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**Poster Chair:**

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**Acknowledgements:**

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A total of 83 posters were received, 43 in the Innovative Idea category and 40 in the Research category. There were 28 Innovative Idea posters accepted (65% acceptance rate) and 25 Research posters accepted (63% acceptance rate).

**Reviewers:**

The following individuals generously donated their time to review poster abstracts. Without their commitment, the poster session would not be possible.

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Suarez, Cecilia	University of Florida
Warner, Wendy	North Carolina State University
Wells, Trent	Iowa State University

## **Innovative Idea**

**#ChemicalAwareState: Farm safety goes social**

Carla Jagger, Tobin Redwine, Sharon Wagner, Emily Berger, and Holli Leggette

Mississippi State University and Texas A&M University

**[University] Agriscience Education Immersion Experience: An Exploratory Program for the Promotion and Improvement of Future Agriscience Teachers**

Chris Clemons, Ph.D.

Auburn University

**“I am Different, Not Less”: Illustrating Strengths-Based Leadership Through the Lens of Temple Grandin**

Haley Rosson, Penny Pennington Weeks

Oklahoma State University

**A Faculty Development Project: Creating a Community of Global Thinking Fellows**

Christopher T. Stripling, Nicole Stedman, James R. Lindner, Amy Harder, Robert Strong, T. Grady Roberts, Kim Dooley, and Lisa Lundy

The University of Tennessee

**A Variable Frequency Drive Trainer for STEM Integration in Agricultural Mechanics**

Colton Teekell, Patterson Hilaire, Donald Johnson

University of Arkansas

**An intra-curricular approach in assisting underserved populations: Engaging the community in student development**

Brooke N. Griggeory, Dr. Stacy K Vincent, Dr. Carol D. Hanley, Dr. Dan W. Kahl

University of Kentucky

**Award Points Program: Utilization of Google Sheets™ Pivot Tables for Student Awards Points and Required FFA Activity Credits**

Kathryn Teixeira, Dr. Shane Robinson

Oklahoma State University

**Creating Student Empowerment and Inclusion for Underserved Youth in Agriculture**

Mr. Elijah Parham & Dr. Stacy K. Vincent

University of Kentucky

**Critical Conversations: Using a Video Podcast to Engage**

Catherine W. Shoulders, Marshall A. Baker,

University of Arkansas,

## **Innovative Idea**

### **Teachers in Philosophical Discussions about Agricultural Education**

Brian E. Myers

Oklahoma State University,  
University of Florida

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Megan Stein, Summer Odom, Barry Boyd,  
Kelly Essler, Julie Harlin, Lori Moore

Texas A&M University

### **Early Field Observations: An in-depth approach of career exploration Introduction**

Christopher Eck, Kathryn L Teixeira, and  
Dr. Robert Terry Jr.

Oklahoma State University

### **Educating First Responders to Assist in an Agricultural Hazardous Situation**

Ms. Sarah D. Warren, Dr. Stacy K. Vincent,  
Dr. Joan Mazur, & Mr. Dale Dobson

University of Kentucky

### **Enabling Agriculture Teacher Candidate Preparation with Technology and Resources**

Victoria P. Whitley, Travis D. Park, Kevin  
W. Curry Jr., Wendy J. Warner, Joy E.  
Morgan

North Carolina State  
University

### **Filling Buckets for Our Beginning Ag Teachers**

Joy E. Morgan, Travis D. Park, Wendy J.  
Warner

North Carolina State  
University

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Whitney L. Figland; J. Joey Blackburn

Louisiana State University

### **Grip and Grin: An innovative approach to incorporating advisory committee members into SAE instruction**

Sarah E. LaRose, John D. Farrell, & Andrew  
C. Thoron

University of Florida &  
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### **In a SNAP: Nutrition Education in Food Desert Communities**

Ms. Eliza Green, Mrs. Kendall M. Wright,  
Dr. Stacy K. Vincent, Ms. Jacqueline  
Corum, Mrs. Becca Self

University of Kentucky

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Kylie Ehlers, Isabel Whitehead, and  
Jefferson Miller

University of Arkansas

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Randy Lund, Jenna Gilbert, Tim Murphy

Texas A&M University

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Samantha Blackwell & Shelly Sitton

Oklahoma State University

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Brianna Shanholtzer, Dr. Andrew Thoron, Dr. J.C. Bunch

University of Florida

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Lee Thomsen, Sarah Warren, and Dr. Rebekah B. Epps

The University of Kentucky

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Travis D. Park, Joy E. Morgan, Mary Kate Morgan, Wendy J. Warner

North Carolina State University

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Anna J. Warner, Catherine W. Shoulders, Marshall A. Baker, Brian E. Myers

University of Florida, University of Arkansas, Oklahoma State University

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Rachael Blackwell, Trent Wells, & OP McCubbins

Tennessee Tech University & Iowa State University

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Olivia Caillouet, Catherine Dobbins, Kathleen S. Jogan, Leslie D. Edgar

University of Arkansas

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Blake Colclasure & Keith Schiebel

University of Florida

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Kayla Jennings, Lindsay Kennedy, and Dr. Cindy Akers

Texas Tech University

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Olivia Caillouet, Catherine Dobbins, Leslie D. Edgar, Don W. Edgar

University of Arkansas

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Marshall Swafford

Eastern New Mexico University

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Matt Benge, Matthew Sowcik, Jera Niewoehner-Green

University of Florida,  
University of Florida, Ohio  
State University

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Jefferson Miller and Olivia Norton

University of Arkansas

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Chris Clemons, Ph.D., Trent Wells

Auburn University

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Isabel Whitehead, Leslie D. Edgar, Don. W. Edgar

University of Arkansas

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Clemson University,  
University of Florida

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Brittany Bowman, Quisto Settle, Elizabeth Gregory North, Keri Collins Lewis

Oklahoma State University,  
Mississippi State  
University

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University of Arkansas

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Virginia Tech

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Krista Courter, Whitney L. Figland, J. Joey Blackburn, Kristin S. Stair, H. Eric Smith

Louisiana State University

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Jeremy Elliott-Engel & Dr. Donna Westfall-Rudd

Virginia Polytechnic  
Institute & State University

## **Innovative Idea**

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<b>Outcomes of a state-wide service learning and leadership experience for agriculture students</b>	Tobin Redwine	Texas A&M University
<b>Perceived Factors that Influence the Success of Vertical Transfer Students in Agricultural Education</b>	Tera Howerton and Chris Clemons	Auburn University
<b>Promoting Innovation and Team Performance Through Cognitive Diversity: A case of Extension Agents in Morogoro-Tanzania</b>	Asha Shayo, Rick Rudd, Amon Mattee	Virginia Tech, Sokoine University of Agriculture
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<b>Student Preparedness: College Ready or Career Ready?</b>	Victoria C. Willis, Catherine A. DiBenedetto, Brian E. Myers	Clemson University, University of Florida
<b>Students' perceptions of workforce readiness compared to industry expectations</b>	Rachel E. Hendrix and Carley C. Morrison	Mississippi State University
<b>Teacher Perception of the [State] Middle School Agricultural Education Curriculum and its Relationship to Secondary Agricultural Education Enrollment.</b>	David Chapman; James Lindner	Auburn University
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<b>Use and Perceptions of Varroa Control Practices Among Florida Backyard Beekeepers</b>	Mary Bammer, Amanda Ali, Austin Council, Sebastian Galindo	University of Florida

**Innovative Idea**

**Where's the Expert? Understanding the Expertise Gap  
in Preservice Agricultural Education Teachers**

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Site hosted by [Peak Consulting](#). Questions about the site can be addressed to [mspiess@csuchico.edu](mailto:mspiess@csuchico.edu)



**#ChemicalAwareState: Farm safety goes social**

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**#ChemicalAwareState: Farm safety goes social**

**Introduction**

Teaching farm safety is a paramount challenge for agricultural educators. The National Institute for Occupational Safety and Health (NIOSH, 2014) reported that work-related injuries led to a fatality rate of 20.2 deaths per 100,000 farm workers in 2012. In response to the prevalence of work-related deaths in agriculture, the National Occupational Research Agenda (NORA) Agriculture, Forestry, and Fishing (AgFF) Sector Council revised its national agenda in 2016. Goal five of the new agenda addresses farm health. Intermediate goal 5.03 specifically relates to farm chemicals including pesticides, and chemicals are implicitly linked to each sub goal in goal five (NORA AgFF, 2016). Secondary agricultural educators in Mississippi have echoed the desire for safer practices involving farm chemicals (C. Jagger, personal communication, May 23, 2017). In a convenience sample of the agricultural educators, 43.5 percent indicated they would like to receive information on safe farm chemical use. Delivering farm safety content is straightforward, but meeting complex information consumption needs is more challenging.

Social media outlets have taken an increasingly important role in millennial information consumption (Hirst & Treadwell, 2011), and in higher education classrooms (Tess, 2013). Social media—including Twitter, Instagram, Facebook, and other outlets—offer an innovative way to engage targeted audiences. If social media is an innovative way to engage audiences about a specific topic, and there is a need for greater engagement and outreach regarding farm chemical safety in Mississippi, then how can agricultural educators and communicators get farm safety to go social?

To meet this challenge, this team of agricultural educators and communicators coalesced around an innovative idea: creating and disseminating chemical farm safety curricula in both classroom and social media spheres.

The purpose for this project was to create a social media campaign that high school agriscience teachers could use during National Farm Safety Week. Goals of this project included delivering sequenced lessons for one week of content to agriscience teachers, developing social media posts to incorporate with the sequenced lessons, and tracking use of social media during National Farm Safety Week.

**How it Works**

Our team split up into two groups and began gathering pertinent information related to chemical safety. One subset of our team focused on developing lesson plan topics and content and communicated those ideas with the other half of our team who focused on curating and creating social media content to correspond with the lesson plans. During the development of the lesson plans and social media posts, we chose hashtags, created a logo, and wrote a feature story.

We created, designed, and curated social media content for three platforms—Twitter, Instagram, and Facebook—which included one post per day per platform for Southeast Center for Agricultural Health and Injury Prevention (SCAHIP) to post as part of National Farm Safety

Week (September 17 to 23). In addition, we contacted agricultural businesses and opinion leaders (e.g. Tom Farms, Mississippi Farm Bureau) with social media presence to ask them to share the content the Center posted. In total, we contacted 33 businesses or organizations to inform them about the campaign and seek their participation. Including the Center, nine organizations agreed to participate in disseminating the social media content and four organizations participated.

### Results to Date

The content created for this campaign had a potential reach of 46,871 social media users, not including public engagement. Admittedly, much of that potential engagement was not reached, either because of underuse of the content created or because of under promotion or sharing of content. For example, although we created 21 unique posts for three distinct media platforms, the Center only posted 10 unique posts. Social media contest participation (Instagram photo contest and Twitter 'Dad Joke' contest) was not promoted widely and did not generate the entries needed for content re-use. Despite these potential pitfalls, the campaign did generate noticeable social media impact. By the end of the week-long campaign, the content had generated 712 likes across three social media platforms (Instagram n=680, Facebook n=26; Twitter n= 12).

We emailed a digital .pdf book of lesson plans and instructional materials to 144 agriscience teachers in Mississippi. Because the actual use of provided materials was unmeasurable, we sent a feedback questionnaire to the same group of agriscience teachers. The teachers provided minimal feedback, but those who responded indicated they would consider using the materials again in the future and, if another campaign is launched next year for National Farm Safety Week, they would be likely to use the provided materials. The agriscience teachers' feedback also indicated that they used portions of the weekly content but did not use the entire series.

### Advice to Others

This partnership was valuable in disseminating information about farm chemical safety. Partnering organizations indicated they were willing and interested in distributing information, but follow-ups are important for maintaining buy-in. Instagram content generated the most likes; therefore, we recommend the use of Instagram as a starting place for disseminating scientific information. We recognize our content may have garnered more likes on Instagram as a function of the number of Instagram followers the accounts had, as opposed to the nature of the content, so future research should investigate the nature of Instagram user engagement with educational information.

### Costs

The Southeast Center for Agricultural Health and Injury Prevention provided \$7005 for the completion of the project. We used a large part of the funds for graduate student stipends, freelance contracts, and travel. We contracted two freelance consultants—one to create the campaign logo and one to write a feature story highlighting a Mississippi producer. However, the project could have been completed with minimal to no monetary costs as the curation and creation of social media content and lesson plans simply took time to produce.

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Auburn University Agriscience Education Immersion Experience: An Exploratory Program for  
the Promotion and Improvement of Future Agriscience Teachers

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## **Auburn University Agriscience Education Immersion Experience: An Exploratory Program for the Promotion and Improvement of Future Agriscience Teachers**

### **Introduction and Need**

Innovation in the recruitment of potential teacher candidates is paramount for the continued livelihood of our profession. In 2016, state programs identified 721 (Smith, Lawver, & Foster, 2016) open agriculture education positions at the secondary level, while post-secondary programs strive to educate enough candidates to fill these positions. Post-secondary Agriculture Education programs have historically experienced enrollment, funding, and certification difficulties for future teachers (Smith, Lawver, & Foster, 2016). Auburn University has developed and initiated a summer immersion opportunity for the enhancement of personal development, leadership skill building, and recreational activities (Connors, Falk, & Epps, 2010) known as the Auburn University Agriscience Immersion Experience. This experience enables twelve schools to identify five potential students each to participate in a two-day teaching experience for the promotion of agriculture education. Four opportunities are held each summer with three schools participating in each program. This innovative program addresses Research Priority 5, “*How can quality agricultural leadership, education, and communication educational programs be delivered in a cost-effective manner?*” (Thoron, Myers, & Barrick, 2016, p. 43).

### **How it Works**

*Day one* activities include immersion within the equine sciences, beef evaluation and management, poultry science and production, greenhouse management, production, and business operations, meat processing and evaluation, and veterinary science applications. *Day two* participants engage with Auburn University faculty to practice methods of instruction, classroom management, and the development of their teaching demonstrations utilizing the experience from the day one activities. Collaborative learning and experience is gained through student’s interaction with professors and faculty at each of the facilities. Each immersion activity concludes with a panel discussion with new teachers, financial aid professionals, and admissions counselors. The development and implementation of this program relies on support from the Auburn University Agriscience Program, College of Agricultural Science, Auburn University Veterinary College, and the College of Education. Alabama high school agriscience programs are eligible to participate in the two-day immersion programs. Each high school program completes an application and faculty and staff at Auburn University review the applications to determine acceptance. Once accepted, the secondary program agrees to participate and provides information regarding their students interest in becoming an agriscience teacher. This interest approach provides a means for tailoring a school’s experience to meet the needs and interest of the prospective teaching candidates. A registration of \$50.00 per participant (\$250.00/school) is collected in advance which provides funding for materials, lunch, subsidy for overnight accommodations, and t-shirt. The innovation of this activity, beyond the immersion experience, provides high school students the opportunity for reflection and conversation with Auburn University faculty. This discussion time provides insight from students interested in agriscience education for faculty to tailor future programs and programmatic recruitment efforts.

### **Results to Date**

One pilot immersion program was completed during the summer of 2017 at Auburn University. One school and twelve participants experienced the immersion program and the

results were spectacular. Student participants expressed their excitement when asked about CDE experiences, teaching methods, and learning more in depth the requirements for being a successful agriculture teacher. Participants also were supportive of the overnight experience and the application of learned experiences in the agriculture mechanics laboratory. Teacher participants indicated their support and recommendation for broadening the program during the summer of 2018 and supplied their voice of support during statewide meetings. Auburn University faculty in the College of Agricultural Science supported the opportunity to share the benefits and successes of the college while demonstrating the authenticity of their individual programs and the need for agriscience teachers to have an understanding of the concepts and science applications. Faculty at the Auburn University College of Veterinary sciences have offered in-depth activities for future immersion experiences including; live surgeries, facilities management, and veterinary technologist experiences. The long-term outcomes of this opportunity will demonstrate if immersion opportunities for secondary students interested in agriscience education increase the enrollment, completion, and matriculation within our field.

