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Developing the Exceptional Teacher

Continuous Growth through Continuous Development

by John C. Ewing

No matter your vocation, there is a need for continual improvement. In agricultural education, we have multiple opportunities available to grow as educators. Resources are available to strengthen our knowledge, skills, and dispositions related to pedagogy and technical content in agricultural education. Teachers can apply for scholarships to attend conferences and workshops through

to improve in these areas. While the teacher may be able to identify their needs on their own, a better model is to develop a team to help guide them in their professional development. This team could include peers, mentor teachers, administration, and teacher educators. By working with this team a teacher can effectively develop an individualized professional development plan that will serve the teacher as they determine the experiences required to become a better educator.

mer, or this coming school year? How are these experiences interrelated, and how will you be sure to get the most out of each experience? Take time to think about what each article has to offer you. Allow the articles to motivate you as you push forward in becoming the best agricultural education professional that you can be for your students!

“Who dares to teach must never cease to learn” -John Cotton Dana

their professional organizations, government agencies, industry supporters, and universities. Take advantage of this support to meet your learning needs.

Through teacher certification programs, students receive training that will enable them to enter the profession. However, each student has different needs during the program. Teacher education programs need to structure and identify what should be taught pre-student teaching and what can be better learned during student teaching. Each specific content and pedagogical approach cannot be taught in-depth during the pre-service experience; thus, there must be continual professional development for our teachers when they begin teaching. Whether they are in their first year, or their twenty-first year, teachers need to consider their opportunities for growth, and develop a plan

The current issue of the Agricultural Education Magazine provides great information on how to continue in developing as a professional educator. Teacher development is examined from multiple perspectives; current secondary school-based agricultural educators - new and beginning teachers, as well as more veteran teachers, teacher educators, and other post-secondary college of agriculture faculty. Articles in this issue of the Magazine help you to develop as a professional educator. Articles include insights into experiences such as field days, how to handle stress, seeing professional development as an investment in your career, and how research has helped develop quality programming for our teachers.

One goal of this issue is to help you reflect on your own professional development plan. What areas do you plan to grow in this month, this sum-



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A City Girl Turned Agricultural Educator and the Learning Along the Way

by Rebecca G. Lawver

It's been over twenty years since I decided that I wanted to be a high school agriculture teacher. My journey is interesting, because I'm not like many of you.

I grew up in the suburbs, outside of Omaha, Nebraska. My dad was an engineer and my mom was a nurse. My high school experience was filled with dance team, cross country, and theater (notice I didn't mention FFA). We didn't live on a farm, in fact my grandpa sold the farm in the 60's. So, how in the world, did this city girl find such an amazing career?

I found agricultural education by accident or maybe it was divine intervention? Either way, I had absolutely no idea that two things I had an interest in, teaching and agriculture, even existed together in a space that could make a difference in the world. Stumbling upon agricultural education was a game changer for me! I finally found what I was looking for in a career. Although, given my background it wasn't easy, I was told there would be no way any school would hire "a girl, with no agriculture and FFA background." What's a girl to do?

This girl, approached this challenge head on! I did this in a variety of ways, continually challenging myself to learn more, taking part in high-quality professional development, and taking advantage of opportunities to improve and increase my knowledge about agriculture, quality teaching, research-based collaboration, diverse learning, learning environments, and assessment. I want to take you through some of my experi-

ences in learning, to challenge your thinking and to give you something to think about the next time you find yourself in a teachable moment.

Just Listen

"When people talk, listen completely. Most people never listen." Ernest Hemingway

One of the first things I learned as an "outsider" to agricultural education was to listen to others. It was important for me to listen to others comments, pay attention to feelings and ideas, clarify any misconceptions or misunderstandings, and to maintain an open mind in order to make meaning from the conversations.

Today our jobs descriptions often include the phrase strong communication skills, both written and verbal. But do we ever consider that the fundamental part of communication is listening? Listening is an essential piece of leadership and our professional development. It is vital that we continue to listen to each other; the insiders and the outsiders, the laggards and the early adopters, the traditionalists and revolutionaries, and to our students. Listening to each other is going to be crucial to forming a complete picture of the future of agricultural education.

"Be persistent in the pursuit of your professional goals, but also connect with other professionals who can help you manage your challenges and who cheer you on!"

Be Persistent

"Persistence is incredibly important. Persistence proves to the person you're trying to reach that you're passionate about something, that you really want something." ~Norah O'Donnell

Every time we get together as agricultural educators the opening remarks go something like this: "I am a product of agricultural education!" or "Each one of you had an ag teacher who made a difference in your life!" Every time I hear these comments it reminds me that I'm not a product of agricultural education in the traditional sense. But it also reminds me that persistence is key. It is the determination and the ability and desire to learn new things. It's being willing to grow and tackle problems head on. Persistence helps us set and accomplish goals, prepares us for obstacles and setbacks, helps us maintain focus, and seek those who support and encourage us.

We teach our students to be persistent and to reach their goals. But do we do enough to help each other? Be persistent in the pursuit of your professional goals, but also connect with other professionals who can help you manage your challenges and who cheer you on! Take that new teacher under your wing, put your arm around them and say "It's time. It's time for you to be a leader." Just like my mentor did to me...another game changer! To think that there was actually someone who believed in me enough to help me persevere changed how I thought about being a teacher. It was his persistence that helped me see the teacher I could be.

The Agricultural Education Magazine

Take Responsible Risks

“To live a creative life, we must lose our fear of being wrong.” ~Joseph Chilton Pearce

We all know the first “responsible” risk I took was changing my major to agricultural education. But, the little risks between then and now have all added up to this great career.

No ag experience. I got a job at a farm store and went home with any friend who would take me, to brand cattle and pick corn.

You’re a city girl. How about I go student teach 8 hours from home in a two teacher program, teaching animal science and welding?

No one’s going to hire you. I took my first job in the Sandhill’s of Nebraska and taught some of the hardest working kids in the land!

There’s been other responsible risks since then, but being adventurous and continuously trying new things has had a tremendous impact on my development as an educator. Don’t be afraid to try something new. Even if it fails, you’ve learned something.

Think Flexibly

“The measure of intelligence is the ability to change.” Albert Einstein

Current trends in agricultural education have suggested a need for more teachers in agricultural education and our demographics are shifting in our preservice teacher programs reporting a female demographic of up to 67% and approximately 17% of new teachers have entered the profession through an alternative route (Smith, Lawver, Foster, & Thompson, 2017).

Times have changed in the last twenty years. Maybe it’s time to think beyond the box? Do we have the ability to change our perspective about agricultural education and who we recruit as new teachers? Have we considered the input of all of our stakeholders? What do the shifting demographics mean for students?

I believe we will continue to see exceptional educators enter agricul-

“Be open to new knowledge and welcome new information on all subjects and in a variety of settings. It is critical for educators at all levels to have a life-long learning mentality.”

tural education who come from all walks of life; those who come from an agriculture and FFA background and those who do not. As educators we need to approach this with an abundance mindset – we need to be flexible and accepting of others who don’t have the same background and preparation as us and help everyone develop into quality teachers.

Remain Open to Continuous Learning

“A good teacher can inspire hope, ignite the imagination, and instill a love of learning.” ~Brad Henry

Become or continue to be a learner. Don’t be afraid to admit that you don’t know. Take it from a girl who once had no agriculture experience! Be open to new knowledge and welcome new information on all subjects and in a variety of settings. It is critical for educators at all levels to have a life-long learning mentality. There are new strategies, new technologies, and current events that can keep us relevant and on the cutting edge of our field.

Throughout my career I have learned many things in formal professional development workshops. Yet, I have also learned from other teachers, students, and parents. I believe it takes a combination of these experiences to help you retain your creativity, innovation, and your connection to students. Approach your professional development as a sustained component of your classroom that is on-going and incorporates a variety of experiences that are consistent with your goals. In the end, what matters most, is what you learn and how you use it to make a difference in the lives of your students.

References

Smith, A. R., Lawver, R. G., Foster, D. D., & Thompson, E. (2017). 2016 National Supply and Demand Executive Summary. Retrieved from <http://aaae-online.org/resources/Documents/NSD-2016Summary.pdf>



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Making the Most of Your Professional Development Experience

by Megan Chicos and Catherine DiBenedetto

As educators we strive to further our knowledge in order to effectively communicate concepts to our students. We look for ways to stay current on emerging and proven agricultural techniques and methods, as well as learn what is being phased out. One way to stay current is to attend professional development programs that introduce new trends and explain how they are relevant to the industry, which in return, helps us prepare our students for college, a career, and to be a positive contributing member of their community.

Agriculture related programming that agricultural educators may attend for professional development are primarily field days and workshops. The information covered at a field day tends to be broader than information covered in a workshop. For example, a wheat production field day may include information on varieties, fertility, pest control, irrigation and soil testing. In comparison, workshops are typically on a specific topic such as integrated pest management, honey beekeeping, turfgrass management, community vegetable gardens, food preservation, and composting. Regardless, programs are led by a specialist and typically hosted by industry or land grant university extension programs. Field days are a great way to learn about equipment and management practices in use. Since field days tend to be demonstration oriented, they are a great way to get ideas on how to convey the information to students in as well as out of the classroom. Workshops tend to be

a hybrid of formal and some hands-on instruction.

