, T., Simon, K., Seidel, S., & Rubin, C. (2004). *Teaching as inquiry: Asking hard questions to improve practice and student achievement.* New York, NY: Teachers College Press.

Wood, G. H. (2005). *Time to learn: How to create high schools that serve all students*. Portsmouth, NH: Heinemann.

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Potpourri: .... ***(continued from page 4)***

ney into 21st Century Learning explores ways to build collaborative learning environments while exploring the teacher's digital journey into 21st Century Learning. *Creating a Fun Game (Feast of Famine) to Help Students to Learn about the Importance of Seed Identification Related to World Food Crops* helps to narrow the "digital divide," as it seeks to inform teachers about using interactive games to help students learn.

The article *Funding Agricultural Education the Buck Stops Here* reminds us of the continued need for funding ideas and suggests ways to be successful in your fundraising activities. Our perceptions are not always the same, even though we may be looking at or involved in the same thing. Take for example the many optical illusion pictures that I use in my class to illustrate the fact that although we are looking at the same picture, part of the class will see one item and not the other while some see both and yet others see nothing special in the picture. *Do You Perceive My Perception* challenges us all to think about how we perceive the role and impacts of middle school agricultural education programs. Middle school programs can be critical in building and sustaining high school programs particularly in rural areas. This article relates how middle school programs can be just as dynamic as high school programs, clearly depends on your perspective.

As educators, we have all learned about learning styles and ways to teach that promote learning for all. How many of you still use the Be-Quiet-Listen-Take-Notes (BQLTN) approach to teaching? The article *Brain-based Learning: BQLTN vs CASE* challenges educators to move beyond BQLTN to use brain friendly teaching and learning techniques to take agricultural education to a new level.

Agricultural education is truly a miscellaneous collection of subject matter, teaching methods, youth development and fundraising activities. We hope this potpourri of articles starts your new year looking at agricultural education opportunities through a new lens.

Funding Agricultural Education, the Buck Stops Here!

by Michael Slice

No! Every administrator's favorite word

As an agricultural educator, have you ever derived an incredible idea for your class that your administrators "shot-down" simply because of the lack of funding? This is a horror story that I see playing out time after time in this profession. Funding was voted the top categorical dilemma that agricultural educators must deal with (Conners, 1998). Every year more states' agricultural education programs are reporting that they are suffering from a reduction in both state and federal funding (Rossetti & McCaslin, 1994).

Who needs fund raisers? I do!

Operating an agricultural education program on the secondary education level is expensive! There are many extracurricular costs that the program incurs throughout a normal school year that must be paid for. Personally, I enjoy going on field trips and developing new life experiences; one could say that I look forward to school field trips more than my students do and this would be an accurate assessment. Knowing this, can you imagine how distraught I would be if I was ever rejected for any of my class field trips? This is a question that agricultural educators must deal with on a daily basis. It takes skill to generate enough funding to send FFA students to all the Career Development Events (CDE's), conventions, and conferences that each local chapter must participate in each year. Travel costs for Georgia high schools are a significant portion of the funds that are spent by FFA chapters each year. A hotel room sleeping a maximum of four students for one night costs about $100 for conferences and conventions, bus driver pay and fuel cost will start around $125, and meal costs will be at least $50 for a group of four. Most FFA chapters attend at least four CDE events, a convention, and one conference costing a minimum total of $1250 per year. After that, I still have to purchase FFA formal wear for the meetings and promote FFA cookouts to entice other students to join the organization. On average, I collect three dollars that is applied to my local FFA chapter and I spend about $55 per student each year to supply the chapter. Fund raising has become one of the most critical components of the job.

> Funding was voted the top categorical dilemma that agricultural educators must face.

So how do we generate money?

Many agriculture educators have scratched their heads and pondered the notion of making money for hours at a time. The simple answer is that there are many ways to generate funding for a program. The trick is to find something that generates significant amounts of cash flow quickly and is entertaining for the students. For many agricultural educators, fund raising is a trick that we keep up our sleeves and use when the timing is perfect. Here are some ideas that have benefited other FFA Chapters.

1. Organize a fruit sale a month before Thanksgiving to take advantage of people making fruit baskets for the turkey feasts.
2. Organize a candle sale several weeks before the Christmas holiday break so people can buy them as gifts without having to fight the crowds at retail stores.
3. Most agricultural education programs have to purchase seeds, seedlings, or some kind of cutting to teach students about propagation methods in class. These plants can be sold at the end of the school year to fund a FFA chapter the following year. Many schools have found ways of marrying agricultural education activities to FFA fund raising (Fry & Spangler, 2009).
4. FFA funds can be invested by purchasing either fern or poinsettia plugs and selling these same plants later in the year at higher costs when these plants are in demand.
5. Set up booths and sell 50/50 raffle tickets at home football games and pay the winner that night. Many times the winner will donate a portion of the winnings to the chapter to accompany the 50% that it has already accepted.