### **Future Plans**

The future of this innovative program involves expanding the number of secondary schools to twelve increasing participation through the addition of four separate immersion opportunities at Auburn University. During the summer of 2018, 70 students will have the opportunity to engage in the application of teaching and learning while gaining additional educational opportunities. The future for this program includes incorporating advisor professional development to run concurrently with the student immersion activities, increasing the number of undergraduate agriscience majors involved in direct instruction, and new content areas for student activities. Ideally, the inclusion of agriscience learning kits, curriculum development, training CDE teams, and public relations will be added to the experience as well as the opportunity for a three-day experience. Plans to maintain growth will be accomplished by limiting participation to junior and senior students and no more than one attendance per lifetime. This conclusion is supported by Brown, Terry, and Kelsey (2014) who supported limiting attendance of participants to alleviate facility stress and accommodate more future teachers who to attend and the potential for repetitive activities and experiences. Promotion of this program will occur through the 2017-2018 school year and consist of a one hour workshop about the immersion experience during the 2017 Auburn University Greenhand Conference.

### **Costs**

Operating costs are offset by student registration being collected prior to each immersion experience. Four schools are involved in each immersion experience and thus generate a cost offset of \$1000.00/experience. Each participant is required, through their FFA program, to submit a \$50.00 registration fee to offset subsidized accommodation in Auburn, materials for activities, transportation between campus instructional units, and meals. Costs for this program vary between locations so approximate values are included for one immersion experience: Lodging for five students, \$450.00, meals, \$500.00, materials, \$350.00, transportation, \$100.00. Total net cost per immersion activity is \$1400.00, with \$1000.00 collected in registration fees, for a balance of \$400.00. Additionally, cost offsets from the College of Agricultural Sciences of (\$3000.00) and industry partnerships (\$5000.00) to reduce the financial burden.

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## **“I am Different, Not Less”: Illustrating Strengths-Based Leadership Through the Lens of Temple Grandin**

### **Introduction/Need for Innovation or Idea**

Numerous definitions abound for the concept of authentic leadership (Avolio & Gardner, 2005; Gardner, Avolio, Luthans, May, & Walumbwa, 2005; Northouse, 2010; Shamir & Eilam, 2005), a theory which is considered to be one of the newest areas of leadership research (Northouse, 2010). As the name suggests, the premise for becoming an authentic leader is to achieve authenticity, “through self-awareness, self-acceptance, and authentic actions and relationships” (Gardner et al., 2005, p. 345). An undergraduate agricultural leadership course at [state university] focuses on teaching authentic leadership development. A main objective for the course is for students to examine their strengths as they relate to authentic leadership by utilizing the Gallup Clifton StrengthsFinder® assessment and related strengths-based literature.

The film *Temple Grandin* is shown specifically to demonstrate strengths-based concepts. In an analysis of signature pedagogies most frequently used by leadership educators in a college setting, Jenkins (2008) proposed that media clips, (in the form of films, television, YouTube videos, etc.) are a viable instructional strategy. The film takes place in an agricultural context, thereby allowing students to effectively relate to the film’s setting. Throughout the facilitation of this course over the period of several years, students have expressed a keen interest and respect for Dr. Grandin and enjoy learning about her agricultural endeavors, as well as her promotion of autism awareness. Additionally, the film does an excellent job of emphasizing how Grandin plays to her strengths and is able to manage her weaknesses, rather than focus on them, which is one of the founding tenets of Buckingham and Clifton’s (2001) strengths-based philosophy.

### **How It Works/Methodology/Program Phases/Steps**

This series of activities was conducted in an undergraduate personal agricultural leadership development course at [university]. With the concept of authentic leadership serving as a foundational tenet for the course, a portion of the semester focuses on strengths development by utilizing the texts, *Now, Discover Your Strengths* (Buckingham & Clifton, 2001) and *StrengthsQuest* (Clifton, Anderson, & Schreiner, 2006). Students completed the Gallup Clifton StrengthsFinder® assessment and utilized their identified top five strengths to complete several course assignments. Various instructional strategies (Jenkins, 2012) were used to illustrate key course concepts: class discussion regarding chapter readings, a homework worksheet, a strengths debate, a review of each student’s signature themes report, and a reflective essay on each student’s top five strengths and the practical implications of the strengths approach.

Prior to viewing the film, the instructor taught two lessons on [*The anatomy of a strength*] and [*Discover[ing] the source of your strengths*] (Buckingham & Clifton, 2001). Students then spent two class periods watching the film and were instructed to identify scenes and direct quotes they believed best exemplified Dr. Grandin’s top five strengths (per the 34 themes identified in the Gallup Clifton StrengthsFinder® assessment). Students took notes and completed a worksheet where they were asked to provide two relevant examples for each strength and how the scene and/or quote from the film related to the strength as defined by the course textbook.

In the proceeding class meeting, students worked in groups to discuss the strengths they identified for Dr. Grandin to create a collective group list of strengths. Students debated and voted on a “top five” list of strengths for the entire class. Prior to the viewing of the film, an e-mail correspondence was established with Dr. Grandin to inquire if she had ever completed the StrengthsFinder® assessment. Dr. Grandin responded, stating that she had not completed the assessment before, but provided a list of what she believed to be her top five strengths based upon a review of the 34 signature themes. After identifying Dr. Grandin’s strengths collectively as a class, her “actual” strengths were revealed. At the conclusion of these activities, students completed an instructor-developed evaluation over the key concepts exhibited in the film.

### **Results to Date/Implications**

Thirty-eight students between the fall 2016 and spring 2017 semesters completed the evaluation survey. The survey consisted of nine questions, utilizing a five-point Likert-type scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree) to assess students’ level of agreement with statements regarding the use of the film in class. Additional open-ended questions related to the use of the film, as well as demographic questions, were also included.

Students were predominantly female ( $n = 26$ ) and consisted primarily of freshman and sophomores ( $n = 25$ ). Eleven majors were represented between the two sections, with the majority being agricultural education ( $n = 10$ ), agricultural leadership ( $n = 9$ ), or agricultural education/animal science double-majors ( $n = 7$ ). Half of the students ( $n = 19$ ) had seen the film prior to watching it in class.

The highest means reported were for the statements, “the movie was enjoyable,” ( $M = 4.74$ ,  $SD = .446$ ) and “the movie was a nice change of pace from lecture,” ( $M = 4.61$ ,  $SD = .547$ ). Students also agreed that “the movie made the concepts discussed in class seem more ‘real world,’” ( $M = 4.37$ ,  $SD = .786$ ), “was relevant to course content,” ( $M = 4.42$ ,  $SD = .758$ ), and that “seeing the leadership concepts portrayed in the movie reinforced the information more than if only learned in lecture,” ( $M = 4.26$ ,  $SD = .795$ ). In addition, students agreed that they were “clearly able to identify scenes in the movie that best exemplified Temple’s top five strengths,” ( $M = 4.18$ ,  $SD = .692$ ). All students agreed that they would recommend the use of this film to help emphasize leadership concepts in this class in the future ( $n = 38$ , 100.00%). When asked to share their thoughts about using the film *Temple Grandin* in class, very positive opinions were given. One student suggested that a recording of Dr. Grandin giving a lecture be shown in class to further illustrate key concepts and bridge the divide between real-life and film.

### **Future Plans/Advice to Others**

During the semester, several films, in addition to *Temple Grandin*, are used to analyze leaders such as Dan West, Katie Davis, and Alice Paul. Movies can provide an effective visual representation of the concepts portrayed during lecture, especially when presented within a context that is relevant to students, thereby generating increased levels of interest and engagement. By reviewing students’ evaluation surveys and exam essay responses, it appears students enjoy the film *Temple Grandin* and believe the film helps them to illustrate key course concepts. Additional movies and related experiential activities should continue to be explored for their applicability to key leadership concepts.

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**A Faculty Development Project: Creating a Community of Global Thinking Fellows**

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## **A Faculty Development Project: Creating a Community of Global Thinking Fellows**

### **Need for Innovation**

Tomorrow's graduates in agriculture will face challenges on a global scale. Preparing them to solve these problems must be a primary goal for colleges of agriculture (National Research Council, 2009). To do so, teaching faculty must be able to teach in a way that encourages and fosters critical thinking. In 2004, higher education associations and leaders of institutional accrediting bodies identified critical thinking as one of the six major intellectual and practical skills which students should possess after obtaining their undergraduate degree (AAC&U, 2007). However, Lauer (2005) indicated faculty expressed difficulty incorporating critical thinking skills into their courses. Moreover, Stedman and Adams (2012) found faculty are not generally knowledgeable about critical thinking. When asked to answer questions related to basic concepts and understanding of critical thinking, faculty often answered these questions incorrectly indicating a lack of knowledge about the concepts of critical thinking (Stedman & Adams, 2012). A gap exists in how faculty are able to teach for critical thinking when they are not knowledgeable about those basic concepts. This project was developed to expand the knowledge and abilities of faculty to implement explicit critical thinking instructional strategies, as well as assist them with challenging their students with complex global problems.

### **Program Phases**

This project provided instructional support for faculty through development and implementation of a Global Thinking Academy (GTA), a capstone international experience, and aiding faculty in the creation and use of scenario-based reusable learning objects (RLOs).

#### **Phase 1 – Global Thinking Academy Planning and Development**

During phase one, the project team developed modules on the following topic areas: (a) critical thinking, (b) teaching for critical thinking, (c) instructional design models, (d) scenario development, (e) digital media to enhance instruction, (f) teaching contentious subjects, (g) global food security and hunger, (h) teaching globally-relevant topics, and (i) using scenario-based RLOs to elicit critical thinking. The project team also worked with an international partner to plan the capstone international field experience and conducted a scouting trip to plan contextually appropriate experiences and make logistical arrangements. Furthermore, GTA Fellows or participants were recruited from the southern region of AAAS. A total of 18 GTA Fellows were selected through a review process conducted by the project team.

#### **Phase 2 – Global Thinking Academy and International Experience**

The GTA began with a face-to-face session and was used to establish expectations for the GTA Fellows and discuss the learning objectives of the academy. After the opening session, faculty returned home and began a 10-week program consisting of asynchronous modules. Each module was in the form of an interactive narrated presentation with supplemental material and assessments. Delivery of the modules was through the learning management system, Canvas. The culminating experience for the GTA Academy was a six-day international field experience to Belize to gather the contextual data (e.g., video, interviews) for developing the scenario-based RLOs. Project team members traveled with the participants during their international field

experience to facilitate their on-site learning and to provide support in capturing the global context for the scenario-based RLOs.

### **Phase 3 –Scenario-based RLO Development and Implementation**

Operationally, this project used the comprehensive and detailed process provided by Wilson and Ralston (2006) for developing and using scenarios. Scenarios are similar to case studies, but much more complex and include many more decision points. This provides a much more fertile foundation for developing and using critical thinking skills. GTA Fellows worked with the project team to develop the scenario-based RLOs. Once developed, the scenario-based RLOs were peer reviewed and posted on the Global Education Lab website for the GTA Fellows to use in their courses. Fellows are required to use three RLOs in a course they are teaching and are currently in the RLO implementation phase of this project.

### **Results to Date**

GTA Fellows mean score on the assessments for the academy modules was 84% with a minimum of 78% and a maximum of 87%. Fellows who scored below the predetermined proficient rate of 80% on individual modules were asked to review the module(s) again and retake the assessment until 80% was obtained on each module. Furthermore, initial analysis of qualitative data suggested GTA Fellows believed the academy modules were beneficial and challenging. Fellows noted the modules required them to think in a higher-order manner. The GTA Fellows also indicated they enjoyed the international experience and have gained a greater understanding of critical thinking instructional strategies as a result of the GTA. However, a few GTA Fellows felt they did not have adequate opportunities to capture their disciplinary area during the international experience. Fellows are currently being evaluated on their use of explicit critical thinking instructional strategies through scenario-based RLOs and the resulting impact of those strategies on the critical thinking abilities of their students.

### **Future plans and Advice to Others**

Once all data have been analyzed, results will be shared on the effectiveness of the GTA. We also plan to disseminate the scenario-based RLOs and develop a best practices guide for integrating international field experiences into critical thinking curriculum.

In regard to advice for others, the project had four GTA Fellows dropout and not participate in the international field experience due to unexpected health and family issues. As a result, we recommend future projects consider designating a small number of alternates to replace individuals who withdraw for health or family issues or are dismissed for failure to complete project requirements. We also recommend health warnings specific to the destination of international experience be included in recruitment materials.

### **Costs/Resources Needed**

The grant obtained from USDA-NIFA was \$642,779 for this project. Approximately, 32% of the direct expenses were for personnel, and 14% was domestic and foreign travel for faculty. Personnel and travel were the main expense of this project.

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**A Variable Frequency Drive Trainer for STEM Integration in Agricultural Mechanics**

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## **Introduction and Need for Innovation**

Agricultural mechanics is an important component of school-based agricultural education programs (McCubbins, Wells, Anderson, & Paulsen, 2017). Professional standards (American Association for Agricultural Education, 2017) require teachers to “be aware of cutting edge technology” (p. 2) and to “teach students how to use technology appropriate to the agricultural industry” (p. 2). Additionally, Stripling and Ricketts (2016) identified integrating STEM in agricultural education programs as a priority for the profession. Writing almost 20 years ago, Shinn (1998) identified the paradox of rapidly increasing applications of technology in agriculture coupled with a “decreasing emphasis on technology in . . . secondary agricultural education programs” (p. 2). Experts perceived that agricultural mechanics was low tech, used outdated equipment, did not address higher-level technology skills, and ignored emerging areas such as electronics and electrical controls (Shinn, 1998). We developed the instructional model described in this poster as an aid to integrating STEM-based, advanced electrical control applications into high school and university agricultural mechanics programs.

## **How it Works**

The speed (RPM) of an alternating current (AC) induction motor is determined by the number of poles in the stator windings and the frequency (cycles per second) of the applied AC voltage. As its name implies, a variable frequency drive (VFD) controls motor speed by altering the frequency of the voltage supplied to the motor. A VFD consists of three functional groups: an AC to direct current (DC) converter, a DC filter, and an output inverter. The AC to DC converter consists of diodes arranged as a bridge rectifier; these diodes allow current to flow in only one direction, producing a pulsating, half-wave DC output. The DC filter consists of a series-connected inductor and one or more parallel-connected capacitors. The inductor filters the current wave and the capacitors filter the voltage wave resulting in a pure DC signal to the output inverter. The output inverter consists of two insulated-gate bipolar transistors (IGBTs) per output phase. These IGBTs act as solid-state switches controlled by the VFD’s programmable microprocessor. The microprocessor is capable of switching the IGBTs thousands of times per second and at specific intervals, resulting in a three-phase AC variable voltage and a pulse-width modulated (PWM) frequency output. The duration of the “on” pulse determines the output voltage while the interval between “on” pulses determines the output frequency and thus the motor speed.

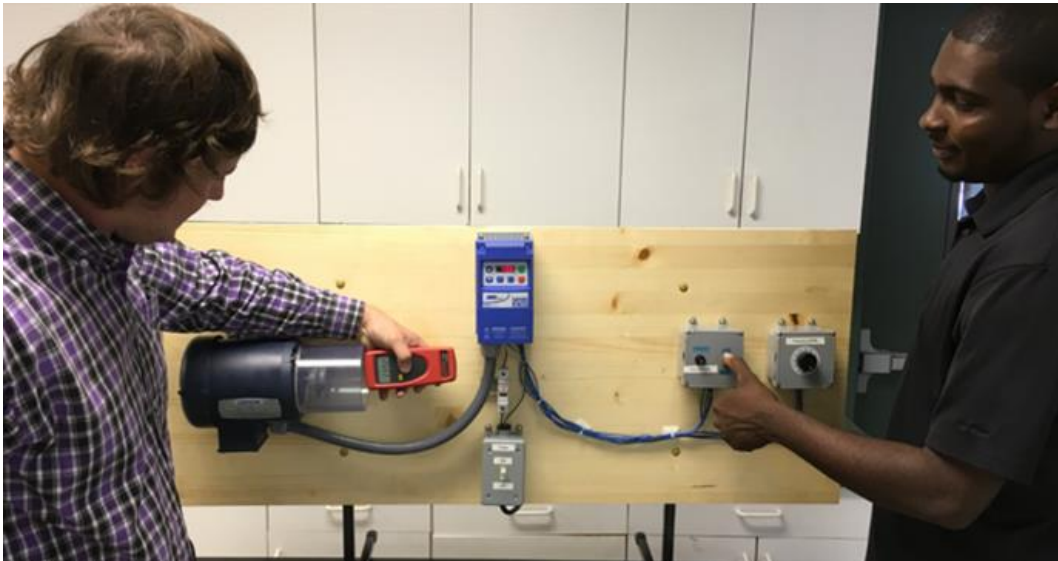
We developed a fully functional VFD trainer (Figure 1) for use in high school and university agricultural mechanics courses and for student recruitment activities. Students learn to program the trainer to set minimum and maximum motor speeds, acceleration and deceleration rates, and to select keypad or terminal board control (via the attached switches and potentiometer). In addition to controlling speed, students can program the VFD to allow reversing motor rotation and dozens of other options.