After attending an educational program, you may think to yourself, “Wow, how am I going to incorporate these concepts into my classroom?” This is a good question, and one that should not be overlooked. Many educators attend educational programs with the intention of utilizing the new information in their classroom. Unfortunately, they go home, mull over the information, and realize they do not know how to incorporate the material into their curricula. Luckily incorporating new material learned from educational programs can be simpler than one may think.

“Field days are a great way to learn about equipment and management practices in use. Since field days tend to be demonstration oriented, they are a great way to get ideas on how to convey the information to students in as well as out of the classroom.”

Here are a few steps to assist you in determining how to effectively utilize your professional development experience:

1. When you sign up for a professional development program, schedule time directly afterwards for review and curriculum development. This encourages you to build your lesson plan while the concepts are still fresh in your mind.
2. Throughout the programming, take note of which concepts are of particular interest to you to incorporate into your curriculum.

3. Stick to your schedule! After the programming, select one or two of the concepts you noted as interesting and outline a lesson plan to convey the concept.

Example: While attending a professional development workshop on soil health for crop production, you noted of importance (a) irrigation water pH influences plant availability of nutrients, and (b) the influence of water pH on soil pH will vary depending on soil constituents. Directly after the program, review and outline how you could teach your students about the importance of pH on crop development and productivity, and why different soils have different pH. Keep in mind that real world examples make the topics relevant and more interesting for your students. Based on those criteria, you can then come up with a lesson plan that not only engages your students but also meets the national Agriculture Forestry and Natural Resource (AFNR) standards.

Sample Lesson Plan

Course: Plant Science

Grade level: High School

Duration: 50 minutes to introduce lesson and start experiment, 10 minutes for the next four weeks will be needed each day for students to check their plants, and 50 minutes at end of a four week period to wrap up and reflect on experiment.

Unit: Soil pH and the effects on crop production. This lesson should come after an introductory lesson on pH.

National AFNR Standards addressed:

- PS.01. Develop and implement a crop management plan for a given production goal that accounts for environmental factors.

- PS.01.01. Determine the influence of environmental factors on plant growth.
- PS.01.01.03.a Identify and summarize the effects of water quality on plant growth, (e.g., pH, dissolved solids, etc.).
- PS.01.01.03.b. Analyze and describe plant responses to water conditions.
- PS.01.01.03.c. Analyze plant responses to water conditions and recommend modifications to water for desired plant growth.

Lesson Objectives:

Students will be able to

- Illustrate how water pH affects plants and soil
- Demonstrate the difference between basic and acidic
- Evaluate how irrigation and rain-water affect pH

Materials:

- Various water samples
- Baking soda
- Vinegar
- Plants (enough to water with each type of water sample)
- Preferably two different plants varieties
- Could have one variety that prefers acidic conditions and one that prefers alkaline conditions
- Could utilize crops commonly grown in the area: corn, soybeans, alfalfa, etc.
- Litmus paper

Procedure:

Opening- Activating Strategy (10 minutes)

- Ask students a few questions about pH
- Do you think various water samples have different pH levels?
- Are farmers concerned with soil pH? Why?
- After a brief review of the previous lesson that introduced pH, have students watch one of the following videos on what is soil pH and the importance of pH to farmers for plant production

- <https://youtu.be/bQ9HXD-ACRws>
- <https://youtu.be/AgEz2JuyVDQ>

Activity I (15 minutes)

Preparation:

- Create a one page paper on how to collect the sample. (Utilize resources from your local extension agency)
- Obtain enough 1 gallon plastic bottles for all students and place labels on the bottles.
- Instruction: Have students bring a water sample into class (have extra samples available for students to analyze)
- Hand out bottles with blank labels for water sample collection.
- Show examples of where samples could be collected.
- Demonstrate the triple rinse method and explain why the method is used.
- Show examples of how the label should be filled out to reflect where the water sample was collected.

Activity II (20 minutes)

Preparation:

Prepare water samples to supplement samples students bring in. You do not have to obtain all of the following, but be sure to prepare the alkaline and acidic water samples

- Distilled water
- Rainwater
- Municipal water
- Well water
- Alkaline Water

In 1 tsp increments, mix in baking soda to 1 gallon distilled water until a pH of 7.5 or higher (optimal pH for most agricultural plants is 5.8-6.5, may need to adjust for plants you are using)

- Acidic Water

In 1 tsp increments, mix vinegar to 1 gallon distilled water until a pH of 5 or lower is obtained (optimal pH for most agricultural plants is 5.8-6.5, may need to adjust for plants you are using).

Develop a worksheet for each group to complete. The worksheet should include (a) a table for students to complete with information on student's name, sample description and pH value, and (b) inquiry based questions to relate sample description to pH values obtained.

Instruction: Measure pH

Instruct students how to use the litmus paper and read the scale.

Group 3-4 students to work together to measure the pH of all the water samples and complete the worksheet. Once the pH is measured have students hypothesize which water they think will be best to water the plants with (most plants will work for this lesson just make sure to check optimal pH levels for the plants used so you can alter the water samples accordingly)

“It is important for agricultural educators to attend professional development events that can be connected to the curriculum and is applicable to various careers within the agricultural industry.”

Activity III (5 minutes first day, 10 minutes/day next 4 weeks)

Preparation:

- Randomly assign groups a water sample to water their plant
- Give each group two of the same plants
- Record the initial weight, height, number of fully expanded leaves, color, and general plant health

Instruction: Have students make daily observations and water their plant when needed.

1. Have students observe their plant each day and record observations
2. A few observations they can make are on weight, plant height,

number of leaves fully expanded, plant color, and general plant health

3. Demonstrate when the plants should be watered

- Over watering can have adverse effects on the plant

Questions students can answer in their observations

- How has your plant been affected by the water you have been using? How or why do you think your plant has changed?
- Based on the hypothesis you made at the beginning of your experiment, is your plant reacting the way you anticipated?

At the end of the experiment have students answer the following questions:

- What changes did you see in your plant throughout the experiment?
- How do you think rainwater and irrigated water affect plant growth?
- Why is pH variation a concern in production agriculture?
- What would you, as a farmer, take into consideration when deciding to irrigate your crops?
- If I, as a farmer, decided to plant a variety of corn that was more drought tolerant than varieties I have planted in the past, would this affect my view of pH?

Suggested Assessments

- Give students a soil analysis and have them focus on soil pH. Ask students to evaluate the pH of the soil and if the soil should be amended to make it more acidic or basic.
- Have students write an article explaining the importance of pH

and how it affects crop production. Students should write the article from an agronomist's view point for a crop producer audience.

This example lesson provides students an opportunity to actively learn about pH and crop growth and development. Students gain knowledge about crop development in regards to pH levels and tie in how this relates to production agriculture. Knowing the pH of water is important not only for farmers who irrigate their crops, but also for farmers who receive adequate rainfall. The pH of those two water samples can impact crop growth causing loss in yield. The content and learning objectives all relate back to your experience at the field day where you gained new professional knowledge.

Attending professional development or educational sessions as an educator is valuable and provides not only you, but also your students with ways to apply their learning inside and outside the classroom. It is important for agricultural educators to attend professional development events that can be connected to the curriculum and is applicable to various careers within the agricultural industry. By incorporating what you brought back from the field day into the classroom, you are engaging your students to critically think. Your students are not only learning about pH, but are experiencing how what they are learning has real world application. Students will also hone problem solving, research, and social skills along the way. Teaching agriculture at the high school and college level.



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What's Eating You? The Impact of Stress on Agriculture Teachers

by Erica B. Thieman

"I have learned to use meditation and relaxation to handle stress...Just kidding, I'm on my third glass of wine."

Does the quote above sound familiar to you? Maybe you have even said something similar yourself. When I was teaching high school agriculture, I belonged to a group of teachers who lived for our mid-week Happy Hours at one of several local watering holes and also the regular weekend gatherings that typically involved consumption of alcohol (even in copious amounts at times).

Stress, when unmanaged and experienced at high levels on a regular basis is called chronic stress and can have many long-lasting negative impacts on health and even thinking ability. For a teacher, stress can affect the ability to make decisions, patience and demeanor with students, and even ability to think critically. The impacts of this stress on our bodies ranges from high blood pressure and lost sleep to forgetfulness and gastrointestinal issues. It is not logical to completely remove stress from our lives, and especially the life of a teacher. Stress is a natural response to environmental stimuli and serves essential functions in survival situations. Where we can and must intervene, especially for teachers, is in developing and using effective management and coping techniques in dealing with the daily stressors teachers encounter. The responsibilities and characteristics of the job of an agricultural educator can often add extra stressors to our lives when compared to other classroom teachers.

As a former high school agriculture teacher who is a fourth generation teacher, the trials of teachers are very familiar to me. I have been studying

stress and resilience in teachers for eight years and if you count my five years of teaching high school as in-the-field research on stress I have 13 years. I have talked with hundreds of teachers and preservice teachers about their personal and professional stress. I have put heart rate monitors that also measure movement and respiration on hundreds of people to study how the body responds to stress. In decades of research on teacher stress, we have yet to observe teacher stress declining while in fact, it continues to rise.