6. Ask for donations from local retailers and have a silent auction during the chapter banquet. Donations have zero costs and 100% profit!

All successful fund raisers have characteristics in common but none is more important than getting the word out. People cannot support a fund raiser if they are not aware that there in one going on. Social networking is critical to the financial success of any organization especially non-profit ones (Flandez, 2010). Modern technological advancements have made it easier for people to get the word out about anything. Social networking sites such as Twitter, Facebook and YouTube have developed cult like followers that can spread the word about an event at viral speed. These networking sites can be a great asset to spreading the word about your fund raisers but use the social networks with caution. When communicating with your local community, it is imperative that their personality types are pinpointed and you communicate with them in a style that works best for them (Gardyn, 2004). A whole fund raiser can be completely destroyed by the FFA chapter not coming across as sincere to all the personality types.

Reaching for the "gold" without stepping on toes!

Try to avoid conflicts at all costs because it can really damage the chapter's credibility among other colleagues. It is awkward when two clubs are selling similar products at the same time. Also, others may become disgruntled with you if they think that you have high jacked their fund raising idea even if your fund raiser is scheduled at a different time in the year. Always find out about other fund raising groups and ask for permission if your chapter's fund raiser is remotely similar. This is a concept where the proverb "An ounce of prevention is worth a pound of cure" seems to fit the situation perfectly.

Why beat your head against a wall?

Many agricultural educators have asked themselves this question year after year. For different and sometimes unknown reasons, fund raisers may perform significantly poorer from one year to the next. The funny part is that we may know that it will be the case before starting that particular fund raiser. A fruit sale that was great the previous year may be far from stellar the next year but there are dedicated customers to that fruit sale who buy year after year. These people may become dependent upon that fruit sale and expect it when that time of the year rolls around. It is better to go forward with the fruit sale and break even on the profit than it is to incur the wrath of those disgruntled customers who can really drive the fruit sale the following year and make it a tremendous success again. Taking the lumps for one year will be worth it for the long-term success of the program.

Seeing the Light!

Congratulations, the light at the end of the tunnel is not a train but success! This is the emotional relief that many of educators feel after completing a positive fund raising event. It is a euphoric feeling when you can report to your students that they have enough funds to participate in the next field trip. As an advisor to such a successful group of students, we all feel accomplished along with a since of belonging and affiliations with other agricultural educators. After this, there is only one question that you will ask yourself; are you ready to start all over again with the next fund raising event?

References

Conners, J. J. (1998). A Regional Delphi Study of the perceptions of NVATA, NASAE, and AAAE members on critical issues facing secondary agricultural education programs. *Journal of Agricultural Education,* 39(1), 37-47. doi:10.5032/j.1998.01037.

Fry, V. & Spangler, G. (2009). $4. *The Agricultural Education Magazine, 82(3), 7-8.*

Rossetti, R . & McCaslin, N. L. (1994). A status report on middle grade agricultural education and FFA programs in the United States. *Journal of Agricultural Education, 35(2), 22-26.*

Flandez, R. (2010). Charities Look to New Social-Network Managers to Bolster Fund-Raising Efforts. *Chronicle of Philanthropy*, 23(3), 14. Retrieved from EBSCO*host*.

Gardyn, R. (2004). How a Fund-Raising Consultant Found Her Calling. *Chronicle of Philanthropy*, 16(11), 31. Retrieved from EBSCO*host*.

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Do You Perceive My Perception?

by Jessica M. Jones

How often do we perceive the same matters as someone else unless we have first attained the knowledge to arrive at their conclusion? Often enough we agree with others, acknowledging we see various factors the same way, but seeing factors versus perceiving them are not the same. To see is to perceive by the eye, but perception takes into account multiple variables, including inner self.

Merriam-Webster defines perception as several entities with one linking to the root word *perceive.* Perceive is characterized for one "to attain awareness or understanding of" (2011).The question I pose, do you perceive my perception? The thought process for me concerning perception heightened during a discussion with a comrade. An individual who is regarded as an agricultural enthusiast stated "I wouldn't do what you do, I would be too bored." Well I, Jessica M. Jones, am an agricultural educator who teaches middle school by choice. From my perspective, a statement about boredom shouldn't insight my thinking but it did, due in part because the words spoken came from a high school colleague who teaches agricultural education. Beyond shock, I could not comprehend what would cause this person to connect ennui to a shared career. We are both qualified to instruct the same curriculum only we do it at different levels. Yet, this person would not do what I do, even though we do the same thing.