## **Costs and Resources**

Development of the trainer began with the selection of the VFD and motor combination. After evaluating various manufacturers, we selected the Lenze (Uxbridge, MA) SMVector ESV371-1S model VFD. This VFD accepts 120/240 VAC single-phase input and outputs 240 VAC three-phase at a rated output of 2.4 A at a variable frequency of 0 - 500 Hz. The VFD has a NEMA

Type-1 enclosure and is rated for control of three-phase motors of 0.5 HP (0.37 kW) or less. The cost for the VFD was \$251 per unit. We selected a Leeson (Grafton, WI) model C4T34FB5B 208-230 VAC three-phase motor for use on the trainer. The motor's rated power (0.33 HP or 0.25 kW) and current draw (1.4A @ 230 V) were within the capacity of the Lenze VFD. The totally enclosed, fan-cooled (TEFC) motor has a rated speed of 3450 RPM at 60 Hz and costs \$184 per unit.

We also purchased a 120 VAC, 3-prong power cord; a SPST switch; a 15-ampere cube fuse with a DIN-rail mounted finger-safe fuse holder; one 15 VDC-rated rotary on-off switch; one 15 VDC-rated SPST toggle switch; one linear-taper 5K ohm potentiometer; and PVC enclosures. These components were surface-mounted on a piece of 24-in x 48-in x 3/4-in display board and wired with individual AWG-16 THHW conductors (DC control devices) and AWG-12 THHW conductors in flexible non-metallic conduit (motor). The total cost for the trainer was \$534.70. Similar, commercially available trainers retail for \$2,595 per unit (Learning Lab, 2015).



*Figure 1.* The completed VFD trainer in use. Students are reversing motor rotation and measuring deceleration with a digital tachometer

### **Results to Date/Implications**

To date, we have primarily used the VFD trainer with visiting school groups to demonstrate advanced motor control concepts and STEM principles in agricultural mechanics. Student and teacher interest has been high, with several teachers taking photos and asking for materials lists.

### **Future Plans/Advice to Others**

We will incorporate the VFD trainer into our university electricity class, teacher inservice workshops, and school visits. We are developing short videos demonstrating how to program and operate the VFD trainer. Use of modern, industry-relevant trainers is an excellent method of integrating relevant STEM concepts into the curriculum while also modernizing the content and image of the agricultural mechanics instructional programs.

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**An intra-curricular approach in assisting underserved populations: Engaging the community in student development**

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## **An Intra-Curricular Approach in Assisting Underserved Populations: Engaging the Community in Student Development**

### **Need for Innovation Idea**

The Appalachia region of Kentucky is recognized as the highest distressed area within the Appalachian Regional Commission (Thorne, Tickamyer & Thorne, 2004). Haaga (2004) reported Kentucky as the lowest state, of the 13-state region, in college completion (13.7%) and highest for high school dropout (37.5%). As a result, the researchers sought to develop a curriculum that could assist in this community deficiency, through agricultural education.

Durden and Ellis (2003) note student motivation improves significantly when content is delivered in a uniquely empowering way, leading to improved attendance and high academic performance. One approach to doing so is by developing positive youth and adult relationships. Hastings, Barrett, Barbuto Jr., and Bell (2010) found youth and community engagement leads to youth ownership, empowerment, and confidence. In addition, youth gained community awareness along with a change in attitudes and perceptions. Multiple studies examining the same phenomena in a variety of contexts noticed similar results (Camino & Zeldin, 2002; Jarrett, Sullivan & Watkins, 2005; Bird, Martin, Tummons & Ball, 2010). An innovative agri-marketing curriculum has since been created to utilize the idea of youth and adult relationships to foster motivation, interest, and awareness of entrepreneurship opportunities for youth in resource-depleted communities of Kentucky.

### **How It Works**

The University of Kentucky implemented a school-community partnership approach to assist the poorest counties in the Appalachian region - all of which are in the poorest counties in the nation (Census Bureau, 2010). This approach entails secondary agricultural students enrolled in an agri-business course to partner with an agricultural business in their community.

From fall of 2016 to the summer of 2017, the project leadership team developed an agri-marketing curriculum with the assistance of a curriculum panel. In addition, a representative from the Kentucky Department of Education, Division of Career and Technical Education was included to ensure the curriculum aligned with current educational standards. The project team met with the Kentucky Association of Agricultural Educators (KAAE) and the Kentucky Small Business Development Center (KSBDC) to determine five secondary agriculture programs and five community agri-businesses for curriculum implementation. These participants were selected due to unemployment and poverty rates within their community. A two-day professional training in the summer of 2017 provided teachers and business leaders with the materials and methodological practices needed for the curriculum. The teachers began curriculum implementation during the 2017-2018 academic year.

The agri-marketing curriculum was created to strengthen secondary youths' relationships with adults in their community using experiential learning. To do so, students will work with their selected agricultural business to develop a thorough marketing plan by the completion of the curriculum. The students will work in groups of three to develop one marketing plan for the business. Consequently, the curriculum will explore topics essential to creating an agri-marketing plan, all within nine fundamental units. Each unit builds upon the previous with frequent overlap and reference to other subjects due to the meshing nature of a marketing plan. As students complete a unit and its corresponding summative assessment, they will have prepared a portion of the marketing plan. The end of course exam is the students' efficacy in

compiling the previously completed portions of the marketing plan into one comprehensive marketing plan which will be presented to the partnered agri-business. The curriculum is anticipated to consume 85 instructional days to fully implement.

To obtain the required information needed to develop the agri-marketing plans, students will combine their learning from classroom instruction as well as learning attained from their interactions with the community agri-business partner and KSBDC representative. Students will visit their school's partnered agri-business at least twice during the duration of the curriculum. Schools and business owners are encouraged to work together on numerous, additional occasions for students to increase their interaction with their community partners. The University of Kentucky project research team are providing on-going visits for support throughout the curriculum implementation. A teacher log survey was sent to each teacher every two weeks to document feedback as they progress with the curriculum project.

### **Results to Date**

The two-day workshop on the execution of the agri-marketing curriculum marked the completion of the curriculum writing and the beginning of implementation. There were four themes present in the teacher feedback following the workshop: the project provides for relevance to the students, a connection to the community, a variety of activities, and a future possibility of extending and continuing the project after the pilot year is over.

Instruction of the agri-marketing curriculum has begun. Four of the five selected agricultural educators are currently teaching the curriculum in their classrooms. The last educator is on a block academic schedule; therefore, this teacher will begin the curriculum in January 2018. There will be about 96 students between the five classrooms who will receive instruction. Students and the community business partners have met at least once thus far.

### **Future Plans**

It is the desire of the project leadership team to further evaluate the agri-marketing curriculum by expanding the study throughout the United States with a 5-year federal School to Work grant allocation. Upon completion of the research studies of the curriculum, an interactive and electronic textbook will be drafted that assists secondary classroom teachers with the necessary content knowledge and activities to be utilized within all agricultural classrooms. With collaborations among the KSBDC, the National FFA Organization, and the National Association of Agricultural Educators (NAAE), it is the overall desire that professional development workshops can assist teachers across the nation in developing interactive methods to teach entrepreneurship which aids the communities in which their programs arise.

### **Cost/Resources Needed**

The budget is approximately divided as follows: personnel \$58,960 (44%), workshop supplies \$1,340 (1%), university travel \$4,020 (3%), and participant support \$30,820 (23%). Salary is included for university faculty and staff to ensure the overarching goal and objectives are achieved. Travel funding is provided to assist the leadership team with helping the teachers implement the curriculum. Stipends for teachers and business owners are provided to encourage participation and teachers are provided an allowance for teaching materials, supplies and field trip expenses to the business. Each business will receive funding to implement the designed plans as well as funding to hire one of the students, as an intern, to facilitate the actions items of the accepted agri-marketing plan.

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**Award Points Program: Utilization of Google Sheets™ Pivot Tables for Student Awards  
Points and Required FFA Activity Credits**

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## **Award Points Program: Utilization of Google Sheets™ Pivot Tables for Student Awards Points and Required FFA Activity Credits**

### **Introduction**

According to the National FFA Organization (2017), “FFA members who take advantage of the many leadership opportunities in FFA become top leaders in the organization” (p. 48). The FFA is a vital component of the comprehensive model for school-based agricultural education (SBAE) programs, which exists to provide experiences in personal, academic and career areas to build future leaders (National FFA Organization, 2017).

Within the educational framework of the SBAE program at Anderson Union High School, students enrolled in SBAE were required to attend four FFA Activities each semester as the FFA part of their grade in class. The American Association for Agricultural Education (AAAE) outlines standards for SBAE teacher preparation programs as learning goals for graduates of teacher education programs. The standards indicate all teacher education graduates learn to manage a total program in CTE, and develop skills to communicate effectively with parents and students (AAAE Teacher Education Standards Committee, 2017). For the educators at Anderson Union High School, tracking various events students attended and having attendance information readily available to teachers, students, and parents was imperative.

Prior to the implementation of the Points Award Program, points were tracked using an Excel spreadsheet saved to a shared computer drive. Each student’s name was listed in a separate row, and each event he or she participated was listed in a separate column. With 150 students and more than 75 events each year, the original spreadsheet became overwhelming and cumbersome. As such, individuals who entered participation points made errors, which affected students’ overall points and FFA grade. The points system also required two separate categories within the totaled points system and needed to be able to: (a) count the number of activities a student attended, (b) identify which quarter the events were attended, (c) calculate the total activity points for the end of the year awards trip, and (d) provide a list of the top 25 students for the awards trip. Therefore, a ledger-based program was developed.

The initial ledger-based system allowed points to be entered systematically based on the student’s name and entries could be double-checked by the advisor more efficiently. However, the point tallying was done by hand with a group-sort and group-count method, and problems with the program persisted. The problems addressed after the introduction of the initial system included (a) only one person being able to edit at any given time, (b) the process to calculate points included confusing steps, (c) students’ names were being entered incorrectly which split their points between the different versions of the name, and (d) to share results with students, reports had to be printed. This established the need for a more streamlined system.

The Award Points Program was designed using Google Sheets™ and improved the original ledger system by addressing the issue of multiple authors. By utilizing Google Sheets™, points can be entered by any person allowed editing access. Also, because it is web based, points can be added using any electronic device at any FFA activity, thus updating points as they are achieved. To improve the calculation of points, pivot tables were introduced. The pivot tables work automatically to tally the points rather than having to manually group-sort and then group-count. To address area (c), students’ names were uploaded into a master list and a data validation code was added to the master ledger. The master ledger then used a drop-down menu with the students’ names feeding from the master list, so a student’s name must be on the master list to be added for points. Finally, with Google Sheets™ being web based, the pivot tables were embedded in the chapter website, giving parents and students 24-7 access to points.

## How it works

FFA Advisors gain access to the Award Points Program via Google Sheets™, and save it to Google Drive™. Next, students' names were added to the MASTER LIST. Individuals granted editing privileges added student activities to the ledger. In the case of the developer, the FFA Advisors and chapter sentinel added activities, and students were awarded both FFA points (for awards trip at the end of the year) and activity points (points toward the FFA component of student's class grade). The LEDGER was updated following every chapter activity, and live results built in PIVOT TABLES were embedded in the chapter website as shown in Figure 1.

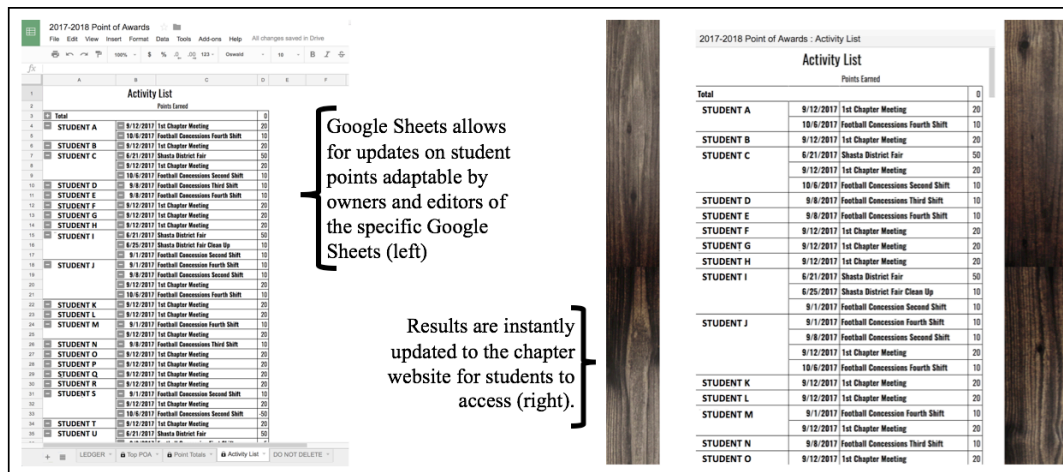


Figure 1. The Award Points Program developed in Google Sheets™ pivot tables as used by Anderson Union High School.

## Results to date

The Google Sheet was made available to all teachers within the Agricultural Education program at Anderson Union High School, and the resulting pivot tables were also embedded into the FFA chapter website which allowed students to see their up-to-date FFA Points and Activities. Students were able to print activity lists to complete their FFA record book. Also, teachers were able to sort activity points for students by quarter and assign student grades for their respective agricultural classes. Each year, the ledger sheet and pivot tables were placed into an archive for use on State and American FFA Degree applications.

## Future plans

The Award Points Program has been shared with other FFA Chapters in California and continues to be the basis of point calculations at the Anderson FFA Chapter where it was developed. With the sharing capability of Google Sheets™, the Award Points Program can be easily shared and modified to any SBAE program. Also, since it is web based, the developer is able to provide troubleshooting with chapters using the program. Future plans include using this program in teacher preparation as a tool to help future agricultural education teachers keep track of FFA activities and awards points.

## Costs/Resources Needed

Program of Activities Spreadsheet - FREE

Google Sheets™ – FREE

Chapter Website – cost varies, can be housed on school website

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## **Creating Student Empowerment and Inclusion for Underserved Youth in Agriculture**

### **Introduction/Need for Innovation of Idea**

In the state of Kentucky, there are over 42,000 teachers in public schools of which only five percent are non-white. (United States Census Bureau, 2016) Within agricultural education, even larger discrepancies in demographics can be seen amongst the students and teachers. In fact, there is only one teacher of color. Beyond race, there are various groups of underserved populations based on socioeconomic standings, geographical location and gender. In the secondary agricultural education programs, many of these underserved groups are not provided the opportunity of their classroom colleagues.

People use colorblindness to combat the negative outcomes that stem from social categorization, as well as prejudice and stereotyping (Richeson & Bussbaum, 2003). The intentions of colorblindness can be positive, but the impacts can be detrimental to a group. Colorblindness can hinder learning, limit members' sense of self and group efficacy, and prevent success of an organization. Groups that do not encourage members to use their cultural experiences create tension, competitiveness and distrust. (Ely & Thompson, 2001)

Groups that are more willing to embrace and encourage cultural experiences instead of observing them through a colorblindness lens, would be able to create a new mindset which would thrive with contentedness, no competitiveness and trust. By embracing, acknowledging and appreciating distinctions within a group, a multicultural mindset can be established. To have a completely inclusive group where diversity flourishes, a mindset transition from a colorblind state to a multicultural state is needed. Pinpointing the best intergroup decisions supports the multicultural mindset that is needed for diverse groups to succeed (Apfelbaum, Grunberg, Halevy and Kang, 2016). Encouraging multiculturalism in an educational program is an effective practice for increasing diversity in a working environment (Lockwood, 2005).

To have a completely inclusive secondary agriculture program where diversity flourishes, a mindset switch from a colorblind state to a multicultural state. Educational programs that encourage multiculturalism are an effective practice for increasing diversity in a working environment (Lockwood, 2005). Creating an initiative that encourages multicultural mindsets and empowers underserved populations can help agricultural education programs to embrace the diversity within.