"Stress, when unmanaged and experienced at high levels on a regular basis is called chronic stress and can have many long-lasting negative impacts on health and even thinking ability."

Part of the problem is how researchers have typically measured teacher stress in the past. Providing teachers with a questionnaire where they are asked to rank the impact of various factors related to their job that causes them stress is the method for the majority of studies on teacher stress. This method is problematic because the timing of when a teacher fills out a questionnaire can make all the difference. I always want to know exactly when participants filled them out because I know that I would have filled the questionnaire out differently if it was right before a break, or soon after returning from a break. Was it early December or early September, was it filled out on a Thursday afternoon or a Saturday? There are numerous factors impacting teacher's views on stress and their job. The overarching theme with measuring teacher stress with questionnaires is that it is ultimately measuring how a teacher perceives stress rather than measuring

actual stress. Through using hormone levels like cortisol, heart rate, respiration, and motion, I can measure actual teacher stress by physiological markers. Additionally, I am collecting this data for five-day-long periods of time and multiple time periods in the school year.

In working with teachers and preservice teachers, I have found that people who experience moderate to high stress levels have a difficult time in describing and pinpointing things that cause them stress. They will often attribute symptoms of stress, such as fidgeting, sweating, reddening of the face and neck, chronic headaches, and even sleep disruption to factors that do not include stress.

Interestingly, I have found major differences between higher and lower stress teachers when questioned about why particular lessons or activities did not go according to plan. The medium and higher stress teachers tend to externalize the blame on the dissatisfactory lesson on factors beyond their control, such as general disrespect from students stemming from parenting, proximity to an upcoming holiday, and even the phase of the moon. The lower stress teachers tend to focus on factors they can control, such as an ineffective teaching method or approach used, lack of preparation, or their emotional state.

The different outcomes these perspectives produce in a classroom is vast! The teacher who views the disruptive factors on things beyond their control is likely to change little before the next class or next time the teacher uses the lesson. The teacher who considers the disruptive factors as well within their control will be more likely to problem solve to de-

termine what strategies could improve the outcomes of the lesson or class.

I also heavily focus on sleep and

“The medium and higher stress teachers tend to externalize the blame on the dissatisfactory lesson on factors beyond their control, such as general disrespect from students stemming from parenting, proximity to an upcoming holiday, and even the phase of the moon.”

recovery in my work with teachers. Three factors I find to be common issues with teachers that impact stress are: physical activity, the amount of time spent sleeping, and consumption of alcohol. Researchers, including myself, have found that in general people who get 7,500 or more steps in a day have better recovery during their sleep. It is important to note that a device worn on the chest, not the wrist, calculated those steps. Step counters are worn on the wrist, such as FitBits often over-count steps due to arm and hand movement. I recommend a minimum of 10,000 steps if using such a device. The amount of time spent sleeping is essential to recovery, as adults need eight to nine hours of sleep per night. I have people (including myself once upon a time) who tell me all of the time that they have “adapted” and function quite well on five or six hours of sleep. This myth of low-sleep adaptation entirely false as when we consistently are sleep deprived (less than eight hours per night), our brain functioning suffers and in fact can be correlated to the equivalent of the brain function of someone who is alcohol-intoxicated. Consumption of alcohol is a significant detractor of recovery in sleep, it might help some people get to sleep, but until

the body entirely processes all alcohol, the heart rate will be elevated by 10-15 bpm, and the body is in a stress response state. It takes approximately one hour for the body to process a serving of alcohol, so multiple drinks in the evening can have an adverse impact on quality and sleep recovery.

Part of my mission in life is to improve teacher’s lives with my work, so I would be remiss if I did not provide my readers with some concrete strategies for management of stress specifically geared for teachers. These recommendations that you can begin implementing today follow:

- 1.) Protect your sleep and work hard to get eight to nine hours a night.
- 2.) Plan alcohol consumption accordingly so that it does not impact sleep recovery (earlier in day or fewer servings).
- 3.) Breathe. Taking three very deep breaths will instantly lower stress hormones in your brain and body and allow you to make better decisions and think more clearly.
- 4.) Reduce the impact of cell phones on sleep. If you cannot put phone in airplane mode or turn off at night, move it to at least five feet away from your head. The cellular signals interfere with your sleeping brain waves.
- 5.) Read an old-fashioned book! At a minimum of 30 minutes before ..sleep, stop looking at any form of electronic screen (phone, computer, e-reader, television). The light emitted confuses your brain into thinking it is daytime and inhibits melatonin production which signals sleep.

I do also provide professional development for schools where teachers have the opportunity to wear the heart rate monitors and learn about some specific strategies to implement that I personalize for them. You can obtain more information by reaching out to me at Thieman@illinois.edu



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An Evaluation Horror Story: Non-Traditional Ways to Get Involved in Professional Development

By Renee Ancell and R. G. (Tre)
Easterly III

When I first started teaching, the thought of an evaluation system caused a great deal of anxiety. I had heard many horror stories about teachers who were penalized for taking all of their sick days or being fired for an evaluator's opinion. I was concerned about being evaluated by someone who knew little about agricultural education or the grade levels I taught. The mystery surrounding the evaluation process was terrifying. During my first year as a teacher, I was evaluated by the State Department of Education and by my principal. Because of the relationship I had with my principal, his familiarity with my teaching style and with my students, I was not nervous about him being in my classroom. However, the thought of having an evaluator from the State Department of Education was a little more jarring. I was concerned they would not be able to see my full range of instruction during such a short evaluation. How can this person make a fair assessment of my teaching without any prior knowledge of my students or my content area? What if something happens that is beyond my control? How can I fit everything into a lesson that this person wants to see? These thoughts haunted me.

The day the State PED evaluator come into my class, I led the students through an activity that taught them about careers in the beef industry from farm to plate. I felt great after the lesson. I thought it was well put together. There were no behavior issues to speak of. In fact, my class that was typically shy actually participated in discussion! I thought I

did well, until I spoke with the evaluator. Before she left my classroom I explained to her that I was a first year teacher and would really appreciate her feedback. She then spoke the words that to this day make me cringe and want to cry. She said "well it needs a lot of improvement". That was pretty much all I heard from the entire conversation. She did not give me any positive feedback at all. I was crushed by her words. For a first year teacher, I guess it is hard to hear only negatives, especially since I worked so hard to perfect my teaching and wanted to do my best.

Now, as I finish up my third year teaching, looking back on that day, those words pushed me to find every resource I could to become a better teacher so I would never have that experience with an evaluator. The initial shock left me feeling disappointed, but I was able to turn my disappointment into motivation. That experience led me on a journey of gaining knowledge to improve who I am as a teacher.

As an agricultural educator, we do not just teach about agriculture, we integrate every subject into the curriculum. In each lesson, the students can see math, science, history, and English applied in a meaningful way. School districts often provide some professional development, but it is usually designed with core teachers in mind. It is part of our job to be involved in what is provided by our districts as well as find our own professional development that helps us provide meaningful instruction.

The first thing that comes to mind when teachers think of professional development is conferences and workshops. Professional development is any activity that is intended to

prepare teachers for improved performance (Little, 1987). Activities can include informal dialogue, courses and workshops, reading professional literature, education conferences and seminars, professional development networks, individual and collaborative research, mentoring and peer observation, and qualification programs (Organisation for Economic Co-Operation and Development, 2014). Here is a list of activities I would recommend to grow as a professional that fits the broader definition of professional development:

1. Get involved in your community. I know what you are thinking, with what time? Here is the trick. Get involved in organizations that are part of your agriculture teacher duties. For example; fair board, cowbells, soil and water conservation. All of these organizations not only have conferences but they also have community members that can teach you something. Soil and Water Conservation has great resources if you want to learn more about plant identification, land, pasture and range, or homesite. So why not take a day with your CDE Team or by yourself and go around your area with this expert to learn what they have to offer.
2. Visit Local Producers. This might not improve your pedagogical practices, but it will help you learn new things about the industry. It can also give you guest speakers or you could take a video of the tour of the farm to show in your class.
3. Become friends with your county extension agent. Not only can you spend the day with them and learn something, a lot of the time

you share the same kids. Talk to them about going to livestock school or ask if they know of any workshops going on.

4. Go to your state agriculture teacher conference. This is a great time to network with others as well as learn from the older teachers who have been doing this for 30 plus years.
5. Attend National Agriculture Conferences. Sometimes community organizations will do scholarships for teachers to go to these conferences. For example, in some areas Farm and Livestock Bureau sponsor teachers to go to National Agriculture in the Classroom conference. I personally was able to attend this conference and although a lot of it was for younger kids I did get a lot of great ideas as well as resources to share with my students.
6. Look for National Conferences in other subject areas. There are so many conferences available that would fit into agriculture. I would suggest going to a National Science Teacher Conference. They have great workshops, technologies, strategies, and resources that can be used in an agriculture classroom.
7. Take a day to visit another agriculture teacher that is in or around your area. I think this is great because we all teach differently. For example, most of us teach the FFA Creed in our introduction class but it is amazing to see how different we all teach it. I have seen teachers who have their students draw pictures for each words as well as teachers who go over the creed and then give the students 3 weeks to memorize it. We all have a way to teach different topics so we can all learn from each other.