Conversing with other agricultural educators in an attempt to seek an understanding for the premise of boredom, increasingly I found more agricultural educators of middle school students experienced the same misconception about the profession as I had. Middle school educators had at some point been given the impression instruction delivered at the middle grades was not as important or beneficial to that what would be attained at the high school level. Delving into this affair, it became certain that perception about our importance at different educational levels within our profession is problematic and needs to be addressed.

Agricultural educators all face the same challenges including but not limited to classroom/laboratory instruction, student driven supervised agricultural experiences, and the FFA program. Furthermore, our main challenge is reaching our students. There is no one technique to motivate students to engage in their own learning, but the vessel of our pedagogy ministers to the situation well. It is our task as educators to reach our students daily, and what a better way through hands-on, real world applications bestowed through our profession.

> Agricultural educators reach their students daily through hands-on, real world applications.

Take for example student career development events. The purpose of CDEs is to aid students in developing critical thinking, effective communication, and performance ability skills. Two of my students competed in their first public speaking experience at the junior division Virginia FFA Agriscience Demonstration career development event. One student straddled the fence on people's perception of his speaking ability, while the other enjoyed speaking to crowds, but only crowds he knew relatively well. Maslow's Hierarchy of Needs is proof agricultural education is not an inequality for which is better, middle or high school agriculture. We all have had students who have either straddled the fence or were apprehensive about their environment more so themselves. As educators we are obligated to seek ways to encourage our students to step outside their comfort zone and become better individuals.

Those two students conquered their fears as they were announced the state winners defeating fellow middle school and high school competitors. The fact is all of our students are from different backgrounds physically, mentally, and socially. It is through our practical methodology that allows the students to find an interest that sparks their premier leadership, personal growth, and career success.

As the students above learned how to develop their sense of leadership and grow within themselves as people, other students aspire to establish career goals through early planning stages. Several of my students had expressed an interest in forestry and natural resource management as a career. I encouraged them to join my forestry team and see if that was the path they wanted to truly pur-

sue. This past fall that set of middle school students swept the federation and area teams in the Virginia FFA Forestry Judging career development event. Needless to say, some of the high school students and advisors had shock on their face as a team of middle school students proved proficient at a competition that has been deemed challenging and rigorous for its high school participants. These same middle school students will compete in the state Forestry competition in the latter spring and have already begun preparing for battle by taking the initiative to study independently at home with their parents and other family members. These students have identified an interest that has sparked them to advance in greater achievement for a lifelong journey.

As depicted in Abraham Maslow's book *Motivation and Personality* (1954), after a need is satisfied it stops acting as a motivator and the next need one rank higher starts to motivate. It is essential for students to flow as smoothly through this pyramid at their own pace. If the transition is too rapid or initiated abruptly, the result can be needs not being met and the pyramid collapsing. The direct effect yields stagnant or underutilized performances in the classroom, at-home projects, and endeavors sought in FFA. If done correctly, it enhances the students' desire to pursue a specific objective which gives them satisfaction while gaining higher knowledge and accolades than what the average individual claim they can earn.

It is imperative that as middle school educators we cultivate a sense of belonging as we are the first exposure to the profession of the agricultural education model. The experiences incurred at the middle school level set the bedrock for a student's perceptions and aspirations for agricultural education and the high school program. Additionally, it is just as imperative to increase the rigor for students in high school programs. The reasoning, once students have achieved a sense of belonging they are ready to intensify and maximize their learning potential, thus working toward satisfying the self-actualization need.

> We are agricultural educators by choice not chance.

Proof of satisfying the self-actualization need came from student achievement during the 2008 school year. Students of my chapter were named the first place national winners for the National FFA Week contest. Throughout the week, members participated in an Adopt-A-Highway program, visited a nursing home, talked with elementary students about food and agriculture, and produced their own commercial spot which aired on television at our school. The best part was being able to report 100% of FFA chapter members participating in the week's activities. "CASE IH is so proud to support the creative planning and hard work that members put into their FFA Week events," said Julie Rudnick, Manager of Marketing Communications for CASE IH. "They deservedly put themselves in the spotlight each February, both on a local and national level."