### **How it works/Methodology**

The purpose of this project is to establish an opportunity for FFA program to promote inclusion and empowerment of underserved populations. In cooperation with the National Minorities in Agriculture and Natural Resources and Related Sciences (MANRRS) Organization, voluntary FFA chapters would develop an activity for each of the three major constructs below:

1. Construct I: Create and establish a safe space for members of the chapter
2. Construct II: Develop leadership skills and empower youth from underserved populations
3. Construct III: Encourage inclusion and exploration of other cultures

Once schools provide evidence of an event implementation, the FFA chapter would receive the identity as a certified JR. MANRRS Affiliate and would be eligible for all opportunities associate with the MANRRS organization. A weekend officer retreat, hosted by the University of Kentucky's Agricultural Education and MANRRS, would occur that engaged students in a variety of trainings of methods for meeting each of the constructs. During the retreat, chapter officers would modify current program of activities to include approaches for reaching each of the three constructs. In addition, the retreat would provide training on inclusiveness, selflessness, and service-led methods.

### **Results to date/implications**

Twelve schools, representing a chapter from each of the 12-region state, were identified and planning for the February implementation are occurring. Funding was acquired from the Kentucky FFA Foundation, a College of Ag supported grant, and private donations. A training program was developed with the idea that many of these students are not as comfortable with their multicultural awareness than others; thus, entry level concepts were implemented. To assist with the comfortability of the students, a safe and familiar location was selected - the Kentucky FFA Camp.

Numerous planning meetings with the National MANRRS Organization and the Kentucky FFA Association has occurred to assist in preparing a program that would encourage, and not threaten, the youth and teachers of the opportunities for engaging all members with opportunities and methods for recruiting a diverse membership. Finally, an instrument was designed and tested to evaluate the growth mindset of the students prior to the training program and at the end of the school year in May.

### **Future Plans/Advice to others**

Although this project is based in Kentucky, the growing need for diverse educated students in the field of agriculture is in growing demand. At the end of the academic year of program implementation, a presentation is planned among the National MANRRS Organization and the National FFA Organization regarding the results from the program and the variety of methods of how the 12-chapters implemented the program.

### **Cost Resources Needed**

Students will be provided with an opportunity to attend a two-day training where they will be provided lodging and meals. Funds needed for this project will go to providing the meals and lodging at the Kentucky FFA Camp. The estimated cost to attend the training would be \$45.00 per person, which equals \$315.00 for each chapter. Funds will also be needed for traveling to observe and certify that programs are meeting standards. The estimated cost needed to send a University of Kentucky representative to the twelve project locations throughout the year is \$1,500.

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## **Critical Conversations: Using a Video Podcast to Engage Teachers in Philosophical Discussions about Agricultural Education**

### **Need for Innovation**

Despite a multi-decade focus on teacher recruitment and retention, the agricultural education profession continues to grapple with a nationwide teacher shortage (Smith, Lawver, & Foster, 2017). Previous research has focused on a myriad of factors thought to contribute to teacher retention, one of them being teacher satisfaction (Blackburn, Bunch, & Haynes, 2017; Byrd, Anderson, & Paulsen, 2015; Hasselquist, Herndon, & Kitchel, 2017; Sorenson, McKim, & Velez, 2016). Teacher satisfaction can be enhanced by a number of components, including a sense of belonging within the school culture (Hasselquist et al., 2017), strong self-efficacy (Blackburn et al., 2017), achievement of healthy work-life balance (Sorenson et al., 2016), and resource availability (Byrd et al, 2015). However, moving the needle for teachers in any of these areas can be challenging; for example, resource availability, work-life balance, and building relationships with other teachers are dependent on external factors, while building self-efficacy can require considerable time and professional development. Within the nursing profession, Zurmehly (2008) found that autonomy and the opportunity to think critically were positively correlated to job satisfaction. In an effort to encourage high school agriculture teachers to think critically about their profession and empower them to build the autonomy required to engage in professional change, we created a series of video-recorded “Critical Conversations”, which are delivered to agriculture teachers via social media avenues.

### **How It Works**

The Critical Conversations project introduces teachers to contentious issues within agricultural education through video-recorded informal debates between three researchers. The research team created a list of contentious issues, gathered background information on each topic, and met in person to record the conversations. Example topics included the reality of career pathways, the potential impacts of a world without agricultural education, whether agriculture teachers are professionals, and whether agricultural education should be following the three-circle model. One researcher served as moderator, introducing the topic of conversation and guiding the conversation as necessary. Following recording, one researcher edited the videos and posted them to a YouTube channel. Another researcher edited the recordings to create audio podcasts, which were posted to a Podbean channel. Both of these channels were linked to an existing electronic information network for agriculture teachers called [blinded for review], which includes a WordPress site, a Facebook page, an Instagram page, and a Twitter page. The final researcher posted the edited recordings to the various [blinded for review] sites for teachers to consume.

### **Results to Date**

Seven critical conversations were recorded and edited for dissemination to agriculture teachers via [blinded for review]. To date, three of the critical conversations have been disseminated as an integrated component of the [blinded for review] posting schedule. The three critical conversation videos have been viewed a total of 1,956 times, while the podcasts have been listened to a total of 159 times. Comments on the social media posts have indicated teachers’ interest in engaging in the conversation, and have included likes, shares, text comments, and GIF comments. Additionally, one state’s Supervisor of Agricultural Education contacted the researchers and stated, “an agriculture teacher sent me the link and asked for my thoughts. I

watched it and then called her and had a 30-minute conversation with her about it. The video made me think a lot about my own views on the topic, and I hadn't done that before."

#### **Future Plans/Advice to Others**

We plan to continue recording and disseminating critical conversations to high school agriculture teachers through [blinded for review]. We will continue to monitor audience engagement with the two formats, as well as methods of engagement via the different social media sites, to maximize efficiency within the recording and dissemination processes. Should engagement continue to increase, we plan on exploring avenues for sponsorship of the critical conversations in order to fund advertising of the critical conversations and the social media network. Finally, we plan to assess the impact of the critical conversations on teachers' perceptions of autonomy, critical thinking, and job satisfaction.

We advise that agriculture teacher educators encourage their state's teachers to join the [blinded for review] network and engage in the critical conversations. The recordings can guide conversations within statewide professional development for agriculture teachers, strengthening the network of critical thinkers passionate about the future of agricultural education.

We also advise organizations looking for a way to engage members in philosophical discussion utilize these critical conversations as a model of production and dissemination. With minimal startup cost and no recurring cost, this model enables researchers to attempt to improve audience members' autonomy and critical thinking in a manner that is easily consumed.

#### **Costs/Resources Needed**

While the dissemination of the critical conversations was free via the various electronic platforms, equipment was needed to produce the recordings. An i-Pad was used to record videos, while a Swivl was used to record audio. We also utilized a Yeti microphone to improve audio quality on the video. The researchers incurred travel costs to meet in order to record the conversations; however, these could be minimized if paired with an existing conference or event to which all researchers were already travelling. The team uses the software program Audacity to edit all audio for the podcasts. Audacity is a free, open source cross-platform audio software. It takes approximately 45 minutes to review and edit each Critical Conversation podcast. Finally, while approximately 15 minutes every other week must be allocated to post the critical conversations, a free or paid Hootsuite account can streamline the posting process.



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**Developing a Learning Community of First Generation College Student Veterans**

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## Introduction and Need for Innovative Idea

Incoming students who are also first generation college students and veterans represent a sub-population that pose unique challenges to universities. Ackerman, DiRamio, & Mitchell (2009, p.12) describe veterans in academic settings as a “population with special needs.” Veterans are faced with transitional challenges while assimilating into a college campus. Adjusting from the military to academic life makes veterans shift from the “strictly defined structure” with a chain of command, to a “loosely configured campus” (Ackerman et al., 2009, p. 12). While many veterans value the change to a college culture away from the restrictions of the military (i.e., military attire and combat decisions), others struggle with the aspects they were accustomed to (i.e., respect from their peers and positional ranks) (Ryan, Carlstrom, Hughey, & Harris, 2011).

Returning veterans have stated frustrations of being in classes with younger students and find relationships with fellow veterans to be helpful (O’Herrin, 2011). Also, student veterans have similar disadvantages to first generation students including a “lack of ability to navigate the systems and bureaucracy of a college campus” (Vacchi, 2012, p.19).

According to Ackerman et al. (2009, p. 12), veterans “represent a potential campus resource” with their leadership experiences and background in working with difficult challenges. While veterans, like most university level students, are categorized as adult learners (Knowles, Holton, & Swanson, 1994), “there is a widespread lack of knowledge about the unique needs of veterans in higher education...College administrators and professors must update programs and services to better accommodate and support the large number of veterans returning to campus” (Hermann, Raybeck, & Wilson, 2008, p. A99). Learning communities in higher education have been proven to increase, “academic achievements, better retention rates, greater satisfaction with college life, and improve quality of thinking and communicating” (Lenning & Ebbers, 1999, p. 6).

Due to Texas A&M University’s (TAMU) identification as a military-friendly university that attracts many veteran students (Veteran Services Office, 2017), it is imperative that they create programs to reflect student veterans’ unique needs. According to the Veteran Services Office at TAMU, TAMU has a total of 676 undergraduate student veterans, of which 274 are first-generation college students (2017). The purpose of this innovative idea is share how TAMU created a learning community with an environment that fosters relationships between student veterans and faculty and staff within the College of Agriculture and Life Sciences (AGLS) and equips first generation student veterans with the tools and resources necessary to be a successful student at TAMU. While student veterans do not exclusively exist within colleges of agriculture, this innovative idea is a tool on how to connect sub-populations to faculty and staff within colleges of agriculture through learning communities and individualized mentoring programs. Therefore, this model which caters to a nontraditional population serves as a response to National AAAR Research Agenda Priority 4 to develop meaningful learning environments which meets the needs of a nontraditional audience (Roberts, Harder, & Brashears, 2016).

### **Methodology**

Recruitment of first generation veteran students happened in partnership with TAMU's Office of Veterans Services and academic advisors in TAMU's College of AGLS. The student veterans participate in a learning community structured with bi-weekly meetings. At the meetings, speakers focus on topics identified as areas of interest or need by the student veterans.

Each veteran is paired with a mentor from the College of AGLS. The mentoring program includes a minimum of monthly interactions that are tailored to the individual student veteran's needs while developing a relationship with an employee of TAMU. Each student veteran finds a service project related to the six grand challenges TAMU has identified from which one service project will be completed at the end of their first year. As this is instructed as a 0-credit or 1-credit course, students are evaluated through participation, speaker evaluations and reflections on a pass/fail scale.

### **Results to Date**

The first cohort of the First Generation Veterans' learning community is eleven students from six colleges at TAMU enrolled in the year-long program. Four faculty members and one staff member from the College of AGLS are coordinating this project. Eleven faculty and staff members from the College of AGLS have volunteered as mentors for the first year of the program. Topics for fall 2017's meetings, identified by the student veterans, include study skills, TAMU's Veterans Resource Center, TAMU's grand challenges, money management and StrengthsQuest evaluation.

### **Future Plans**

With successful completion of the first year, a second cohort of the learning community will be recruited. The learning community is currently structured to allow up to 30 veterans per cohort. The coordinating group of faculty members are currently pursuing corporate sponsors to alleviate the cost of the program on the university. Also, a long-term goal of this program includes having a cohort exclusively of student veterans from the College of AGLS.

### **Resources Needed**

Funding for the following items have been identified for the learning community: breakfast for learning community meetings, service project resources, learning assessments including the StrengthsQuest evaluation, recognition of veterans at the College of AGLS awards ceremony, branded clothing and scholarships. A grant was obtained through the Provost office at TAMU to cover expenses for the first year. Students also received a \$500 scholarship per semester to help with academic-related costs. The total cost of the program is approximately \$15,000 a year.

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**Early Field Observations: An in-depth approach of career exploration**

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## **Early Field Observations: An in-depth approach of career exploration**

### **Introduction**

“Agricultural teacher education programs should expose students to and make them aware of the vast array of opportunities and responsibilities related to teaching agricultural education” (Baker, Culbertson, Robinson, & Ramsey, 2017, p. 264). Student requirements vary from program to program; however, most agricultural education teacher preparation programs require early field experiences (EFE) for students throughout the program (Retallick & Miller 2007). According to the Oklahoma State University Professional Education Student Handbook, prior to clinical practice, pre-service teachers at Oklahoma State are required to complete 60 hours of diverse field experiences.

Aiken and Day (1999) recommend the need for alternate EFE practices and identify the use of EFEs to prepare teachers, making them beneficial in exposing students to the profession of teaching. Aiken and Day (1999) also suggest early field experiences be monitored for knowledge acquisition, and specific techniques be observed to ensure the pre-service teacher’s learning objectives parallel those of the teacher preparation institution. Various forms of EFE are integrated into multiple pre-service agricultural education classes at Oklahoma State University and includes four hours of early field observation (EFO) to be completed in the Foundations and Philosophy of Agricultural Education course.

The Early Field Observation Packet is designed to provide structure and guidance to the observation experience, integrating key topics taught in the class, including the characteristics of effective teachers, learning environments, and interactions with learners. Baker et al., (2017) implemented a photovoice early field observation experience, allowing students to capture what they observed in a single picture and reflect upon the observation later with the help of the instructor. The Early Field Observation Packet implemented in this innovation as a succession to the photovoice experience.

### **How it works/methodology/program phases/steps**

Pre-service teachers in the Foundations and Philosophy of Agricultural Education course were guided through their EFO experience with a five-part observation packet. Students were assigned the Early Field Observation assignment during the 3rd week of the class. Using the scripted worksheets, students were instructed to observe, collect artifacts, and reflect upon key elements in the school-based agricultural education (SBAE) program where they conduct an on-site visit.

Part 1 of the packet required students to observe various learning environments for the SBAE program, including classrooms, the agricultural mechanics laboratory, and other learning laboratories (e.g. greenhouse, school farm, etc.). Students were instructed to focus on the following aspects of the learning environment: Is it clean and orderly? Is it arranged in a way to enhance learning? Is there ample space for the number of students in the class? Is the technology up to date? Is equipment in good working condition? Does the environment appear to be safe to use? Students are also asked to consider what they would do differently if the facility were theirs to manage. Students were also required to include photos of the learning environments.

In Part 2, students observed a teacher and rated the teacher based on the top five traits of effective teachers described by Rosenshine and Furst (1971).

In Part 3, students observed the teacher’s classroom management. Students responded to a series of questions based on the teacher’s use of classroom management strategies, including setting expectations, behavior management, positive reinforcement and addressing negative

behaviors. Finally, students were asked if they would make changes to the approach of classroom and behavior management they observed.

In Part 4, the pre-service teachers were charged to look at the topic of instructional planning. To guide their observation, they addressed whether the teacher used routines, provided an interest approach, if visual aides were used, and if they were effective. Students also asked to identify if and how learning was assessed.

In Part 5, pre-service teachers observed student engagement. They assessed the level of interest generated and maintained by the teacher throughout the class period and identified approaches and techniques used to increase or decrease student interest. Part 5 also addressed frequency of questions asked during the lesson. Pre-service teachers tallied the number of questions asked and identified students who answered those questions. They also tracked the cognitive level of questions asked using the Bloom's Taxonomy scale.

After the due date, the instructional team for the class evaluated students' packets using a rubric designed for the assignment. Digital copies were kept on file for later use. One of the last lecture sessions for the course was dedicated to discussing the observation experience. Students were able to compare and contrast their observations and reflections to those of their peers.

### **Results to date/implications**

To date, this EFO packet has been used twice in the Foundations class. Review of completed packets indicates this guided approach is serving its purpose. Course instructors concluded students were able to make strong connections between concepts taught in the class with their field observations. Making these connections during the EFO experience strengthens the bridge between concepts and applications, further setting the stage for courses and experiences to follow in their preparation to become school-based agricultural education teachers.

### **Future plans/advice to others**

Future plans are to continue using this tool within the Foundations class and to analyze information contained in the reports. The packets are rich in quantitative and qualitative data that can provide insight to what pre-service students observe, and how they process those observations. Data from the observation forms provide information about SBAE programs and teachers that might help identify sites and mentors for other pre-service teacher experiences.

We advise others to implement a similar model into teacher preparation programs to track and measure EFOs of future agricultural educators. Future research should be conducted investigating the impact of the EFO on the teacher aspirants, considering the facilities observed, the effectiveness of the teacher, and the overall impact on student learning.

### **Costs/resources needed**

There are no costs for the department associated with this project. Packets are distributed digitally via the course website and students submit their work by posting the completed document using the online submission tool. The only additional costs required of students is transportation to the school where they conduct the observation.