8. Visit another teacher in your school. This will allow you to see how others in your school teach. It will also look good to your administration that you are willing to go observe another teacher. Plus, this can be done with little to no preparation and on any day you and the other teacher discuss. I have done this multiple times and have found that it has helped me to learn new things on classroom management or assignment ideas.
9. Join social media groups. We have a social media group in New Mexico where agriculture teachers can post questions or ideas. I love this because it does not take a huge amount of time and it keeps teachers in contact. I think there are also national agriculture teacher and general teacher groups you would just have to search for them. This can give you information on workshops, classes, or other opportunities that would be great professional development.
10. Explore the internet for resources. Yes, I do believe exploring Pinterest counts as professional development. Other examples include State extension, Ag in the Classroom, NAAE Communities of Practice, and so many others. Again, this will give you information on opportunities as well as lesson ideas.

Professional development should not be burdensome, nor should it be limited to a day full of boring inservices. It should be engaging and tailored to personal interests and needs. It is important to identify areas of growth. The teacher evaluation system is a great way to have other professionals help those areas that need improvement. For many, the evaluation system seems like an evil being that we just have to deal with. While it does have its faults, it allows

for personal reflection and identifies areas where growth is needed.

Joseph Joubert once said, “To teach is to learn twice.” Teachers must continue to grow and learn to be effective. I encourage you to pick one or two things you want to focus on each year and find ways to improve on them. As educators, we have a higher calling to teach students about agriculture and to help them be successful in life. We must be willing to keep learning to succeed at this amazing task not only for our students but for ourselves. Take advantage of the vast world of resources in front of you and explore.

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Developing the Exceptional Teacher: Thoughts from a Rookie Teacher Educator

by OP McCubbins

Secondary Agricultural Education teachers are important! Not only do they ‘stamp out ignorance’ (improve agricultural literacy), they often serve as an incredible role model for the students enrolled in their program. The momentous task of being a positive role model for these students may not always be glamorous, but it is necessary. I know firsthand how much of an influence an Agricultural Education teacher can have on an impressionable teenager; my Ag Teachers are the reason I went to college to become a teacher. I wanted to make a positive difference in the lives of students. Now, as a teacher educator, I try to relay the importance of this task to my post-secondary students.

Upon arrival at Tennessee Technological University (TTU), as an Agriculture Teacher Educator last fall, I sat down and really thought about how I should structure the program to ensure an exceptional teacher was developed. After considerable thought, I outlined four things that I wanted to guide the direction of the Agricultural Education program at TTU in my quest to Develop the Exceptional Teacher: 1) Don’t be afraid to fail, 2) Students as partners, 3) Be collaborative, and 4) Be balanced.

Don’t be Afraid to Fail

When I first approached the strategic planning process for the teacher preparation program at TTU, I thought everything had to be perfect. I thought that I shouldn’t take risks of

any kind. Then I thought back to my days as a secondary Agricultural Education teacher; I thought about the risks I took in designing assignments, or in my instructional delivery. I want my students at the post-secondary level to take risks, to try the new and unknown. I want them to know that it is ok to fail, as long as you learn from that failure. So I decided to be bold. I am transparent with my students when we are trying something new in the classroom; I will tell them that I am unsure if this method will work, but we will learn from it either way. I share my successes and failures with them and we process it as partners within the learning environment. I decided to engage my students as partners.

“My students have a say. They have a say because I treat them as partners in creating an educational journey.”

Students as Partners

Did you ever have much of a say in the direction of your college courses? My students have a say. They have a say because I treat them as partners in creating an educational journey. I feel it is important for their voices to be heard in developing assignments, specific content to be covered, and the grading policy implemented in the course. When I first arrived at TTU, I didn’t feel that way. I drafted a detailed syllabus, with a calendar full of due dates for homework assignments and readings. As I reviewed the syllabus, I kept questioning whether my students needed everything I included or not. On the first day of class, I scrapped the syl-

labus and challenged the students to develop one with me. We discussed their strengths and weaknesses relating to the course content, identified internal and external experts that we could bring in to speak, how learning would be assessed throughout the course, and established a periodic reflection session to adjust if needed. We spent the semester learning together. We 3-D printed animal cells to utilize in an Animal Science lesson, we created a solar-powered fountain during a renewable energy lesson, and we created a program within our department that allows other faculty members to request information and demonstrations on how to use various education technology tools. We did all of this by collaborating with others.

Be Collaborative

Collaboration is crucial for teachers and teacher educators alike. Tightening budgets often limit the amount of resources a program has access to. In our case, the students wanted to explore 3-D printing as a method of showcasing STEM in an agricultural context. We explored the resources we had available on campus and developed a partnership with the College of Engineering and the College of Business, and were granted access to the iMakerSpace. My students worked with computer science students to develop a 3-D animal cell model, printed it, and utilized in micro-teaching. This development stems from a willingness to reach out and ask to collaborate. For early field experiences, I rely on current teachers to provide honest assessments of our students’ competencies and dispositions. Our students work with

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Investing in Your Career: Building Career Wealth Through Professional Development in the Early Stages of the Career

by Ashley Cromer and Tyson Sorenson

I still remember it like it was yesterday, my first pay check as a newly hired agriculture teacher. After years of paying tuition, now I could literally see my hard work paying off. I felt good about earning a good chunk of change that first month on the job. However, I quickly began to wonder, “What am I going to do with all of this money?” So, after paying bills, I put the rest of the money into savings. A few months later, I received a call from a financial advisor who wanted to meet with me and discuss my financial plan. Wait, a financial plan? Aren’t financial advisors just for people nearing retirement? Well, I met with the financial advisor and quickly realized that putting a little bit of money into savings each month was not sufficient to accomplish my life’s financial goals. We put a plan together to help grow my wealth and help me set and accomplish long term and short term financial goals. Since then, I have seen my wealth grow over the years. I’m glad I met with my advisor early in my career so time could be on my side in accumulating wealth. This experience of growing financial wealth can teach us important principles of professional development: growing a wealth of knowledge or career wealth, through professional development opportunities.

Professional Development Early in One’s Career Increases the Overall Payout

Many beginning teachers who are struggling to figure out their craft

often say, “I can’t afford to invest my time into professional development right now. I will do it a little later in my career when I get my feet under me.” Our response: you can’t afford not to invest in professional development as beginning teachers. It is essential for survival, job satisfaction, and career success.

One thing all financial strategists agree about saving for retirement is the sooner you start the better off you will be. Those who think about retirement early on in their career and invest early on, reap greater rewards later. This principle is true with professional development—the sooner beginning teachers can invest their time into becoming better as teachers and leaders, the bigger the payout will be over the course of their career. Investing in professional development early in one’s career increases the overall payout in many ways including financially, program growth, personal growth, and autonomy. Teachers who begin investing in the future of their career from the start, develop a mindset of career success. They are conveying the message, “I chose this career and I want to be good at what I do, so it is worth the sacrifice to reap the reward of being a better teacher and advisor.”

Professional Development Increases Return on Investment (ROI)

In the financial world, ROI refers to a measure used to evaluate or compare the efficiency of certain investments. Investing money can be seen as a sacrifice because it is giving up money now with the hope of a greater reward in the end. Teaching follows

the same principle of ROI, or return on sacrifice. Teachers who sacrifice now for professional development, reap great short-term and long-term rewards. Such short-term rewards can include increased pay or stipend pay, licensure renewal opportunities, and licensure endorsement opportunities. Long term rewards might include overall program improvement, personal and professional improvement, student learning gains, and increased autonomy or career opportunities. As a new teacher, it is a sacrifice to give up time and sometimes money for professional development, but by doing so, the rewards in the end are greater than for those not making the sacrifice early on. For now, let’s focus on another financial principal that applies to teaching.

Professional Development Speeds Up the Maturity Date

In the financial world, maturity refers to the date on which some debt becomes due and is repaid to the investor. In the teaching world, we can think of this maturity date as when teachers become comfortable with their practice and the investment they made in learning to become effective teachers is paying off. For some, it takes 3-5 years for teachers to get to this comfortable place in their career, and many don’t make it and leave the profession early. The investment in professional development as an early career teacher can be a catalyst for maturity and career wealth. Skills and knowledge learned in those first few years of teaching can greatly speed up the time it takes to feel competent and confident.