These students recognize their abilities to motivate and achieve for themselves and understand they have a higher calling to do the same for others. Since 2008, students have maximized their potential and expanded their area of impact by incorporating more outreach, environment, service, fellowship and gratitude activities in the chapter, school and community. This ingenuity has led to the chapter being recognized as a state gold Superior Chapter of the Virginia FFA Association and a nationally recognized three-star chapter in the FFA National Chapter Award Program.

The vocation of agricultural education accelerates students to excel above and beyond minimum expectations. Student needs drive the middle and high school education programs to be equal. It is the requirement of diverse approaches at varying times in the educational system that leads us to student achievement and our own career success. Our profession is not a name game. Being a former high school teacher and a current middle school teacher, more so as an agricultural educator, if I were to erase the word "middle" from my school and chapter and simply present student achievement on paper, would you be able to distinguish if the work was accomplished by students between the ages of 10 to 15. If not, then we should all understand we are all agricultural educators by choice not chance with no distinction made and no room for boredom.

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Brain-based Learning: BQLTN vs. CASE

by Dale Gruis

Estimated Percentages by Learning Style: Auditory learners – 20% to 35% of students, Kinesthetic learners – 10% to 30% of students, and Visual learners – 40 % to 65 % of students

Be-Quiet-Listen-Take-Notes (BQLTN) vs. Curriculum for Agricultural Science Education (CASE)

The BQLTN Approach to learning is widely used, but is a preferred learning style only for auditory learners, an estimated 20% to 35% of students. Fortunately some educators, especially career and technical educators, realize that some students' learning styles are not compatible with some teachers' teaching styles. In my opinion, CASE can take teaching and learning in agriculture to a new level of excellence.

The Iowa Association of Agricultural Educators (IAAE), through the Iowa FFA Foundation, secured a $25,000 sponsorship from Cargill, Incorporated to sponsor a CASE AFNR Institute. The Cargill sponsorship significantly decreased school-incurred costs of hosting the CASE AFNR Institute, and increased the number of educators/schools that could afford the professional development. The $25,000 sponsorship dramatically decreased per teacher costs to educators and their schools. Agribusiness support of this initiative is logical; we hope to provide a stronger education for future agriculture industry employees and leaders.

We cannot accurately articulate the combined appreciation of CASE Institute participants toward Cargill. We can accurately describe how a major agribusiness has assisted agricultural educators to access a curriculum that is strongly supported by brain-based learning strategies. Cargill was an invaluable leader in assisting agricultural educators learn to use a curriculum that will enhance teaching and learning for students who may one day be critical personnel of the agriculture industry. Without Cargill's financial support, our CASE Institute probably would not have been conducted.

Phenotype = Genotype + Environment

Agricultural educators understand that phenotype (observable physical and/or biochemical characteristics) is influenced by both genetics and the environment in which the individual develops. Genetic information is coded by gametes through reproduction. Environment includes both the physical and psychological surroundings in which an individual matures. Two genetically identical organisms that mature in different environments may be phenotypically different. Inherited genetic material can only be changed through rare genetic mutations; whereas, the environment in which an individual matures can more easily be changed.

The CASE approach to teaching and learning can significantly impact the learning environment. CASE can create a consistent, nationwide learning environment in agricultural education that can significantly impact and improve learning by fully embracing all learning modalities. CASE lessons emphasize creativity and innovation, rather than memorization and regurgitation. Because CASE was created by agricultural educators, it was designed to effectively embrace changes in the adolescent brain. In layman's terms, the following outlines a few characteristics of adolescent brain development that experienced educators can appreciate:

Adolescent Brain Development (Inside the Teenage Brain, Frontline)

- From birth, pruning of neurons occurs in stages and continues through adolescence into adulthood.
- Teenagers' minds tend to have a tense mix of old primitive features and new modern ideas.
- Teens tend to manifest ancient clan behavior while developing individual, modern personalities.

- Teens tend to cluster in small groups with strict inclusion/exclusion rules.
- Family values and teenager group values often conflict, and the conflict is often not resolved in favor of family values.
- Neuron connections that are not frequently used are pruned to focus resources on frequently used neuron connections.
- Neurons are believed to impact differentiation of mental ability.
- Pruning of neurons is believed to increase specialization of thinking and decrease randomness of thinking.

Brain-Based Teaching Strategies and CASE

Understandings of brain-research have increased dramatically in recent years. It is time for agricultural education to utilize brain-friendly teaching and learning techniques. Many current strategies in the table, "How Can Research On the Brain Inform Education?" reflect components of the historic Ag Ed Model.