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**Educating First Responders to Assist in an Agricultural Hazardous Situation**

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## Introduction

Grain entrapments continue to be a significant and deadly danger on crop farming operations. According to the Purdue Agricultural Confined Space Incident Database (PACSID), grain entrapments have been steadily increasing over the past 10 years (Field, Issa, & Cheng, 2015). Farmers may enter grain storage bins in order to manage their product, and if the grain bin and equipment are not secure, one could find themselves quickly submerged in grain. In fact, it only takes four or five seconds to become helpless in flowing grain, and less than 20 seconds to become completely submerged (Field, W. E., n.d.). Time is critical when working with a grain entrapment. Firefighters are often the first to arrive on the scene of an entrapment, meaning it is necessary for first responders in rural areas to receive adequate training on rescuing a victim. Volunteer departments are often the most proximal to the farm, as well as often being underequipped and undertrained for the event.

In order to meet the needs of an ever-growing population, grain operations will be pushed to a level of efficiency that can create potentially hazardous environments. Farmers and first responders must understand the risks encountered on grain operations, as well as the specific rescue equipment needed for accidents on these farms. The innovative idea proposed here utilizes educational outreach trainings and materials to aid first responders in developing life-saving skills that are exclusive to accidents within the agricultural industry, while also exploring new techniques and products available to first responders and farmers. This idea aligns with Research Priority Two of the 2016-2020 American Association for Agricultural Education Research Agenda: New Technologies, Practices, and Products Adoption Decisions (Lindner, Rodriguez, Strong, Jones, & Layfield, 2016).

## How it Works/Methodology

Researchers and firefighters worked in unity to create a comprehensive analysis of Grain Rescue Tubes, a life-saving device that allows first responders to move grain away from an entrapped victim to prevent further engulfment and extract them from the bin. The Grain Bin Entrapment project provided the funds to purchase the 10 most commonly used grain rescue tubes that are popularly utilized by first responders; these tubes were analyzed for physical characteristics (i.e. weight and type of material), ease of operation (e.g. storage space needed), and time to rescue the individual (from rescue truck - to bin - to human rescue). In addition, supplemental materials were purchased that are used to aid firefighters in the rescue process, including drill-powered handheld augers, rope and pulley systems, and grain walking shoes. The process of purchasing this equipment was used as an educational tool to assist first responders in making the best decisions for their program when dealing with grain entrapments. Only materials that would be available to these departments for purchase were used in the exercise.

A training at the end of harvest season on a farm site in Central Kentucky was conducted for community-led partner, the Dixie Fire Fighters Association (a training cohort, representing fire fighters in a 12-county region). Community members, firefighters, representatives from companies selling entrapment equipment, experts in rescue, grain bin manufacturers, legislatures, and agricultural educators were in attendance to assist, educate, evaluate, and collect feedback on the equipment sampled. The comprehensive training session included real-world scenarios

that a firefighter might encounter. Utilizing all 10 rescue grain tubes, the fire fighters engaged in a grain entrapment rescue mission with live and mannequin humans to represent conscious and unconscious victims. Prior to each rescue scenario, each team of fire fighters were provided with 15-minutes to review the next rescue tube and determine a plan for implementation. Agricultural educators and experienced rescue personnel provided feedback and correction to first responders as they navigated the scenarios. Data collected from the event was compiled into a comprehensive manual that will serve as a guide to the equipment and rescue strategies. This manual is being distributed to fire departments and farmers across the country to allow others in crop producing areas to make informed decisions when investing in rescue equipment.

### **Results to Date/Implications**

This innovative idea was first established through a collaboration of the Dixie Regional Firefighters Association, the Kentucky Department of Agriculture – Agricultural Education Division, the Southeast Center for Agricultural Health and Injury Prevention (SCAHIP) and the University of Kentucky Agricultural Education program. Following the initial trainings, the Dixie Firefighters and the Kentucky Department of Agriculture obtained comfortability to provide similar trainings for rural fire departments across the state who might encounter a grain entrapment. The travelling training program for community-led fire departments have developed into local partnerships supporting farmers. The information collected is being developed into an informational guide so all communities in eight southern states will have to assist in their rescue equipment purchasing decisions.

### **Future Plans/Advice to Others**

It is the desire of the researchers that the informational guide and manual be available for teachers throughout the United States through web and agriculture media approaches. The monitor of the manual is necessary, to maintain validity as the industry continues to expand. As new rescue devices are developed, and revised, further assessment should be done to keep record of the comparative effectiveness of various equipment, as well as a guide for proper use. The innovative project hopes to educate first responders to increase trainings on entrapments; utilize agricultural education to assist in best practices for delivery; and allocate funds to providing equipment needed to rescue a victim.

### **Cost/Resources Needed**

One of the deterring factors in purchasing a grain rescue tube is cost. This innovative idea required the use of 10 grain entrapment safety devices to make the best judgment of what device best serves a community's need; thus, the agricultural education program at the University of Kentucky received a grant of \$28,000 to purchase materials from distributors (including shipping and processing fees); compensate employees of the project; and cover travel expenditures. The location for the training, consisting of filled grain bins, was voluntarily contributed by a farmer located in the central region of Kentucky for grain production.

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**Enabling Agriculture Teacher Candidate Preparation with Technology and Resources**

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## **Enabling Agriculture Teacher Candidate Preparation with Technology and Resources**

### **Introduction/ Need for Innovation**

Agriculture teachers have access to a variety of agricultural laboratories to support the development of conceptual skills, procedural skills, and personal skills (Phipps, Osborne, Dyer, & Ball, 2008). These laboratories include agricultural mechanics laboratories, livestock feeding facilities, greenhouses, land laboratories, horticulture facilities, and aquaculture laboratories (Franklin, 2008; Shoulders & Myers, 2012; Young & Edwards, 2005). In a national study, Shoulders and Myers (2012) reported over half of agriculture teachers use their laboratory facilities more than once per week. With frequent usage, how are preservice agriculture teachers prepared to utilize laboratory facilities and the related laboratory equipment in their instruction?

Ball and Knobloch (2005) examined the instructional strategies introduced and reinforced in teaching methods courses and found a variety of teaching methods, but nothing specific to laboratory instruction. A review of two teacher preparation courses at North Carolina State University concluded preservice students' micro-teachings had limited use of laboratory equipment, technology, and realia. In response, the department launched the "Agriculture Teaching Resource Room" for teacher candidates at all stages of their undergraduate and student teaching program.

### **How It Works**

After recent departmental renovations, a former office space of approximately 12 feet by 12 feet was transformed into the Agriculture Teaching Resource Room. To determine which items were necessary to make available to preservice teachers, the program leader reviewed the Agricultural Education Blueprint competencies used by teachers in the state. The room is stocked with technology and resources available in most North Carolina agriculture classrooms and is accessible to preservice teachers during normal business hours. Preservice teachers have the option of trying out equipment in the resource room or can check-out equipment for further practice or teaching experiences. A list of all materials found in the room is also posted on the door for quick reference. Inside the room, there is a check-out sheet where students record the date and item they are checking out and returning. For easy navigation of stored items, labels are posted on cabinet doors to help students locate equipment and supplies without having to rummage through the cabinet. Storage containers and boxes within the cabinets are labeled with contents for more search aids. Also, step-by-step instructions are posted near the stationary equipment such as the laminating machine, copier, and smart board providing self-guided instruction on how to use the technology.

### **Results to Date/Implications**

The Agriculture Teaching Resource Room was introduced to preservice teachers in Fall 2016. As a result, there was an increase in the use of realia and laboratory materials in micro-teaching lessons in both the sophomore introduction and senior methods course. The most

commonly used resources have been ear tags and applicators, vet wrap kits, and elastrators and bands. A professional development workshop was conducted by departmental faculty in November 2016 to acquaint students to some of the equipment, specifically probeware and microscopes.

### **Future Plans/Advice to Others**

In the future, a more thorough orientation to the resource room will be provided in agricultural education courses requiring a microteaching experience. Students were informed of the room during class, however, most students were not fully aware of all the equipment and supplies available to them. It is required that preservice students incorporate equipment, realia, or technology into at least one of their microteaching experiences. Due to the value of the equipment, it is important to maintain a detailed inventory and a well-considered check out and return policy. To provide the most realistic experience for student teachers in preparation for field experiences, the room should be setup in such a way that most closely replicates a classroom environment. The future of the Agriculture Teaching Resource Room is a more realistic model of a high school classroom with a more spacious design.

### **Costs/Resources Needed**

Fortunately, the cost of the room renovation was the responsibility of the university. To get the resource room up and running, funds were used from Educational Technology Fund allocated to the department. Time is an important cost to consider during start-up. The [University] room utilized the time of faculty for collection of initial inventory and a graduate student for setup and organization, totaling approximately 40 hours of planning and labor. Machines such as a laminator, copy machine, computer, and smart board are included in the room because they are valuable machines that teachers should be able to utilize in order to enhance their lesson prep and delivery. If students are expected to utilize technology to teach, they should practice with tools beyond a simple white board. For purposes of teaching evaluation and reflection, camcorders, GoPros, recording microphones and a miniature studio film set including a green screen and lighting are available for students. Recording equipment can be used to record micro-teachings or to create unique instructional materials. The inventory continues to grow as students donate extra materials they have from previous lessons or assignments. Accepting donated resources is an advised, cost effective practice for growing the stock of resources.

Agricultural education involves using content specific tools to supplement curricula and provide genuine hands-on learning experiences. It is imperative for agricultural education students to have access to agricultural tools and realia that can be used to facilitate student learning such as soil test kits, band castrators, and ear taggers. Inquiry teaching is more meaningful when teacher candidates practice facilitating labs with real microscopes, beakers, and test tubes, all tools found in the room. Early exposure to the integration of equipment, technology, and realia will encourage preservice students to seek instructional resources to be used throughout the student teaching experience and in their future teaching career.



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**Filling Buckets for Our Beginning Ag Teachers**

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## Filling Buckets for Our Beginning Ag Teachers

### Introduction/Need for Idea

Agricultural education has faced a continual shortage of qualified agriculture teachers over the past two decades (Smith, Lawver, & Foster, 2017). Therefore, state and national agricultural education leaders have engaged in efforts to recruit and retain people for careers in agricultural education (<https://www.naae.org/teachag/index.cfm>). The National Teach Ag Day and the Future Agriscience Teacher Symposium are examples of national efforts through the National Teach Ag Campaign to address teacher recruitment and retention. The Teach Ag website provides numerous ideas and suggestions for identifying and recruiting future agriculture teachers, as well as retaining current teachers. Teacher education faculty across have provided innovative statewide efforts to recruit potential teachers. Examples include an Agricultural Education Institute (Thoron, Osborne, Myers, Barrick, Roberts, & Dyer, 2016), letter of intent signing day (Thoron et al., 2016), Teach Ag! Avengers (Foster, Ewing, & Rice, 2015), and agricultural education instructor trading cards (Gerwig, Falk, & Touchstone, 2015). These activities reinforce the *family* atmosphere and community among agriculture teachers, which are linked to retention and job satisfaction (Darling & Hammond, 1997; Friedman & Kass, 2002).

### How It Works

To welcome new teachers to the profession and provide them with tools to start teaching, teacher educators at North Carolina State University developed the *Fill the Ag Ed Bucket* campaign. The first step was identifying new teachers. Prior to [State] annual summer conference, a list of beginning teachers since January 2017 and those recent graduates entering the agricultural education classroom was collected and placed into a Google Sheets document. This generated a list of 40 new teachers from all teacher preparation institutions and alternatively certified teachers.

We intended to fill the buckets with resources that could be used by a new teacher. Resources might include curriculum, books, bandages, tools, pencils, markers, sticky notes, coffee cards, etc. Teachers could even contribute used, but good condition resources from their own stocks. Due to limited resources and to foster a sense of community, we wanted veteran teachers, agriculture industry, and vendors across the state to help with the endeavor. To accomplish this, we sent requests to agricultural education stakeholders for donations to resources to fill the buckets and be given to beginning teachers. Stakeholders included local agricultural companies, commodity associations, vendors of agricultural education materials, and agricultural individuals, as well as current agriculture teachers.

Those receiving the link were able to sign-up to sponsor a specific individual's bucket or donate to all of the 40 buckets. A local Lowe's Home Improvement Store graciously donated the buckets to be used for the event. Other items were collected prior to or at the opening of the summer conference. Everything from dry erase markers, notebooks, seeds, tools, and welding rods were donated to fill the buckets. During the beginning teacher meeting, individuals were

instructed to pick up their bucket at the end of the day (due to all of them being heavy and overflowing with items).

### **Results to Date/Implications**

During this *Fill the Ag Ed Bucket* campaign, 36 beginning teachers received a bucket filled with much-needed classroom supplies. Over 50 individuals contributed to the buckets, some of whom were not directly connected to agriculture, but found merit with idea. One beginning teacher said “This was like Christmas. I emptied my bucket and was amazed at the items that people donated.” A teacher that was a “bucket-filler” stated, “I know how hard it was for me my first year with little money to buy those extra supplies for my classroom, so I wanted to give back. It was so much fun shopping for my beginning teacher.” Pictures of new teachers with their buckets were posted on various forms of social media, which positively promoted our family-like atmosphere and encouraged both the beginning and veteran teachers. Beginning teachers expressed how much it meant that so many agricultural education stakeholder groups cared about them. A list of every sponsor that participated in the event was placed in each bucket that allowed beginning teachers to know who invested in them. Beginning teachers provided thank-you notes or emails to their donors.

### **Future Plans/Advice to Others**

This year the buckets were distributed during the opening day at the annual summer teachers conference. In the future, we hope to distribute the bucket to the beginning teacher during a conference banquet. This would allow the beginning teacher to be recognized and presented with the bucket by their high school agriculture teacher, student teacher mentor, and their “bucket-filler.” This event was a tremendous success in bringing our veteran teachers and beginning teachers together. Due to the nature of mass emails, sending a personal email asking for a bucket filler is necessary. Many of the teachers expressed that they must have overlooked the mass email, but they are happy to contribute when contacted personally. Next year, due to the popularity and publicity of the event, we believe we will have even more bucket-fillers. Further, finding stakeholders may be a challenge for some. However, a post on a personal Facebook page led to individuals outside of agriculture to also contribute. Also, we intend for ownership of this event to move to the [State] agriculture teachers’ association, since it builds community.

### **Costs/Resources Needed**

The costs associated with this event varied between each bucket. Institutionally, the only cost was faculty time. Lowe’s Home Improvement donated the buckets, and our Farm Bureau Association and different agricultural commodity groups donated several other items. Most teachers stated they spent an average of \$25.00 on the supplies for each bucket. Organizing this event and securing some of the supplies involved an estimated 12 hours.

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**Flip the Script! Implementing Team-Based Learning in a Post-Secondary Agricultural  
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## Introduction

A variety of instructional approaches exist that could be implemented to provide students with the opportunity to develop and refine higher-order thinking skills (Allen, Donham, & Bernhardt, 2011; Hanson, 2006). Of all the instructional strategies available to teachers, Team-Based Learning (TBL) may provide the best framework for cognitive development, as well as building critical thinking skills (Michaelsen & Sweet, 2012).

Team-Based Learning (TBL) is a student-centered instructional approach that shifts instruction away from a traditional lecture based format (Nieder, Parmalee, Stolfi, & Hudes, 2005; Artz, Jacobs, & Boessen, 2016). In a TBL formatted course, students take on the responsibility of learning conceptual knowledge outside of class time, and spend more time applying that knowledge in class (Michaelsen, Knight, & Fink, 2004). Essentially, TBL is formatted to provide students with both conceptual and procedural knowledge (Michaelsen & Sweet, 2008). TBL follows the framework of a flipped classroom where students acquire the conceptual knowledge before class, allowing class time to be utilized for application of knowledge (Wallace, Walker, & Braseby, 2014).

In a TBL course the instructor's primary role shifts from dispensing content/information to facilitating the overall instructional process. The students move from being passive learners to taking on the responsibility of learning conceptual knowledge before class, so that they will be a valuable team member for in-class work (Michaelsen & Sweet, 2008). For TBL to be implemented properly there are four essential elements to consider: (a) Groups-formation/management of teams, (b) Accountability-students must be held responsible for the effort given on individual and team work, (c) Feedback- Students must receive frequent/timely feedback, and (d) Assignment design-Team work must promote both learning and team development (Michaelsen & Sweet, 2008). If TBL is implemented properly classroom experiences/environment can be much more enjoyable for both student and instructor (Sibley & Ostafichuk, 2013).