Building Career Wealth Requires Sacrifice

As a beginning teacher, it is hard to think adding any extra to your plate can be a good thing. However, taking advantage of professional development opportunities as early as possible in your career will have great returns on your career wealth, despite the sacrifice and difficulty it requires. When I was a first-year teacher, it seemed I could barely keep my head above water. I remember the first month of my job when I was told I needed to take some college classes for endorsements on my license to be able to provide state Biology credit for my students as well as be able to offer Dual Enrollment courses with the local community college. By doing this, I could strengthen our local agriculture program while also gaining credits that moved me across the pay scale for immediate pay raises. Shortly after enrolling in courses I realized that my school district was paying teachers with English as a Second Language (ESL) endorsements extra stipends and providing reimbursement on course tuition. I decided to enroll in this program to get that ESL endorsement. This was one of the best decisions I made because not only did it increase my salary, it also provided me with great knowledge and skills in working with a diverse group of students. It helped me become a better teacher for my students. During my first year of teaching, I also participated in a teacher induction program through my school as well as through the state agriculture teacher's association. These courses and professional development experiences were a sacrifice on my time and my growing family, but I look back on that experience as one of the best decisions I ever made in my career.

Suggestions for professional development for early career teachers:

- Develop a plan, be strategic about what to do—As a begin-

ning teacher, it is wise to think about how you can get the most benefit out of your professional development experiences. Whenever possible, seek opportunities that allow you to move across the teacher salary schedule, advance your program, or expand your personal opportunities (e.g., endorsements, certifications, etc.). Methodically plan the professional development units you will need to take. Talk to people in your district and find out what programs they have for compensation of paying for professional development programs. The bottom line, try not to complete professional development just for the sake of it, get as much return on the investment as possible.

- What will benefit you or your situation the most? —When considering what type of professional development programs or areas you will pursue, think about what you and your program needs most. What are your weakest areas that you need to improve on? Develop a plan to improve those areas. What certifications are required to move your career or your program forward? Focus on these areas first. If a Biology endorsement is needed to increase the number of students you can reach in your program, why not pursue that? As a beginning teacher, it is important to participate in an induction program that exists at your school as well as through your state's teacher association.
- Take advantage of the professional development offered at your school/district—These opportunities are usually free of charge and provide a good chance to network with other teachers in your school. Some of my favorite and most memorable professional development experiences happened

within the local school district where I was able to learn from my colleagues. There are some amazing teachers and professionals we work with, make it a point to learn from them. Sometime the content or topics may not be the most applicable for you, but developing connections with other teachers and professionals as a beginning teacher can be just as beneficial.

Like retirement, investing early in a career through professional development will pay dividends and help to develop career wealth. Participating in professional development opportunities can help teachers develop into more competent and confident teachers, can help strengthen the local agriculture programs, position them for advancement and more autonomy in their career, and provide opportunity for more earnings. Investing in professional development early in a career can be a sacrifice, but the return on investment is worth it. Bottom line, early career teachers cannot afford not to pursue professional development opportunities.



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Teacher Professional Development Research: A Primer and A Look to the Future

by R. G. (Tre) Easterly III

As a new faculty member working as an agriculture teacher educator, I work with practicing agriculture teachers and preservice teachers. I have had the opportunity to see how teachers begin in their career and continue to grow as professionals. In my work, I have noticed that those individuals who work to grow and improve as a teacher, seem to enjoy their job and make a real difference in their students' lives. I have seen teachers become inspired by meaningful professional development and renew a passion for teaching. The phenomena is so perplexing to me, I have chosen to investigate how teachers interact with professional development to create this spark in as many teachers as possible.

This article serves as a brief primer for the research that has been done in the area of teacher professional development, particularly as it pertains to agriculture teachers, as well as a look to the future of research. But perhaps most importantly, this article explores the implications of the work completed in these areas to agriculture teachers and to the profession at large.

What the research says:

A quick look in the *Journal of Agricultural Education* will yield no fewer than 25 needs assessment studies. Professional development needs assessments are critical to understanding the needs of professionals in a certain state (e. g. Sorenson, Lambert, & McKim, 2014) or related to a certain area (Haynes & Stripling, 2014). Common themes that arise in these needs studies are items related

to leveraging and managing program funds, working with alumni and advisory groups, preparing for contests, and managing facilities. Some unique themes emerge when beginning agriculture teachers, for instance classroom management is a common theme needed for induction teachers.

More recently, researchers have begun to investigate how teachers interact with professional development as a total system, and explore the impacts on the teachers' well-being and practice as a professional. Through research on this level, we understand that when teachers collaborate with other professionals they will have higher career satisfaction (De Lay & Washburn, 2014) and teachers who plan their own professional development take more ownership in their practice and the profession (Westfall-Rudd, 2011).

The current research being conducted is related to Desimone's

(2009) Core Conceptual Framework for Studying the Effects of Professional Development on Teachers and Students. The model explains that if professional development contains the five core features (content focus, active learning, coherence, duration, and collective participation) then it will lead to an increase in teachers' knowledge/skills/attitudes/beliefs, which will create a change of instruction, which will ultimately improve student learning. Research has shown that programs like National Agriscience Teacher Ambassador Academy and Curriculum for Agricultural Science Education training fit this model and can lead to a real change in instruction (Shoulders & Myers, 2014; Thoron & Myers, 2011; Ulmer, Velez, Lambert, Thompson, Burris, & Witt, 2013). There may be some evidence to suggest that if agriculture teachers are purposeful about identifying their needs as a teacher and finding ways to grow in those ar-



eas, they may be able to link shorter duration professional development together to make meaningful change to their practice (Easterly & Myers, In Press).

What the research means:

Agriculture programs have become increasingly diverse. The demands placed on teachers continue to grow. The research suggests agriculture teachers should examine their own practice regularly and find ways to grow to get better. Attending summer agriculture teachers' conference alone is not enough to create meaningful change in practice that will have an impact on your students. Real growth can only come through meaningful reflection on practice and a mesh of professional development experiences that include professional collaboration, reading, watching videos, attending workshops, engaging in Professional Learning Communities, exploring new resources, and participating in professional organizations. Teachers must take ownership of their professional growth process.

What does the future hold?

The future of professional development is bright. Researchers are examining the relationship of resilience to professional development, exploring how relationships with administrators can impact professional growth, and investigating how professional development can lead to longevity in the profession. Most importantly, researchers in the field continue to do research for agriculture teachers rather than on agriculture teachers. As we learn more about how teachers' professional development systems can improve student learning, we can work collaboratively to improve the professional development systems available to the professionals who work with students every day.

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Utilizing Professional Development Schools to Assist in Developing the Exceptional Teacher

by Gaea Hock, Brandie Disberger, and Jon Ulmer

The student teaching experience has long been recognized as a key part of the preservice teacher education program. In an effort to increase the confidence and competence of preservice teachers Kansas State University utilizes professional development schools the semester prior to student teaching. Agricultural education students have the unique opportunity to work with current teachers as they prepare to enter their student teaching semester.

K-State agricultural education students have been working with professional development schools for over 20 years. The experience is modified each year based on feedback from previous students, the available resources, and the needs of the current class. Previous models have included spending a full day observing at each school then returning to teach at the same school the next week, faculty members visiting students as they teach on a rotational basis, and traveling with classmates without observation before teaching and no faculty observation.

During the fall semester of 2016, 20 preservice interns taught lessons in seven different schools. The experience began with the agricultural education faculty identifying potential schools prior to the fall semester. The teachers were contacted and given information to help them decide if they were able to serve as a host site. There were a total of seven schools selected based on a variety of items including teacher expertise, experience, geography, and willing-

ness to host the preservice teachers. Students traveled in groups of 3 (one group of 2) to teach four lessons to high school students. The preservice teachers and current agriculture teachers find these relationships mutually beneficial, David Holliday, agriculture teacher at Rock Creek High School, commented, "It is enjoyable to get to meet these young and upcoming professionals as they begin their transition from student to teacher. I have benefitted from teachers helping me to grow in the past and hopefully I can pass some of that on to the next generation of teachers. Their creativity and enthusiasm encourages me to try new things as well."

The agricultural education faculty took two instructional days with the students to travel to the seven schools. We wanted to showcase the programs and help alleviate the fear of the unknown. Students were able to ask the teachers questions regarding their technology, available resources, bell schedule and tour the classroom and lab areas. They also learned about the classes they may be asked to teach and particular student needs.

Dr. Hock facilitated the experience by communicating with the teachers about possible lesson topics and courses for the students to teach. The topics were then shared with the students and they were able to ask clarification questions to the PDS teachers via email or phone.

The agricultural education preservice teachers then planned and practiced their lesson (in a shortened format) with KSU Ag Ed faculty members prior to teaching it in the

PDS classroom. After teaching the lesson in the high school classroom, the preservice teachers received feedback from the PDS teacher and their fellow classmates. Once they returned to campus, the class had a discussion about the experience and what they learned. MaKayla LaRue, 2017 teaching intern, summarized her experience, "I gained experience while communicating with different agricultural educators, working with students and learning how to manage classroom conflicts as they arise during the lessons. The students allowed me to gain confidence with my abilities to teach however they also highlighted the areas that I need improve upon. After the students and lesson challenged me it was amazing to have an experienced teacher sit with me and discuss what I can improve upon and different techniques to try to make it more successful."