CASE is definitely not BQLTN. Many quality curricula exist, CASE is a quality set of ready-to-use lesson plans tied to a quality philosophy of education, the Ag Ed Model. A strong agricultural economy may be more important in our future, than it was in our past. Now is the time for Ag Educators to work together to promote utilization of brain-friendly learning. Agriculture industry support will be a required component to transform Team Ag Ed into Team AFNR (Agriculture, Food and Natural Resources).

References

Learning Modalities: Pathways to Effective Learning. http://www.pbs.org/teachers/earlychildhood/articles/learningmodalities.html

PBS Special - Frontline - Inside the Teenage Brain. http://www.pbs.org/wgbh/pages/frontline/shows/teenbrain/

How Can Research on the Brain Inform Education? http://www.sedl.org/scimath/compass/v03n02/brain.html

Caine, R.N., Caine, G. (October 1990). Understanding a Brain Based Approach to Learning and Teaching. Educational Leadership 48, 2, 66-70. (Excerpts). Adapted by permission of the Association for Supervision and Curriculum Development. Copyright 1985 by ASCD.

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How Can Research on the Brain Inform Education? Implications for Teaching

Recent Research Suggests	Teaching Suggestions
The brain performs many functions simultaneously. Learning is enhanced by a rich environment with a variety of stimuli.	Present content through a variety of teaching strategies, such as physical activities, individual learning times, group interactions, artistic variations, and musical interpretations to help orchestrate student experiences.
Learning engages the entire physiology. Physical development, personal comfort, and emotional state affect the ability to learn.	Be aware that children mature at different rates; chronological age may not reflect the student's readiness to learn. Incorporate facets of health (stress management, nutrition, exercise) into the learning process.
The search for meaning is innate. The mind's natural curiosity can be engaged by complex and meaningful challenges.	Strive to present lessons and activities that arouse the mind's search for meaning.
The brain is designed to perceive and generate patterns.	Present information in context (real life science, thematic instruction) so the learner can identify patterns and connect with previous experiences.
Emotions and cognition cannot be separated. Emotions can be crucial to the storage and recall of information.	Help build a classroom environment that promotes positive attitudes among students and teachers and about their work. Encourage students to be aware of their feelings and how the emotional climate affects their learning.
Every brain simultaneously perceives and creates parts and wholes.	Try to avoid isolating information from its context. This isolation makes learning more difficult. Design activities that require full brain interaction and communication.
Learning involves both focused attention and peripheral perception.	Place materials (posters, art, bulletin boards, music) outside the learner's immediate focus to influence learning. Be aware that the teacher's enthusiasm, modeling, and coaching present important signals about the value of what is being learned.
Learning always involves conscious and unconscious processes.	Use "hooks" or other motivational techniques to encourage personal connections. Encourage "active processing" through reflection and metacognition to help students consciously review their learning.
We have at least two types of memory: spatial, which registers our daily experience, and rote learning, which deals with facts and skills in isolation.	Separating information and skills from prior experience forces the learner to depend on rote memory. Try to avoid an emphasis on rote learning; it ignores the learner's personal side and probably interferes with subsequent development of understanding.
The brain understands best when facts and skills are embedded in natural spatial memory.	Use techniques that create or mimic real world experiences and use varied senses. Examples include demonstrations, projects, metaphor, and integration of content areas that embed ideas in genuine experience.
Learning is enhanced by challenge and inhibited by threat.	Try to create an atmosphere of "relaxed alertness" that is low in threat and high in challenge.
Each brain is unique. The brain's structure is actually changed by learning.	Use multifaceted teaching strategies to attract individual interests and let students express their auditory, visual, tactile, or emotional preferences.

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Upcoming Themes

March April

Going Green with Agricultural Education

Many times local agricultural education programs are leaders in implementing new ideas/technologies into the local community. This issue will explore ways local programs are incorporating "green" techniques into their curriculum.

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May June

Serving Students with Special Needs in Agr Educ

Meeting the needs of students will disabilities has been formalized in the past 30 years to include "504 Plans," "Individual Educational Plans (IEPs), as well as access to new assistive technologies. What gains and creative responses worked in your program? What specific challenges face agriculture teachers who teach subject matter that includes psychomotor skills, leadership, and SAEs?

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July August

Using Interactive Technologies in Agricultural Education

Facebook, Twitter, personal response clickers, texting, gaming technologies…. The list of interactive technologies goes on. How are agricultural education teachers taking advantage of interactive technologies to enhance their educational activities?

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September October

The CASE initiative

The Curriculum for Agricultural Science Education™ (CASE™) project has developed a structured sequence of agriculture courses and serves as a model for elevating the rigor and relevance of agricultural education. This issue will explore the successes of the CASE™ curriculum in agricultural education.

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