## How it Works

At the beginning of the course students will be broken into groups or teams that are permanent for the remainder of the course. These teams are designed to put all students on equal playing grounds and reduce preexisting relationships (Michaelsen & Sweet, 2008). Typically, a TBL course is broken down into 5-7 modules that usually require 2 weeks or longer to complete (Michaelsen, Davidson, & Major, 2014). The material taught from these modules build from simple concepts to more complex skills (Michaelsen, Knight, & Fink, 2004). At the beginning of each new structured module the students complete pre-class tasks (i.e., reading). Once the class has begun, students will be assessed individually over the material that they completed before class for content knowledge retention using an IRAT (Individual Readiness Assurance Test) and also in teams when they take their TRAT (Team Readiness Assurance Test). After the IRAT and TRATs the remaining in class period can be devoted to a short summary of the content covered to make sure all questions are being answered. The remaining portion of the class (application portion) is devoted to the students completing application exercises in teams. The application exercises are designed off the premise known as the 4's. These include: (a) significant problem, (b) same problem, (c) specific choice, and (d) simultaneous reporting. Each team completes the

same application exercises that present all 4's within a class period (Michaelsen et al., 2004; Sibley & Ostafichuk, 2013; Michaelsen, Davidson, & Major, 2014). This allows the students to apply the course content to real-world problems (Michaelsen, et al., 2004).

### **Results to Date/Implications**

A TBL formatted course was piloted in an agricultural mechanics independent study course during the fall 2017 semester with a group of three students. The students completed six modules covering small gas engines, each taking a week to complete. The modules consisted of safety, 4-cycle theory & fuel systems, tool and parts ID, ignition/electrical systems, cooling/lubrication & governor system, and finally troubleshooting. The students completed a reading over each module before class, and took their IRAT and TRATs in class. This particular part of the course was taught in sequential order by engine system. The modules were in sequential order by engine break down to try and help the students understand how each of the systems works together. Most of the time of this course was dedicated to the application exercise (disassembly/reassembly of the small engine). The final module, troubleshooting, was used as their final individual/team problem solving exercise. The students in this course averaged 82.1% on all IRAT's and averaged 97.5% on all TRAT's.

### **Future plans/Advice to others**

Future plans include implementing TBL in a regularly scheduled agricultural mechanics course at Louisiana State University. The current agricultural mechanics course at Louisiana State University will be redesigned into TBL consisting of three units: Small Gas Engines, Agricultural Structures, and Electricity. It is advised that teams be purposefully divided based on some criteria to allow for equality amongst members. For functionality and practicality, teams should be contained to six members. It is also advised that before teams take their TRAT's a review of material and content be covered to ensure mastery and proper application.

### **Costs/resources needed**

The main cost attributed to implementing TBL is the scoring system for the IRAT/TRATs. Traditionally, IF-AT (Immediate Feedback Assessment Technique) "scratch off" forms are used to give immediate feedback to students on their IRAT/TRATs. Using the IF-AT forms allows for real time feedback on their answers and allows them to receive partial credit. This real time feedback, also allows the students to appeal any questions which they have failed. However, the IF-AT cards do have some limitations. When ordering the IF-AT forms your must order consist of a minimum of 500 IF-AT forms, which costs \$115.00 for 25 questions/4 answer choices per card. A computer based alternative, GradeCam, however could be more cost effective. GradeCam works on the same premise as IF-AT forms, but the students don't have the opportunity to receive partial credit for wrong answers. GradeCam still provides immediate feedback on wrong answers, and the students can appeal wrong answers. GradeCam cost's is free for an unlimited number of students, as long as the IRAT and TRAT's are limited to 10 questions.



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**Grip and Grin: An innovative approach to incorporating advisory committee members into SAE instruction**

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## Introduction

Agricultural education employs a three-circle model in which students receive systematic instruction in the classroom/laboratory setting, engage in leadership training through the National FFA Organization, and gain contextualized experience in agriculture through the Supervised Agricultural Experience (SAE) program. Phipps, Osborne, Dyer, and Ball (2008) define an SAE program as consisting of “planned, sequential agricultural activities of educational value conducted by students outside of class and laboratory instruction for which systematic instruction and supervision are provided by their teachers, parents, employers or others” (p.438). Although it is an integral part of the agricultural education program, it has been reported that the number of students who begin and complete an SAE program has been decreasing (Rubenstein & Thoron, 2015) for a variety of reasons including resource availability, motivation, and communication between program partners. At Nonnewaug High School in Woodbury, Connecticut all students enrolled in agricultural education classes are required to maintain an SAE project in which they work a minimum of two hundred hours per school year. Although students from Nonnewaug’s program have been successful in completing high-quality SAE programs since the program’s inception in 1920, the agricultural education staff noticed that students were experiencing increasing difficulty in initiating an SAE project, especially placement projects. Simultaneously, SAE employers active on the program’s advisory committee described students demonstrating low awareness of appropriate job seeking behaviors and skills. In response to these observations, members of the program advisory committee developed a presentation for freshmen and sophomore agricultural education students called “Grip and Grin” which was first delivered in early spring 2015. These committee members created a PowerPoint presentation which was delivered to freshmen and sophomores regarding how to successfully find a job. In subsequent years, the program was revised to provide students individualized feedback from advisory committee members. The Grip and Grin program is now in the third year of implementation.

## How it Works

Members of the agricultural education advisory committee collaborated with the agricultural education staff to identify key knowledge and skills which students needed to know to be successful in obtaining employment. Three of the advisory committee members who also served as current SAE employers spearheaded the effort to design the format of the Grip and Grin session and then subsequently delivered the program to freshmen and sophomore students enrolled in agricultural education. During the initial delivery in February 2015 topics covered in the Grip and Grin session included how to find a job, résumé development, job application and interview process, and relevant tax knowledge. At the conclusion of the PowerPoint presentation the three employers helped students practice professional introductions and handshakes. After the employers left, students crafted résumés in accordance to the guidelines and template provided to them, which were then graded by the agricultural education staff. In 2016, the program was revised so that the agricultural education staff (not the advisory committee members) delivered the Grip and Grin PowerPoint to only freshmen students. Additionally, agriculture education staff delivered the “You’re the Boss” lesson plan available from the National FFA Organization to help students prepare résumés prior to working with advisory committee members. A few weeks after developing these résumés and reviewing the Grip and Grin PowerPoint, six advisory committee members followed up with all freshmen during class time. During these follow up sessions students received individualized feedback on their résumés

from advisory committee members and also participated in mock phone interviews. These same advisory committee members presented a different presentation to sophomore classes on the same day. Instead of focusing on how to obtain a job, they focused on how to keep a job or how to change employment without burning bridges. The Grip and Grin program is now underway for the 2017 – 2018 year following the same design as the 2016 program.

### **Implications**

The agricultural education staff reported students responding very positively to the feedback from advisory committee members, demonstrating increased awareness of appropriate employment behaviors, as well as increased confidence. Seevers and Rosencrans (2001) identified involvement of volunteers as “a way to broaden the knowledge base available to students and allow teachers to focus on other areas” and that their expertise should be capitalized upon whenever possible (p. 79). Incorporating members of the advisory committee who run an agricultural business allowed the agricultural education staff and students to benefit from direct industry experience, as well as creating more program buy-in for the members of the advisory committee. Furthermore, Rubenstein and Thoron (2015) suggested that teachers who provide school resources to students can help increase student participation in SAE programs. Implementing Grip and Grin can help other school-based agricultural education programs boost student participation and success in SAE. Sorensen, Lambert, and McKim (2014) identified “utilizing a local advisory committee” as a top inservice need of agriculture teachers with less than five years of experience. Implementing a program like Grip and Grin could provide structural support for beginning agriculture teachers unsure of how to use an advisory board. Finally, with the increased focus upon college and career readiness nationwide, the Grip and Grin program can foster development of employability skills necessary to develop college and career readiness within the context of school-based agricultural education.

### **Future Plans**

Advisory committee members participating in the Grip and Grin program at Nonnewaug High School continue to be excited about the opportunity to share knowledge with agricultural education students as well as helping students develop skills to obtain a job. Agricultural education staff plan on continuing this very successful partnership so that future students can benefit from the Grip and Grin program. Currently all Grip and Grin efforts target freshmen and sophomore students, but the agricultural education staff are presently developing targeted instruction for junior and senior students to aid in the transition to life after high school.

### **Resources Needed**

To implement this program, agricultural education staff should work with their local advisory committee to identify opportunities for committee members to share expertise with students. Providing students with one-on-one feedback requires these volunteers to attend school, and may mean incorporating their presence into the curriculum. Agricultural educators should collaboratively develop a lesson that best fits the needs of their particular students, community, and industry, drawing upon the feedback from these various stakeholders. The FFA Lesson Plan “You’re the Boss” which was used in the delivery of this program is available for free download at [https://www.ffa.org/SiteCollectionDocuments/myjourney\\_build\\_youretheboss.docx](https://www.ffa.org/SiteCollectionDocuments/myjourney_build_youretheboss.docx).

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## **In a SNAP: Nutrition Education in Food Desert Communities**

### **Introduction/Need for Innovation or Idea**

In 2016, 16.5% of American households were located in a food desert (USDA, 2017). A food desert is a location in which a geographic area lacks access to healthy and affordable food in the form of full service supermarkets or grocery stores. The majority of food deserts are also in areas with high poverty rates (Jiao, Moudon, Ulmer, Hurvitz, & Drewnowski, 2012). Studies report correlations between food deserts and increased risk for various health conditions and diseases, obesity, and a decreased understanding of nutritional knowledge (Thomsen, Nayga, Alviola, Rouse, & Heather, 2016; Wright, Donley, Gualtieri, & Strickhouser, 2016). These risks are present for people of all ages (Thomsen et. al, 2016). In addition, studies indicate that children who live in food deserts tend to have poor academic performance and score lower on IQ tests (Florence, Asbridge, & Veugelers, 2008; Frndak, 2014; Reed, Dancy, Holm, Wilbur, & Fogg, 2013).

While providing access to healthy and affordable food to all citizens is vital to solving the issues related to food deserts, it is not the full solution to these issues. To combat the negative effects of a food desert on a community, it is important to ensure fresh and healthy food *and* nutritional agriculture education programs are available to those residents to foster a culture of incorporating healthy foods into their diets (Frndak, 2014). Furthermore, participation in agricultural education programs which focus on food production fosters a preference for consuming vegetables when compared with students not in agricultural programs (Duncan, Collins, Fuhrman, Knauft, & Berle, 2016). Additionally, residents of the communities in a food desert must serve as advocates for themselves in the development of such educational programs (Block, Chavez, Allen, & Ramirez, 2012). Thus, community based food projects present a unique opportunity for educational programs and food activism to occur in food deserts (Born, 2013). Due to a large portion of the community being located in a food desert, the “In a SNAP” program was developed to address this issue (USDA, 2017). “In a SNAP” is a collaboration between the University of Kentucky, FoodChain, and Elmwood Stock Farm.

### **How It Works/Methodology**

“In a SNAP” was conducted between June and August of 2017 and functioned as a true collaboration between a University of Kentucky agricultural education faculty, an agricultural education undergraduate, and FoodChain, by using the strengths of each partner to bring fresh food to the members of the community living in a food desert. The purpose of this project was to provide local, healthy, and affordable food while simultaneously educating the community about the importance of nutrition, food production, and food consumption. This was achieved by selling five-dollar grab-bags stocked with local vegetables and informational pieces. Additional educational programming, designed by the agricultural education undergraduate, instructed consumers on how to properly prepare the produce and the health benefits associated with consuming the specific ingredients. The distribution point for the grab-bags was a weekly farmer’s market located in the center of a Lexington food desert. Located next to a bus stop in a residential area, the market provides high accessibility to community members in the food desert.

The five dollar grab-bags were priced artificially low due to the produce being surplus products from a local farm. Before the start of the Farmer’s Market season, a survey was

conducted to gauge the interests of community members for the types of produce in the grab-bags. Results allows FoodChain to cater to consumer demand by requested specific types of produce from Elmwood Stock Farm. Workers at FoodChain stuffed grab-bags and added recipe and nutrition information cards. Each week, fliers advertising the grab-bags were posted within the servicing neighborhood. Live tastings, product giveaways, and demonstrations occurred at the booth to provide agricultural education programming to community members. Each week, inventory of the bags was taken and recorded to determine overall results and success of the program. All proceeds from “In a SNAP” will be reinvested in the program for 2018.

### **Results**

During this 16-week program, 113 grab bags were sold to community members for five dollars each. Thirteen bags were sold to non-neighborhood members for 12 dollars, for a total of 126 grab-bags sold. On average, seven bags were sold per week to neighborhood members and one bag was sold per week to non-neighborhood members. In total, 1,008 pounds of produce were packaged and sold for 641 dollars. A recipe card for at least one type of produce in the grab bag was included each week. Four giveaways were held, each time giving an item which could be using in the preparation or consumption of the produce (i.e. knife-sharpener, salad dressing). Tastings were held three times and included fresh produce and recipes utilizing the produce. Local extension agents presented additional programming on two occasions. As awareness of the program increased, community members who were physically unable to visit the market began placing orders with FoodChain to deliver grab-bags and nutritional education materials to their homes. Thus, the program created additional opportunities for agricultural education to occur in non-traditional settings.

### **Future Plans and Advice**

The program plans to introduce the use of an electronic benefit transfer (EBT) machine to assist in making healthy, local, and fresh products more accessible. The grab-bag booth will serve as an EBT checkpoint, allowing the members of the community to use their SNAP benefits to purchase the grab bags and other products being sold in the farmer’s market. Allotting time to ensure the equipment is functional and all state requirements are met before the start of the program is important as it proved to be a challenge this year. Branding for the program should be increased to raise awareness and participation in the program.

### **Costs/Resources Needed**

“In a SNAP” was awarded \$3,500 through a University of Kentucky undergraduate service grant. The undergraduate student who coordinated this program was given a stipend of \$1,000.00, which covered all labor costs. The student worked approximately 15 hours each week for 16 weeks. Professional printing costs (i.e., fliers, yard signs, stickers) used for marketing the program totaled 779.81 dollars. The yard signs and stickers were purchased in June and utilized for the duration of the project, while new fliers were developed each week. Programmatic costs (i.e., recipe cards, giveaways, popsicle molds, ingredients for tastings, gift certificates for guest chefs) totaled 914.40 dollars. The materials for the set up at the Farmer’s Market (i.e., tent, tables, table cloths), collectively cost 502.77 dollars. While it was unable to be used in this season, the EBT machine needed to accept SNAP benefits was purchased for use next year at a cost of 300.00 dollars. In total, \$3,496.98 was spent on this program. The money that was raised will be reinvested in the program in 2018.



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**Integrating Experiential Learning into Ag Reporting and Feature Writing Coursework to  
Develop Metacognitive Skills and International Relations**

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## **Integrating Experiential Learning into Ag Reporting and Feature Writing Coursework to Develop Metacognitive Skills and International Relations**

### **Introduction**

Traditionally, experiential learning involves one or many of the following methods: apprenticeships, internships, work-study programs, field projects and laboratory experiences (Kolb, 2015). Baker and Robinson (2012) theorized that meta-cognitive skill development occurs through experiential learning opportunities. The meta-cognition levels of students can be informally assessed by monitoring the planning, persistence and self-direction skills exhibited by students during their experiential learning experiences (Baker & Robinson, 2012). Presenting students with the tools and a tangible problem to solve allows for upper tier learning processes, such as analysis, synthesis and evaluation, to take place (Krathwol, Bloom, & Mesia, 1964).

Priority three of the AAAE's National Research Agenda highlights the increasing need for trained and skilled agricultural students in the global workforce to develop solutions for current agricultural issues. Priority four of the agenda stresses that agricultural courses should "engage the learner in the process, and not just as the recipient of knowledge" (Roberts, Harder, & Brashears, 2016). Creating engaging and challenging learning environments for agricultural students prepares them for the workforce. Embedding international exposure is an additional component to prepare students for the increasingly global economy, and such opportunities are thought to develop students' global attitudes towards cultural diversity (Bettis, 2015).

This innovative approach to teaching agricultural news writing linked students with opportunities to write about agricultural issues and topics for national and international farm news publications. It also allowed students to engage with real world problems, interact with international clients, and participate in a value-added learning experience, all while developing skills in agricultural news reporting and feature writing.