This past fall the students taught four lessons. The first lesson was on an agricultural issue that would fit in the selected course. Examples of lesson topics were GMO labeling, hormone use in dairy cattle, urban agriculture, feeding a growing population, right to hunt, water issues, pesticide/herbicide use and organic vs. conventional production practices. The second lesson was a specific content lesson intended to more naturally follow what was currently being taught in the high school classroom. The final two lessons consisted of a 2-day lab lesson. Teachers were given curriculum to choose from and the students were supported in planning, purchasing, and practicing for their lab. The four lessons were meant to build the preservice teachers ability to plan lessons, adapt existing curriculum, and facilitate active learning in their classrooms.

This experience is mutually beneficial for the university students, high school teachers, and the high school students. While the positive benefits for the university students are obvious, the teachers get an opportunity to give back to the profession. However, one of the most overlooked benefits may be to the high school students. John Kern of Washington County High School discussed the many benefits of the PDS program, “The opportunity to host the KSU Agricultural Education Students is a positive experience for our high school students as well. The Ag Ed Students work hard to develop quality lessons that enhance our current curriculum. The real-life teaching experience that they have in our high school classroom requires the future teachers to keep my students motivated and engaged in the lesson. The situation is designed to have a high level of accountability in order to elevate the quality of their lessons, which ultimately will better prepare them for their future careers.”

The students gain confidence and competence over the course of the semester. This is seen not only in their ability to plan a lesson, but is also recognizable by the PDS teachers as they teach their students. “I noticed the suggestions for improvements I

met before. It’s a challenge for them to feel like they’re connecting with the kids, but I’m always impressed with the quality of their lessons and the effort they put in to teaching,” commented KaCee Thompson, agricultural teacher at Hiawatha High

“These PDS experiences allowed me to gain valuable experience before student teaching so I am more confident and comfortable before entering my internship classroom. It was also an amazing opportunity to meet and get to know several agricultural education teachers across the state of Kansas. I believe that it was also a valuable learning experience for them as well since they are able to see the newest learning moments, technology applications and resources that are available in the field.” – MaKayla LaRue, 2017 Student Intern

made with the first group were improved upon by the second rotation and then the third. The confidence of the students grew as well,” said Andy Morton agriculture teacher at Wamego High School. The student interns also recognized how the experience helped them prepare for the student teaching experience. “Allowing us the opportunity to get in front of real teachers and students gave us the chance to put the theories we had learned in class to the test before we student taught. This allowed us the chance to try something that might not work and develop some of our teaching strategies,” shared Wyatt Wentz a 2017 student intern.

There are challenges for this type of learning activity. Preservice teachers had to learn how to deal with the chaos that is a typical school day; announcements, student releases, power outages, technology failures, and other disruptions. They had to adapt to the interruptions and adjust their lesson to accommodate them.

One of the challenges is planning engaging lessons for students they don’t really know. “It’s difficult for Ag Ed students to come into a class and try to teach a fun, meaningful lesson to a group of kids they’ve never

School. The preservice teachers commented frequently about their desire to get to know the students better.

The PDS teachers also recognize the challenges of hosting a preservice teacher in their classroom. David Holliday, Rock Creek High School stated, “For me the most difficult thing is trying to work the schedule to accommodate their lesson when at times, there are other things we should be working on or that might more natural fit within a unit plan.”

Students commented on what qualities make for a good PDS teacher. They mentioned the need for constructive criticism and advice in order to help them grow as educators. Preservice teachers wanted to know what went well as well as what they need to improve on. PDS teachers who share their ideas on how they would “change our lessons were especially beneficial when we were teaching the same lesson more than once throughout the day,” was mentioned by Wyatt Wentz.

Cody Holliday, a 2017 teaching intern commented on receiving feedback, “The PDS teachers gave us fantastic feedback on our lessons, shared ideas with us for future lessons, and gave us insight into what made their



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programs and their classrooms so effective. The opportunity to work with actual students helped us see the value of engaging students, recognize the benefits of communicating clearly, and realize the importance of knowing your students.”

They also appreciated PDS teachers who explained the facilities and technology available in order to aid them in planning their lessons. Good PDS teachers are also those who provide background information on their students and what they have already taught so the preservice teachers knew the readiness level of the high school students.

Students recognized how this experience helps prepare them for their own classrooms. For our students, the greatest benefit of this program may be the increase in the teaching intern’s self-efficacy, “Professional Development Schools helped me feel more prepared for the classroom prior to student teaching. Encouragement and feedback from the PDS school teachers and students truly helped me in preparing for going into the classroom” shared Melissa Poet, 2017 Student Intern.

We believe students must “learn to do and do to learn.” The use of professional development schools

allows students to put into practice the theories and strategies they have been learning during their college career. It also better prepares them for their student teaching internship the following semesters. In order to make this a high-quality learning experience, it does require planning and monitoring by university faculty members.

If you are able to work with preservice teachers, they are eager for opportunities to work with real students in real classrooms. While this experience requires a lot of preparation and planning, the benefit to all those is evident in their feedback.

Agriculture teacher preparation programs are always looking for ways to improve their programs. It is with the help of current agriculture teachers that we are able to offer this high-quality learning experience. We encourage other programs and schools to continue to look for ways you can work with preservice teachers to better prepare them for a career as an agricultural education profession. How can you invest in developing exceptional agricultural education professionals?



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Reflections on Professional Development: Keep an Open Mind

by Candis Carraway

As I ponder what wisdom I have to share with agriculture teachers about professional development, I find myself reflecting on my own experiences as an agriculture teacher. I can vividly remember the agony of sitting through days of in-service trainings mandated by my school district and wondering how I would be able to use anything being discussed. I remember keeping myself entertained by writing poems about what everyone seemed to be doing during those sessions – everything from coloring in a child’s coloring book to keeping a written account of all the grammatical mistakes the presenter makes. I remember one poem which included a line that had something to do with in-service being a “waste of time and the tax payers’ dime.” At some point in every teacher’s career I am sure they have this same experience at least once, but is professional development really a waste of your time?

I will confidently answer “NO!” to this question. Although we may experience a workshop, in-service day, or presentation or two which do not seem to be pertinent to our situation, we can all benefit from professional development. As teachers we push our students to have an open mind to learn new information and hone their skills in various areas and as teachers we should do the same.

Probably the most obvious benefit of professional development is the acquisition of new skills or knowledge which you as a teacher can implement in your own classroom. These could be new strategies for teaching students, a new technology that will help you manage your

program, or a very specific skill you need to master. The skills and information offered through professional development are just as varied as the methods of presenting them and the people who attend them. The truth is all agriculture teachers are unique and have different strengths and weaknesses. I challenge you to do a little self-reflection and really identify your strengths and weaknesses as an agriculture teacher. Those areas of weakness are the areas in which you should be seeking to improve.

Through the years I have discovered the workshops I usually “choose” to attend versus the ones I am “forced” to attend result in a better outcome. By seeking out professional development opportunities you are being proactive and taking control of your own professional development experience. Where can you find these opportunities?

A great place to start is with your state’s agricultural education association most of which offer some form of professional development workshops or conference. You could also contact universities who offer agricultural education as a major. Most of these universities host a variety of professional development opportunities and some may even count as college credit you could use to achieve an advanced degree.

For more specific skill obtainment opportunities I would advise you to explore opportunities available through those industries. For example, I know several ag teachers, considered very proficient agricultural mechanics teachers, who wanted to advance their own knowledge and skills, so last summer they attended a Commercial Diving and Industrial Inspection seminar conducted by The

Ocean Corporation. They expanded their breadth of knowledge to include underwater welding. If you teach animal science classes perhaps you could attend a nutrition seminar hosted by a feed company. Floral design teachers might consider attending a trade show for florists. Every industry within agriculture provides some opportunities to teach other people about their industry.

Another avenue you may want to explore is participating in “field days”, tours, or study abroad/away in which you are able to visit production agriculture operations. This gives you a chance to witness first-hand what happens and to visit with professionals in the field. I know it was much easier for me to teach my students about international agricultural after I had actually spent some time in another country learning about agriculture and the policies and procedures they face. Being able to show my students actual pictures of sugar cane being processed at a plant in Costa Rica or being able to tell them about my experiences and what I learned was much more effective than reading about international agriculture from a text book. These experiences don’t have to take place in another country, in fact they could even take place in your own county. If you are not familiar with an aspect of agriculture that is prevalent in your county seek out a producer and ask them to show you what they do. When searching for professional development opportunities you may be surprised by what you find and how impactful to your teaching it actually can be.

There is a less obvious advantage to attending professional development sessions that I believe is equally as important and that is networking with likeminded professionals.

Whether these are other teachers or other agricultural professionals we should take the chance to build our professional networks whenever we can. During the snack break visit with teachers sitting across from you and ask them about what works for them in their classrooms. I know I have discovered some of my best strategies by simply talking to other teachers. Share some of your challenges with a teacher during lunch and ask for advice. You will likely hear he/she has or had that same struggle; it always feels better knowing you are not the only one having problems. Through 20 years of attending numerous and varied professional development sessions, I have built a large network of people throughout the state, across the nation and even around the world. When I have a question or a problem

related to teaching or agriculture I recall all the people I have met and make contact with someone who can help. I have even been able to utilize this network of people for some “personal” advice such as when vacationing.