### **How It Works**

Though the experiential learning process was simple in its execution, there was ample preparation prior to introducing students to the process in the classroom. Experiential assignments were created to ensure students are fully qualified to successfully integrate into the agricultural workforce. Over 16 weeks, the course instructor incorporated lectures, in-class writing workshops and peer editing activities to prepare for three news story assignments. The assignment expectations were designed to mimic industry deadlines and expectations. The instructor partnered with the news editors of one regional and one international publication to gather news topics that the publications would find relevant and useful to their readers. Students participated in lectures, discussions and in-class writing activities for the first three weeks of the course, allowing them to grasp the basics of news writing and AP style before attempting their first news story assignment. Lectures were structured around the inverted pyramid, writing news leads and headlines, AP style grammar and how to conduct journalistic interviews. Armed with these skills, students were then introduced to the editor of the regional and international publications, who (through Skype calls in the classroom) conducted editorial staff meetings, in

which they highlighted the topics they wanted covered and the potential angles for those stories. Stories for the regional publication focused on practical advice for livestock producers. Stories for the international publication focused on national issues facing farmers in the U.S, and how those issues affected operations on the farm. All student work, once graded and edited, was considered for publication, and students whose stories were used in the regional publication signed contracts so they could be paid for their work.

### **Results to Date/ Implications**

Though the course has been taught three times since 2013, this was the first year this industry collaboration has been implemented to strengthen experiential learning. To date, four students' stories have been published in the *Ozarks Farm and Neighbor*. The students have been paid for their stories as contract writers. The *Farmers Guardian* has plans for a series of columns about US perspectives of agricultural issues to begin in early 2018. Both cooperating editors report being pleased with the depth and quality of the students' stories.

The course taught meta-cognitive skills, including approaches for finding viable, valid sources and self-direction skills. Students were expected to match the editorial styles of both publications, and were encouraged to synthesize information from past publications to model in their own stories. Although the international publication is in English, there were still barriers to be overcome, including matching the writing style of another culture (British English vs. American English) and understanding how the meanings of certain words and phrases are affected by cultural differences. International relations were maintained through discussions between students and the editor at the international publication, creating a greater awareness of global perspectives of agricultural issues.

### **Advice to Others**

Instructors are encouraged to reach out to current contacts or develop professional relationships with editors, who, in this case were extremely motivated to incorporate student writing into their publications. Instructors must begin collaboration with editors well in advance of the class to accommodate the editors' deadlines. This is important to keep in mind when designing course curriculum and creating a working environment for the students. The editor should be able to meet with the class, either in person or by Skype. Face-to-face interaction enables students to ask questions concerning the publication and their topics. Having a list of topics for the students to choose from provided by the editor also allows students time to do extra research if a topic is unfamiliar to them.

### **Costs/Resources Needed**

The Agricultural Reporting and Feature Writing course structure incurs no extra costs for instructors or students. One publication agreed to pay students current freelancing rates for their printed stories. While not all publications will pay students for their work, both the opportunity to be paid and/or earn journalistic bylines act as a positive culmination to the writing experience. The course structure does require the instructor to cultivate a relationship with publication editors, local or abroad, who are willing to speak with college students and provide relevant topics, as well as publish the work of the students.

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**Model Trailer Wiring Lesson**

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## **Model Trailer Wiring Lesson**

### **Introduction / Need for Innovation**

Folding STEM concept learning into agricultural laboratory skill acquisition remains a popular topic of discussion among agricultural educators at all levels. Stubbs and Meyers (2015) encouraged preservice teachers to practice developing and delivering STEM integrated lessons. Electricity and electrical wiring have been two of the greatest areas of need expressed by beginning teachers in the agricultural mechanics content area (Washburn, King, Garton, & Harbstreet, 2001). Agriculture, food and natural resources (AFNR) teachers are expected to possess the competencies, knowledge, and skills, to teach basic alternating current (AC) and direct current (DC) electrical concepts and skills to their students (National Council for Agricultural Education, 2015). Even though 98% of AFNR teacher preparation programs indicate that electricity exists in their state's curriculum, fewer than 10% of AFNR teacher preparation programs require a content-specific course in electricity (Burriss, Robinson, & Terry, 2005). In our experience, pre-clinical teachers demonstrate low levels of readiness in several areas of the agricultural mechanics curriculum, specifically electricity and electrical wiring. Beginning teachers have indicated that electricity is the area of greatest need for in-service in agricultural mechanics (Garton & Chung, 1996).

The use of simulation models has proven to be useful in the agricultural mechanics laboratory (Agnew & Shinn, 1990). This model was first observed by the authors when demonstrated by Dr. Curtis Langley at the 2017 Vocational Agriculture Teachers Association of Texas (VATAT) conference. The model serves as a teaching aid for knowledge and skill attainment in direct current trailer wiring. With laboratory space and budget limitations, AFNR teachers are seeking strategies and tools to effectively teach with limited resources (Baker, Thoron, Myers, & Cody, 2008). Often teachers wait to teach trailer wiring until a full-size trailer, a student or class project, becomes available to use as a demonstration.

This model trailer innovative idea is intended to provide teachers with the tools and strategies to teach DC trailer wiring, incorporating STEM concepts, without the need for a full-size trailer. Students actively participate in wiring a scaled model while progressing through the complete lesson, providing a holistic and integrated scenario of trailer lighting concepts and skills.

### **How it works:**

As part of a complete lesson on trailer lighting, a model trailer is constructed and wired. The model presented was constructed of aluminum to reduce weight. The plans included in the lesson use mild steel for constructing the model to reduce cost. Complete construction plans and diagrams for a model trailer, measuring 28" X 16" are provided. The frame is constructed of 1½" angle material. A raceway for electrical wiring, made from ¼" wire loom, simulates protection of wiring beneath the frame of the trailer. The lights used in the model are ¾" red and amber LED trailer lights with rubber grommets. Other required materials include approximately four feet of bonded 4-flat trailer wire, a 4-flat trailer connection, electrical soldering materials (soldering iron, flux, acid brush, acid solder), and heat shrink tube.

The lesson will include a student activity in diagramming DC circuitry for common trailer wiring applications. Using this student-created electrical diagram, students will then complete an appropriate and functional electrical circuit for lighting the model trailer; this can be done individually or in small groups. For the hands-on wiring activity, the model trailer will

serve as a realistic scale model for a full-scale trailer. The evaluation activity in the lesson calls for students to test their completed lighting circuit on the model trailer by connecting to a trailer test control unit using an authentic vehicle trailer connection. The control unit will consist of a power supply, flasher modules, and five switches emulating the lighting controls found in a vehicle (brake lights, turn-signal lights, marker lights, and hazard warning lights).

### **Results to date:**

The model trailer lesson was developed and pilot tested with pre-clinical teachers in the fall of 2017 at Texas A&M University. The pre-clinical teachers participated in a classroom activity introducing the Texas trailer lighting requirements, followed by the laboratory exercise. As part of the lesson evaluation, students shared previous knowledge and experiences with trailer wiring. One student shared “I built a 6’x10’ utility trailer my senior year. It still does not have lights on it because I never knew how to do this.” In this first sample (n=14) of pre-clinical teachers at Texas A&M University, 71% of the students reported being not familiar at all or only slightly familiar with trailer wiring before the laboratory activity. Following the activity, 86% of the students participating indicated they would feel somewhat or extremely comfortable in teaching trailer wiring to their students. The model trailer project presents a solution for teachers teaching with limited resources and large classes. The skills learned using the model trailer are intended to transfer to full-scale projects (Carroll, 1963). The results of the pilot test suggest further research should be conducted to ensure skills acquired using the model trailer transfer to full-scale projects.

### **Future plans / Advice to others**

We intend to create additional curriculum resources for the model trailer project and implement professional development opportunities. The model trailer project contains two components, model construction, and the trailer wiring exercise. Model construction provides an opportunity for teachers to engage students in metalworking and general agricultural mechanics skills. A comprehensive lesson plan and materials packet for teaching model construction and trailer wiring will be available online. We plan to continue providing instruction using the model trailer project to pre-clinical teachers at Texas A&M University.

The model construction and wiring lessons will be included in one of the professional development opportunities on the campus of Texas A&M University in the summer of 2018. At this event, teachers will participate in the design and fabrication of the model trailer, and in using a sample lesson incorporating the model trailer as a classroom teaching aid for trailer wiring. Teachers will have the opportunity to take home their model trailer, and all the resources for teaching trailer wiring in their classrooms.

### **Costs / Resources needed**

The cost associated with the model trailer project can be separated into two laboratory exercises, model construction and trailer wiring. The model trailer could be constructed ahead of time by the instructor, or completed as a laboratory exercise by the students. The materials cost for construction of one model trailer is approximately \$30. Materials for the trailer wiring laboratory exercise costs less than \$5 per model trailer. Metalworking tools and welding equipment are needed to construct the model trailer. To complete the trailer wiring exercise, a teacher would need electrical wiring hand tools and soldering equipment.



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**Optimizing Professional Networking through a Preparation Program for Students**

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## Optimizing Professional Networking through a Preparation Program for Students

### Introduction

Professional development conferences provide a new experience for students. Some may have attended leadership conferences, but few have experienced a true professional development activity. As a result, many experience anxiety about what to expect, what to do, and how to act. In addition, even if they are not anxious, most undergraduate students are not equipped to get the most from networking opportunities at these conferences.

This student need aligns with the National Association of Colleges and Employers (NACE) career readiness competencies. The organization defines career readiness as “the attainment and demonstration of requisite competencies that broadly prepare college graduates for a successful transition into the workplace” (National Association of Colleges and Employers, 2017, par. 3). The organization further explains eight competencies students should have to establish their career readiness. For this discussion, the competencies of oral/written communications and career management are the focus for student development (NACE, 2017).

The foundation for this idea came from researchers at Purdue University. The researchers at Purdue sought to determine if an organized preparation process would help students optimize their time at professional development conferences. The researchers implemented a formal course for students to help facilitate their experiences before, during, and after the conference. At the end of the course, researchers concluded, “formal preparation for attendance at a national scientific meeting maximizes the potential for students to benefit from their experience” (Flaherty, Day, D’Acunto, Zollner, & Quinn, 2017, p. 50).

Researchers for this study sought to determine if the same benefit could be realized for students who participated in a program associated with a student organization, rather than a formal class. For this process, the researchers worked with students in the Agricultural Communicators of Tomorrow (ACT) organization in preparation for Ag Media Summit (AMS). AMS is the professional meeting for two professional agricultural communications organizations as well as the national meeting for ACT and provides professional development and networking opportunities for students.

In addition to meeting the competencies of NACE career readiness, this innovative idea provides research opportunities aligning with the AAEE National Research Agenda, Research Priority 4 (Roberts, Harder & Brashears, 2016).

### Program Steps

Eight undergraduate students participated in this inaugural program. Six were seniors, one was a junior, and one a sophomore; and all were majoring in agricultural communications. Three of the eight participants previously had attended AMS. However, none had participated in this type of program. The structure of the program was three-fold: before, during, and after.

**Before:** Students were asked to submit to advisers a brief statement explaining what they hoped to learn at the conference, a personal schedule of sessions to attend, and a résumé and cover letter to be critiqued by an adviser. In addition, they were asked to identify three people and/or companies to meet during AMS as well as contact at least one prior to the conference to schedule a time to meet. Finally, students and advisers met before the conference started to provide an overview of the event and answer any questions.

**During:** While at the conference students were expected to carry résumés and business cards with them, meet at least two ACT members from other universities, meet with the

people/companies they contacted before arriving at the conference, meet with alumni of Oklahoma State University at the scheduled alumni event, attend workshops, spend time in the Info Expo, post to the Optimizing AMS private Facebook group, and attend all ACT meetings and functions. The advisers also led a debriefing session each night.

**After:** When the conference ended, participants were asked to send follow-up emails to at least three professionals they met, share their experiences at an ACT meeting, and attend a debriefing meeting with all participants and advisers. For the research aspect of this process, the debriefing process was structured as a focus group.

### **Results**

Results from the focus group indicate the program was a success. A reoccurring theme throughout the focus group discussion was that students were not as diligent with their preparation as they should have been, a decision they regretted after the event. However, all students benefited from the program, no matter what level of preparation they put in. “I think this provided a good blueprint for what to do when you go to another conference, even if it’s not AMS,” one of the participants said.

During the conference, students said the debriefing sessions were the most helpful. One student said, “having [meetings] every day, it’s like keeping a journal except you’re talking about it with people. But I think having it every day allows you to process all the events a little more thoroughly and likely more effectively than just meeting once at the very end.”

The last reoccurring theme for participants was the benefit of an alumni event at the conference. Students appreciated being able to approach someone they knew had a common interest: their alma mater. This connection helped them overcome anxiety about reaching out to someone they did not know.

### **Resources/Future Plans/Advice**

No direct costs are associated with this program, only the resource of faculty members’ time, which makes its sustainability possibilities high. In the future, this program should be conducted on a yearly basis for AMS. In addition, the effectiveness should be measured for other professional development conferences. Time also should be spent on ways to show students the relevance of the preparation process before attending their first conference.

A suggestion for future implementation is for advisers and students to meet, whether in person or via technology, one-on-one before the conference. This meeting would be used to review their résumés and identify potential professionals to contact. Students from this program shared they were unsure how to find individuals to contact. While a registration list was shared with all attendees, the list only included names and companies. Job titles were not included, which is what many students looked for, as many were more interested in a specific position rather than a specific company.

The post conference discussion led to an unexpected finding about a gap in the department’s curriculum. Students shared a desire to receive more information about career opportunities with a degree in agricultural communications. Several students voiced their frustration of not being able to articulate what their future career goals are because they did not feel well versed in the possibilities. This discussion brings to the surface the need for discussion about agricultural communications careers as well as the need for finding a way to share this information with students whether in a formal classroom or through student organizations.

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## **Introduction**

Teachers reported that when using technology in their classroom, students were more engaged and it also made them better teachers (Downes, Bishop, 2012). However, it is was found that technology use in the classroom is low (Muir-Herzig, 2003). It has been expressed that in-service teachers need more preparation on how to integrate technology in their classroom (Russell, Bebell, O'Dwyer, O'Connor, 2003). Plickers is a way to incorporate technology in the classroom and a way to increase student involvement. Plickers are a free online resource that is easy for educators to use and incorporate into their classroom. It is a resource that allows students to submit answers using a piece of paper and an instructor's smart phone. A similar technology application that is not free to instructors or students, clickers, have shown to encourage participation and motivate students to answer questions correctly (Filer, 2010). Coley, Warner, Stair, Flowers, Croom (2015) found that when taking a survey of how agricultural educators in Tennessee acquire knowledge about technology, undergraduate coursework contributed to a small extent. This shows a need for universities to incorporate more technology training into teacher education.

## **How it works/Methodology**

Instructors log onto the Plickers website and begin by creating a class. To create a class instructors will type in the names of each student and assign them a card number. Instructors will then print out a set of cards and give students their corresponding card number. The instructor may create questions the students will need for test review. The questions can either be multiple choice or true and false. This is one of the downsides of Plickers. After the questions have been created related to the test review the instructor can then use them as a form of formative assessment. The instructor will then post the questions for the students to see, and the students will respond to the question with their Plickers card. The instructor will need to have their smart phone with the Plickers device. Answers will be recorded this way. The instructor will then scan the room using their smart phone and the Plickers application. The answers will then be recorded and reported to the instructor in a detailed manner which shows which students got the question right or wrong, and what percentage of students answered the question correctly. The instructor can then use this informative to see if any questions need to be revisited before the students take the exam. This can be a great tool for instructors to use to see if they need to revisit the way they are teaching a certain topic, if many students are not able to answer the question correctly. This is also a way to see if a question is confusing to students. If it is it may need to be reworded for the exam.

## **Results/Implications**

During the 2017 spring semester Plickers were used by a preservice teacher as a way to review for a test on many occasions. Each time students were very engaged in the review, and even asked if we could use the Plickers to review. Students test scores reflected that the Plickers were beneficial. The preservice teacher reported Plickers were a wonderful tool to use as a way of formative assessment their teaching. The preservice teacher reported that many times if a majority of the class would miss a certain question in the review, they would reteach the concept with a different approach. This aided them in the word choices they would use to generate test questions. They feel this helped them in developing their ability to create an exam that students would be able to easily understand the questions, and it would challenge students at the same time.

## **Future Plans**

Many teacher educators, in-service, and preservice teachers are unaware of Plickers and the benefits it could have for test review. It could be very beneficial for the use of Plickers to be incorporated into teaching methods curriculum at a university level. Teacher educators at [university] plan to incorporate the use of Plickers in their curriculum. By doing this we could spread the word about the benefits of Plickers to many preservice teachers. It would also be of great benefit if a workshop could be created for in-service teachers on how to use Plickers for test review. Since this is a free resource to teachers it is important we educate them on an easy ways to use Plickers as a technology resource in the classroom for test review.