No, professional development is not a waste of time, it is important. We should all keep an open mind and look for opportunities to grow professionally. We can even find positive outcomes during those “non-effective” sessions if we try. I know I was never more mentally prepared to be “the teacher” after being “the student” for three days. I also was able to bond and make a great connection with the English teacher when I shared my poem with her and she showed me all the grammatical errors she noted throughout the day.



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teachers to design a meaningful early field experience placement. This ensures students get early clinical practice before student teaching. This will hopefully lead to a balanced teacher candidate; one who knows educational theory and philosophy, but can also apply it correctly.

Balanced

Educational theory and philosophy are an integral part of the TTU Agricultural Education program. Equally important is the opportunity for students to apply those in a real-world setting. Observations are heavily utilized early in the program in order to draw connections between theory and practice. Then early clinical opportunities are presented. Students teach lessons at local high schools, develop workshops for FFA Field Days, or assist with the preparation of local CDE/LDE teams. Students are charged to reflect after each

experience and reference relevant theories or philosophies. I am hopeful that this will lead to a balanced teacher candidate once they reach the Residency component of their program (I’m still a rookie, so it will be a couple of years before students have worked their way through program).

As a rookie teacher educator, I am sure I will make mistakes and I am fine with that. However, this is why I am in constant contact with our Office of Teacher Education. I want to ensure the risks my students and I take will allow for them to stay on track, and that they are developing the appropriate dispositions required for Residency placement.

Change Lives... Teach Ag!



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Raising a Barn: Creating an Agricultural Exhibit in an Urban Children's Museum

by Nora Thompson and Betsy Diamant-Cohen

Baltimore is filled with historic sites, museums, a world-class symphony orchestra, and family-friendly activities. However, in 2015, the Johns Hopkins Center for a Livable Future in collaboration with the Baltimore Food Policy Initiative found that one in four city residents lives over a quarter mile away from a grocery store. Like all cities, there are pockets of high-crime and impoverished neighborhoods; 32.2% of Baltimore children live in poverty. Since many city residents don't have cars and public transportation is limited, access to healthy foods is complicated. Although Baltimore City children are gaining better access to farm products via mobile food trucks and pop-up farmer's markets, many are unfamiliar with farms and agriculture. Hence, Port Discovery Children's Museum partnered with the agriculture community to develop *Here We Grow!* – an exhibit designed to engage children and families in hands-on learning about agriculture.

Port Discovery strives to address the community's educational needs. Our "Healthy Families, Healthy Communities Initiative" connects children and their families with education, resources, and opportunities that support healthy living. Because we are in the heart of an urban area, we decided to offer an exhibit about agriculture because it dovetails nicely with the Museum's healthy living messaging.

Until recently, Port Discovery had a small, heavily-trafficked farm and harvest exhibit. Down on the Farm simulated the outdoor world as children harvested vegetables, operated a silo, groomed a horse's tail,

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and milked a cow. The exhibit's popularity demonstrated visitors' interest in animals and agriculture related activities. When we approached local agriculture-affiliated groups about refurbishing and expanding this exhibit, they were excited to help educate our visitors about farming.

Due to technological changes, the traditional farmer's role has expanded. Maryland farmers wanted children to experience the diversity of agricultural jobs, countering the myth that farmers simply wear overalls and ride on tractors. Therefore, the scope of *Here We Grow!* was expanded well beyond that of our former farm and harvest exhibit. It was designed to introduce children to the role of agriculture in their lives, relating it to what they use, play with, eat, and wear. Visitors would learn about farming in Maryland, farm foods and animals, and how farm products journey from fields to homes.

Going to the Source: Meeting our Constituents

We collaborated with an active agricultural network involving the Maryland Agricultural Education Foundation, Maryland Grain Producers Utilization Board, Maryland Egg Council, Mid-Atlantic Dairy Association, Maryland Dairy Industry Association, Maryland Soybean Association, and the Baltimore County Center for Maryland Agriculture. This collaboration enabled pooled resources while helping to forward these organizations' institutional missions. Thus, an Agriculture Advisory Committee was established with representatives from these groups, as well as Baltimore City Health Department, University of Maryland Extension, Baltimore County Public Schools, Baltimore City Public Schools, and the Wright Family Foundation.

We applied for and received Institute of Museum and Library Services funding to maximize what had been received by other generous donors and create an all-new, significantly more robust, educational agriculture exhibit.

The Process

A Museum Education Advisory Council was convened. The Council adopted a community-needs perspective to create a relevant and developmentally-appropriate exhibit for children and families.

The Museum's Health Advisory Council advocated for the exhibit's relevance from a public health standpoint. This advocacy resulted in a partnership with the University of Maryland, School of Medicine, to form an after-school enrichment program on health topics like nutrition and exercise, giving students opportunities to meet healthcare professionals and learn the value of eating healthy foods. The Agriculture Advisory Committee continued providing insider knowledge on the workings of agriculture in Maryland, supplying educational content and partners. One partner sent three Port Discovery staff members to the "Agriculture in the Classroom" conference.

The Maryland Book Bank provided books for the exhibit's reading area, and The National Federation for the Blind made accessibility recommendations. Port Discovery staff were trained in evaluation techniques by Smithsonian Center for Learning and Digital Access personnel. Training aided efforts in 1) establishing targeted outcomes for the exhibit; 2) defining our approaches to formative evaluation emphasizing messaging and educational value; and 3) strategizing summative evaluation.

Growing Success: Prototyping

While planning, potential exhibit pieces were categorized for age-appropriateness, relevant Common Core Standards, Next Generation Science Standards, Maryland Model of School Readiness indicators, Bright Beginnings indicators, 21st century skills, and appropriate universal design categories. Once all plans were vetted, the Museum's Exhibits Department designed prototypes that were tested by visitors. Both the Exhibits and Education Department staff observed these interactions and analyzed them, developing recommendations for improvements and final designs. Some farmers and stakeholders were also invited to participate; they made valuable suggestions for improvements to signage and descriptions of agricultural processes.

Bringing the Project to Fruition

Five firms were given the opportunity to bid on exhibit fabrication. Heartland Scenic Studios submitted shop drawings and developed construction details for the bid. Heartland was awarded the project.

Programming the Exhibit

Here We Grow! helps visitors see the interconnectedness of agriculture with everyday life as they experiment with replicating real-world settings. Lesson plans on three developmental levels include pre- and post-visit activities, a teacher observation sheet to document children's interests to further explore in the classroom, exhibit descriptions, and book lists. To promote and enrich the exhibit, "Down on the Farm Days" incorporate special guests, such as live farm animals, an urban farmer, composters, Bee Keepers Association of Maryland, and 4-H groups.

The Power of Partners

As the project grew, so did our network of partners. They have been valuable resources who have left

their marks on the exhibit. A Maryland Agricultural Education Foundation committee member reviewed the lesson guides and donated dolls modeling agriculture-related activities, which are also incorporated into the exhibit.

And the network continues to grow. Launching the exhibit has introduced us to local heroes, such as Ulysses Archie from the Baltimore Gift Economy. Ulysses visits the Museum to tell Port Discovery visitors about his urban farms that gift locally farmed food to Baltimore City residents who in turn pass the gift on by sharing their time, skills, or other resources with others. Here We Grow! honors the agricultural history of Baltimore while supporting children's classroom learning across several curriculum subjects, offering opportunities for intergenerational learning, and sharing knowledge that builds healthy communities.

The Five Exhibit Areas

In Agriculture through History, visitors "meet" a variety of Maryland farmers, an equine veterinarian, and a member of the Garret County Farm Quilt Association.

Agriculture through Local Ecology introduces the effects of weather on crop growth, spotlighting the Chesapeake Bay, farmer's markets, and a map of fresh food markets in Baltimore City.

Agriculture through Science and Technology demonstrates the effect of technology on production in the egg and dairy industries, and animal healthcare in veterinarians' offices.

Agriculture Perceived through Art explores cultural celebrations influenced by agrarian cultures of the past and present through music, art, and dance.

Agriculture through Global Economy highlights Maryland's

global import and export system of meat, wheat, soybean, and corn.

Conclusion: Time for the Harvest

Here We Grow! started with the seed of an idea. With our agricultural partners' contributions, we were able to fertilize the idea and help it grow. As a result of developing this exhibit, we have strengthened our role as a community resource and fostered a partnership with Maryland's agricultural network. We learned new ways to address the needs of our community's children and families. We furthered our role as educators and disseminators, affirming Port Discovery as a community hub that brings individuals and organizations together. Most importantly, we learned that working with unlikely partners creates magnificent results.

Here We Grow! was made possible in part by Institute of Museum and Library Services and was locally sponsored by M&T Bank. Here We Grow! was also made possible by generous support from: Maryland Grain Producers Utilization Board, Wright Family Foundation, Maryland Agricultural Education Foundation, Inc., Maryland Egg Council, Inc., Maryland Soybean Board, Mid-Atlantic Dairy Association, Maryland Dairy Industry Association, Inc., Maryland Agriculture Resource Council, Inc., Dairy Farmers of America, Maryland and Virginia Milk Producers Cooperative Association.



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Agricultural Literacy, Integrated STEM, and Innovative Technology: An Engaging Combination

by Farah L. Vallera and Alec M. Bodzin

I always hope my students embrace what they're learning wholeheartedly because they trust what I'm telling them will enrich their lives. Perhaps I'm biased, but being literate in science, technology, engineering, and math [STEM], as well as agriculture does enrich life, through 21st century job preparation, health and consumer choices, environmental conscientiousness, and even the understanding of our future global landscape. However, it's no secret that today's digital learners demand instant feedback and engagement in their classroom materials, and the "business-as-usual" approach to teaching and learning using adopted, standardized curricula and textbooks is no longer working. Large-scale curriculum reform initiatives designed to increase STEM literacy are rapidly appearing nationwide. Is there a way to engage these digital learners in their learning processes using innovative technology and integrated curricula to increase their literacy in these subjects? We think there is.

Innovative Instructional Technology and Project-Based Learning

Student use of innovative instructional technologies, can increase student understanding, motivation, and success (Barab & Luehmann, 2003). Combining technology with authentic project-based learning challenges using real-world examples can provide students with enhanced understandings of complex, abstract

concepts. Project-based learning encourages students to investigate problems or challenges using their own curiosity to find solutions. Providing authentic, project-based performance tasks that scientists, technologists, engineers, or mathematicians may encounter in their lives can inspire critical thinking, communication, creativity, and collaboration and get students excited about learning by making content-based learning more interactive (Hsu, 2004).

To accomplish this, we developed STEM-integrated agricultural lessons, formative and summative assessments, and project-based performance tasks in an iBook that could be accessed with an iPad. The two-week curriculum focused students on the driving question, "How will you help Farmer Kathy prepare for the farmers' market?" Students learned about and experienced agriculture through video lessons from Farmer Kathy's farm, hands-on tasks that involved food and fiber manipulations and by-product production, and acted as farmers while applying their knowledge to authentic situations.

The AgLIT Module

The Agricultural Literacy through Innovative Technology [AgLIT], integrated STEM subjects around agriculture to provide upper-elementary students with authentic experiences. The module was aligned to Next Generation Science Standards, Common Core Math Standards, National Agricultural Literacy Outcomes, and the Food and Fiber Systems Literacy Framework. Three instruments measured each of those specific elements of literacy. Students' knowledge of STEM and agriculture was assessed with the KnowASTE assessment, their 21st century skills were evaluated with a culminating project-based

performance task, and their attitudes/beliefs were measured with the ThinkASTE instrument.

AgLIT was disseminated and tested in a large urban elementary school in the northeastern U.S. by two fourth-grade teachers who received on-the-farm training to use the module. The findings from the students' scores in pretest and post-test knowledge and attitudes/beliefs instruments were compared to those students in a control group that received regular classroom instruction from their standardized, adopted curriculum. The study revealed that students who used the AgLIT curriculum had significantly higher scores on the knowledge assessment and the attitudes measure compared to the students who used the school's business-as-usual curriculum. In addition, scores on a culminating AgLIT performance task revealed that most students (88.1%) performed important STEM skills at exemplary or proficient levels. We believe that the student use of the innovative technologies had a great deal to do with these successes.

The Innovative Technological Tasks

The use of instructional technology immediately gained students' interest and attention and appeared to enhance their experiences with STEM and agriculture. Students were excited by the innovation and interactivity of the module's technological complexity and its applicability to their digitally driven lives. The AgLIT module included Web GIS, Google Earth, augmented reality, presentation design, and data analysis activities and background content. These curriculum materials were presented and used by students in an iBook.

The first task on the first day had students analyze historical data about U.S. farms and make predictions about the future of farming in their state. Using Web GIS they explored historical Census data from 1850, 1900, 1950, 2000, and 2010 and analyzed changes over time of the number of farms per state, the percentage of farmland in each state, the average number of acres per farm, and the dollars of all the agricultural output produced by each state (see Figure 1). Students quickly learned how to navigate through the Web GIS program; however, their lack of geographic knowledge impacted their success on their learning task sheet. For example, when asked to identify the area of the country that had the smallest number of farms in 1900 (the answer was “Midwest”), students were unclear how to answer.

The second technology task on

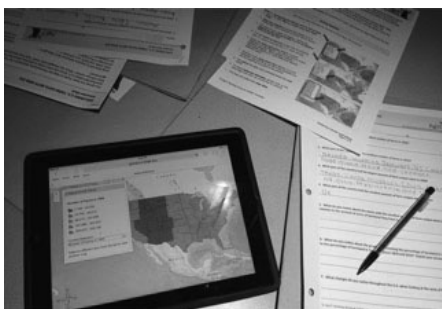


Figure 1

the second day was designed to help students better understand how food is produced, processed, and distributed around the country and the world. Using their iPads, students learned about the ingredients of pepperoni pizza by activating videos in Aurasma, an augmented reality program, and then mapping their travels to a local pizza shop using MapQuest. Students scanned images of eight ingredients with the iPad’s camera to learn about the production and distribution processes and then mapped the locations to determine the distance of each ingredient’s trip.

An engineering task, which took place on the third day, required that

students build a garden somewhere on the farm that could produce enough fruits/vegetables to sell at the farmers’ market. Students had to decide what to grow, where to grow it, and how they would set up their gardens. Equipped with a produce guide from the state college’s Cooperative Extension, students selected their produce to grow (see Figure 2). Then, using Google Earth, they explored the farm – activating layers representing different animals, water sources, tractor fuel, and the manure pile – and chose appropriate locations to build their gardens (i.e., away from animals, close to water, near paths for the tractor, etc.). Finally, they drafted their garden layouts – identifying raised garden beds, rows, or sections labeled for specific produce – and outlined the steps they would take to grow their produce.

The culminating task was di-

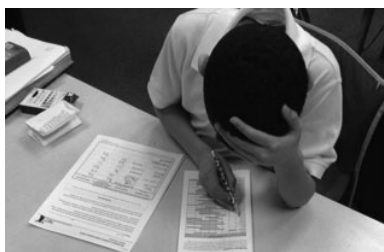


Figure 2

vided into two parts, integrated all STEM subjects, and took place on the eighth and ninth days of the unit. In the first part, students mathematically analyzed market trends to determine how much they would charge customers for their products at the farmers’ market, chose the products they would sell (see Figure 3), and then created a virtual brochure of



Figure 3

their goods for sale using the “Haiku Deck” application. The second part involved outlining their business’s goals, target market, and advertising strategies. Students had to reflect on their performance throughout the entire module and self-assess what their business’s strengths and weaknesses were before designing a model of their future farm stand. On the final day of the unit, students presented their virtual brochures and farm stand models to a visiting farmer from the farm they had studied (see Figure 4).

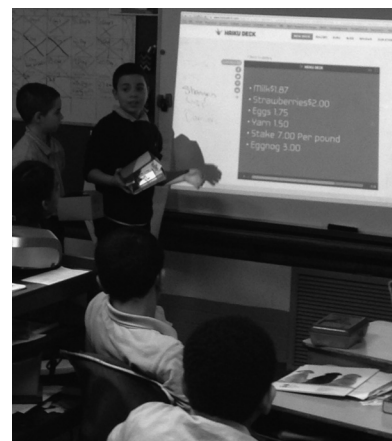


Figure 4

Engaging Students

While the research goals and outcomes from the project indicated great success, there were still some pitfalls that we experienced. The main technology tasks were completed during the first two days of implementation when the technology was novel and students were excited to be participating in the curriculum. At times, the students’ enthusiasm took away from some of the instruction and project time, and the number of “selfies” they took on the iPads was quite substantial. As the days passed, however, students became more and more engaged in the learning activities and focused their efforts on completing the tasks efficiently and creatively. The technology kept the students engaged, interested, and motivated allowing students to gain valuable skills that appealed to them as digital learners. Students enjoyed

this novel approach to teaching and learning. It wasn't hard to get kids to stand on chairs to get a better look, laugh while learning important lessons about engineering design and the iterative process, and present their understandings with pride in front of the farmer. Learning was obviously fun.

Hassanien (2006) noted that "technology alone does not guarantee solutions to educational problems" (p. 42) even though it enriches the learning environment. Many of the barriers to implementing technology-driven, project-based learning strategies in coursework, such as time, training, and costs were minimized here by planning through any anticipated problems and misconceptions prior to the implementation of the module. The performance tasks provided students with enough freedom to take ownership of their learning, while also providing teachers with information and supports to scaffold them when necessary. Instructional materials for both students and teachers modeled the technology and activities they would encounter so the novelty of the activity and technology did not turn into a hindrance.

We hope these students can confidently participate in conversations regarding the origins of their foods and fibers and how the production processes relate to their lives. One student wrote:

*Thank you for giving me and my class wonderful agriculture lessons! My favorite lesson that I did with you is the one where we got to make our very own farmers market and also got to make the little online book thingy. Thank you for helping me learn about agriculture.
P.S. all of the lessons you gave me were the most funnest time of my life!
[sic]*

Back Cover: Photos of teachers participating in professional development.

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While it would be nice to believe that what this young lady learned was in fact the most fun she'd ever had in her whole life, it is clear she simply enjoyed the projects and truly learned from the experiences.

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