## **Resources Needed**

Plickers are a free online resources for teachers. Instructors may download five different sets of Plickers online. Each set has a different purpose. Such as the set of large Plickers that are great for younger students or anyone who has trouble reading the smaller letters. Teachers can also purchase a set of laminated Plickers for \$20 on amazon if they chose to do so. The online resources and application for Plickers are also free for instructors to be able to create questions and analyze student answers. Other resources that you would need would be the Plickers would be a smart phone to download the application (around \$600), a projector (around \$300), and a computer around \$600. However, most instructors will already have these materials.

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**Poster Session in a Methods of Teaching Course: A Poster Poster**

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**Poster Session in a Methods of Teaching Course: A Poster Poster**

**Introduction/Need for Innovation or Idea**

The Individuals with Disabilities Education Act, (IDEA), enacted in 1975, mandates that children and youth ages 3–21 with disabilities be provided a free and appropriate public school education. According to the National Center of Education Statistics, as of 2015, the number of students served by IDEA was 6.6 million or 13% of all public school students (U.S. Department of Education, 2017). Given that 95% of students served by IDEA are enrolled in regular public schools rather than separate schools for students with disabilities (U.S. Department of Education, 2016), and that students with disabilities in secondary Career and Technical Education Programs were found to be less likely to drop out and more like to be employed after high school (Cobb et al., 1999, Colley & Jamison, 1998), Teacher Education Programs around the country must take steps to prepare their pre-service teachers to educate diverse learners.

This fall, one Teacher Education Program in Kentucky implemented a new, innovative way to prepare their pre-service School-Based Agricultural Education (SBAE) teachers to educate diverse learners in their future classrooms. This idea aligns with Research Priority 5 of the 2016-2020 American Association for Agricultural Education Research Agenda: Efficient and Effective Agricultural Education Programs.

**How it Works/Program Phases/Results to Date**

Agricultural Education students at the University of Kentucky are required to take a Methods of Teaching Career and Technical Education course during the semester prior to their student teaching experience. This class hones skills pre-service teachers will need to be successful in the classroom while providing a positive learning environment for all students. A unit on teaching to students with disabilities and diversities has always been in the course, but this year the unit was redesigned in an innovative way. In this activity, these senior students created a research-style poster on strategies for teaching to a provided student disability or diversity, and hold a poster session with their classmates in order to deliver the information. Program phases are as follows:

Phase One (Three Months Before): students were randomly assigned a specific disability or diversity to research, and informed of these specific topics to focus their research efforts:

Characteristics or Symptoms, History of Diagnosis/Where Term Was Coined/Treatment Options, Strategies to Teach to the Student, Modifications (if needed), and Resources for the Teacher

Phase Two (One Month Before): students were provided a University-approved poster template to input their research into

Phase Three (Two Weeks Before): University faculty, staff, and other students were invited to attend the poster session

Phase Four (One Week Before): Teaching Assistants received final copies of students' posters electronically, then had the posters printed by the University of Kentucky College of Agriculture, Food, and Environment poster printing service

Phase Five (Day Of): students assembled and set up their own posters and held the poster session during the usual one-hour time period allotted for their class

Phase Six (Following Week): student posters printed on regular 8.5x11" paper and assembled into a packet, distributed to Methods students for future use

Students in this Methods of Teaching Career and Technical Education course thoroughly enjoyed the experience of creating and presenting research posters as a means of learning about teaching to diverse learners, with one stating that it “allowed [them] to create dialogue that shed light on so many different kinds of learners and equipped [them] with skills that [they] can utilize to give all students the education they deserve,” and another describing herself as now “confident in teaching to diverse learners in the classroom” (Methods students, personal communication, October 23, 2017).

### **Future Plans/Advice to Others**

Upon completion of this poster session, instructors of the University of Kentucky Methods of Teaching Career and Technical Education course posited a number of improvements to the process in years to come, which should be used as advice to other institutions wanting to conduct a similar activity in their own Teacher Education Program. The first and most important improvement is to provide a more structured rubric or set of guidelines for the poster and poster session. It would benefit the pre-service educators to have this, considering many of our undergraduate students may have never experienced this advanced level of research. In addition, the ability to view examples of acceptable posters would benefit the students in their preparation as well as increase quality of work submitted by students.

When planning the activity during Phase 1, the instructors plan to inform the poster printing service of the date the posters will be needed, so they have plenty of time to plan to meet this order. Additionally, a large enough space to accommodate posters as well as the participants is needed. This innovative idea was conducted in the lobby of a building with many passersby; in the future one would ideally host in a less traffic-heavy area. Furthermore, the instructors plan to split the poster session up into two class periods with half the students presenting each day, in order to give the students the opportunity to learn from their colleagues.

### **Cost/Resources Needed**

A poster session of this scale is relatively inexpensive and simple to conduct. University of Kentucky faculty have access to free poster printing, however this may not be the case in other institutions and the Teacher Education Program would need to absorb the cost of printing. Further resources to purchase include poster boards to bolster the research poster, as well as easels to display them. Refreshments were provided for guests attending the student poster session, which added value to the presentation but is not a crucial cost to the operation. The involvement of faculty and staff from the University was a key component of the poster session. Therefore, conducting the poster session in an environment that is conducive to the participation of guests requires the resources of time and space to organize the posters at a time that is convenient to faculty schedules, in a location that is open and welcoming to conversation.

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**Recruiting through Agricultural Education's Family Trees**

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## Recruiting through Agricultural Education's Family Trees

### Introduction/Need for Idea

The shortage of qualified agriculture teachers has been well documented (Smith, Lawver, & Foster, 2017). As a result, efforts have been made at both the state and national level to promote careers in agricultural education and encourage students to consider teaching agriculture (<https://www.naae.org/teachag/index.cfm>). The National Teach Ag Campaign has launched a variety of initiatives, such as National Teach Ag Day and the Future Agriscience Teacher symposium. As well, the Teach Ag website provides numerous ideas and suggestions for identifying, nurturing, and supporting future agriculture teachers. Teacher education faculty across the country have also been responsible for several innovative efforts to recruit and encourage potential teachers. Examples include an Agricultural Education Institute (Thoron, Osborne, Myers, Barrick, Roberts, & Dyer, 2016), letter of intent signing day (Thoron et al., 2016), Teach Ag! Avengers (Foster, Ewing, & Rice, 2015), and agricultural education instructor trading cards (Gerwig, Falk, & Touchstone, 2015). While these activities focused on high school students, they did serve as the impetus for the introduction of several new Teach Ag activities in [State] focused on the recognition of beginning and established teachers. These activities also created a collegial team environment of support, areas found to be linked to retention and job satisfaction (Darling & Hammond, 1997; Friedman & Kass, 2002).

### How It Works

Teacher preparation faculty at North Carolina State University developed an idea to recruit future teachers by recognizing the North Carolina Ag Ed Family Trees. In spring 2017, faculty surveyed teachers in North Carolina to determine where they attended high school if enrolled in an agriculture program, where they student taught, who among their students became teachers, and who they mentored as student teachers. To date, of the 518 teachers in North Carolina, 355 have completed the survey for a response rate of 68.65%, inclusive of even first-year teachers hired after May 15.

In June 2017, we selected a design for the family tree posters and created the template in Microsoft PowerPoint. The design included a visual tree where the teacher's own agriculture teachers and cooperating teachers formed the roots of the tree. The teacher's own high school students who became agriculture teachers and his or her student teachers are arrayed in the branches of the tree. We included the first line of the *Ag Teacher's Creed* and part of the FFA Advisor's part of opening ceremonies on the poster. Finally, the Teach Ag logo and the sponsors of Teach Ag were added to the posters. Finally, the 11x17 posters were framed in a matte black frame.

We distributed 38 of the North Carolina Ag Ed Family Trees to our teachers at the summer teachers' conference. We arrayed them on a table outside of the main ballroom. As teachers filed into the room, they stopped and discussed the Family Trees, where people student taught, and who they mentored. Because of the high level of interest, we hustled to complete the

next ~250 to be disseminated at the fall regional inservice meetings. As the next batch of Family Trees was disseminated at the regional inservices, even more teachers supplied their information, so we have 50-70 Family Trees to complete and disseminate. To date, we have printed and disseminated 267 Ag Ed Family Trees. At dissemination, we encouraged teachers to hang their framed Ag Ed Family Trees in their classrooms. We also encouraged them to ask prospective and promising future teachers in their classes, “Who among you will be my next (or first) branch of my NC Ag Teacher Family Tree?”

### **Results to Date/Implications**

Results of the efforts have been both quantitative and qualitative. From a quantitative perspective, teachers appear to be more encouraging of their students to consider teaching this fall. A teacher emailed, “After hearing your presentation yesterday at in-service I wanted to send you a name of a current student of mine who is interested in Ag Ed.” To date and while certainly not confirmed with robust research methodology, the agricultural education program coordinator at our institution has received 12 emailed recommendations from different teachers of prospective agricultural education students, compared with zero recommendations over the same period in 2016. Teachers have posted their trees to social media and recognized their students and student teachers via the Family Trees. We have received written feedback from teachers, with one remarking, “I just wanted to say that your tree meant more to me than about any other award I have received in my teaching career.”

### **Future Plans/Advice to Others**

Annually in the future, we will update the Family Trees of teachers whose own students or student teachers graduate from one of the agriculture teacher preparation institutions in the state. We will develop their distribution and recognition into the awards banquet of the annual North Carolina Agriculture Teachers’ Association summer conference.

When distributing the family trees, meetings with a large number of teachers allows for the easiest distribution. This year, family trees were distributed at summer conference and regional meetings. Also, once the PowerPoint template is populated with Family Tree information, future updates and new trees will require less investment of labor to reprint. Further, maintaining the database of teachers and student teachers should be relatively easy to maintain. This database also holds good potential for research on teacher recruitment and retention.

### **Costs/Resources Needed**

Costs include \$6.00/frame, \$0.75/poster for printing, and \$1.39/poster for labor, for a total cost of \$8.14/Family Tree. The total cost for Ag Ed Family Trees was \$2,173.38. Reprints of Family Trees will cost approximately \$0.75/poster. All materials were purchased with funds from the National Association of Agricultural Educators Teach Ag STAR grant program.

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**Rounding Up Resources for Agricultural Teachers: Utilizing a Blog and Social Media to Disseminate Quality Resources**

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## **Rounding Up Resources for Agricultural Teachers: Utilizing a Blog and Social Media to Disseminate Quality Resources**

### **Introduction/Need for Innovation or Idea**

The Owl Pellets Facebook page was created by university faculty from across the country to serve as a multifaceted, social media extension tool that provides professional development by disseminating current research to practicing agricultural educators. Social media metrics have benefited extension personnel in distributing information and monitoring stakeholder interest and impact (Gharis Bardon, Evans, Hubbard, & Taylor, 2014; Kinsey, 2010). A case study on user engagement was completed after the first year of the Owl Pellets page (Warner, Hassan, Myers, Shoulders, & Baker, 2017). The case study found that more frequent posting led to more user engagement. As a result of these findings, the Owl Pellets team designed a schedule for daily posts to increase user engagement. Each Wednesday, the Owl Pellets page publishes a blog that promotes high quality resources that align with the podcast topic for the week. These resources are designed to help teachers put the ideas discussed by researchers into practice in their classrooms. The Resource Round-Up posts address the recommendation of Guskey (2002) to find creative techniques to support teacher implementation of new education practices gained from professional development. Teachers have acknowledged social media for playing an essential role in their lifelong learning and professional development (Öztürk, Öztürk, & Özen, 2016) and engage with social media daily (Forte, Humphreys, & Park, 2012; Öztürk et al., 2016). It has been recognized for providing teacher autonomy in professional learning (Bissessar, 2014; Carpenter & Krutka, 2015; Edwards, Darwent, & Irons, 2015) and flexibility of access (Bissessar, 2014; Edwards et al., 2015).

### **How it Works**

Each week a theme is identified based upon the research presented via the published infographics and podcasts. Owl Pellets staff search for resources that will facilitate the implementation of the research practices discussed by the researchers. These resources are reviewed and synthesized into a blog post with links and suggestions for use. The blog post is published and automatically shared through Facebook, Twitter, and Instagram social media platforms. Teachers utilize these resources within their own programs and share them with their fellow teachers.

### **Results to Date/Implications**

During the first two months of Resource Round-Up posts, eight posts have been published. Topics of the published posts include: animals in the classroom, internationalizing your agriculture program, increasing teacher effectiveness, building the self-efficacy of students, integrating STEM into your classroom and outreach programs, career counseling, college counseling, and making substitute planning easier. Table 1 provides a summary of the Facebook analytic data of those posts (Facebook, 2016).

Table 1. Facebook insights for Resource Round-Up posts.

	Animals	Internat- ionalizing	Teaching Effectiveness	Self-efficacy	STEM	Careers	Colleges	Sub Plans	Total
Time of posting	14:15	12:51	12:31	7:55	7:54	13:12	6:57	18:26	n/a
People post was served to	721	254	335	1189	3660	861	616	2984	10620
People who saw post	111	83	104	53	587	411	395	1322	3066
People engaged with post	24	3	12	47	58	24	13	156	337
People who clicked on post (unique)	15	2	8	39	40	17	9	143	273
Likes	10	1	4	6	18	9	5	20	73
Comments	0	0	0	0	0	0	0	7	7
Shares	4	1	2	3	11	3	1	7	32

Furthermore, the additional activity on the page has contributed to 446 new page likes during the two-month period, a 28% increase. These posts allow the Owl Pellets team to reach more agriculture teachers across the nation on a weekly basis with professional development resources than the team could consistently reach with extension programs meeting in person. Moreover, teachers are able to access these resources at a time when they are most beneficial for them. The blogs posted in the evening tended to have more engagement and clicks. Additionally, certain topics seemed to garner more interest.

### Future Plans/Advice to Others

The Owl Pellets team plans to continue weekly posting of Resource Round-Up blogs as one method of delivering professional development to ag teachers. As more data points are collected, more thorough analysis will be conducted to determine the optimal posting times for teacher engagement. Additionally, the team is working on gathering topics of interest from teachers so the posts can be designed to meet their immediate needs. If engaging clientele in extension or professional development through social media, page managers should make an effort to post regularly throughout the week (Houk & Thornhill, 2013; Warner et al., 2017). Additionally, page managers should monitor the post and look for trends related to best time to post, types of posts preferred, and content with the most engagement.

### Costs/Resources Needed

The resources used to complete teacher extension and professional development through social media included a Wordpress website; Facebook, Twitter, and Instagram social media platforms; and access to various resources across the internet. All of these can be created at no-cost, although a paid subscription to Wordpress would allow more control over the publishing of the blog. The major investment in this program is time. Several hours must be devoted to finding, selecting, and reviewing high quality resources for each blog post. Additionally, time is required to post, monitor, and respond to posts on social media platforms.

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**Safety, Safety, Safety! Using the Lathe Safety Simulator to Introduce Proper Machinery  
Operation Principles and Work Habits**

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## **Safety, Safety, Safety! Using the Lathe Safety Simulator to Introduce Proper Machinery Operation Principles and Work Habits**

### **Introduction**

Safety remains an important topic in the discipline of agricultural education (Saucier, Vincent, & Anderson, 2014; Schafbuch, Vincent, Mazur, Watson, & Westneat, 2016). As accidents are a frequent possibility within agricultural education settings, particularly agricultural mechanics laboratories, proper training and operational practices on the parts of students and teachers are a must (McKim & Saucier, 2011; Phipps, Osborne, Dyer, & Ball, 2008; Saucier et al., 2014). Moreover, as agricultural mechanics curricula and laboratories remain as staples within many programs (Burris, Robinson, & Terry, 2005), teachers must be prepared to effectively and safely deliver instruction in content areas that include woodworking, metalworking, and so forth (Shultz, Anderson, Shultz, & Paulsen, 2014). Teachers must also have access to adequate tools and equipment (i.e., power tools, training software and hardware, etc.) necessary to prepare the next generation for entry into the workforce (McCubbins, Wells, Anderson & Paulsen, 2016).

Regarding the educational process, simulation has been cited as a useful method of instruction in agricultural education for quite some time (Agnew & Shinn, 1990; Phipps et al., 2008). As such, virtual reality (VR) simulators have been deemed suitable for training purposes beyond the scope of agricultural education as well, including medical practice (Gallagher et al., 2003), welder training (Byrd, 2014; Stone, Watts, & Zhong, 2013), and more. VR simulators used for training purposes can allow users to gain a deeper understanding of psychomotor skill abilities, as well as shortcomings, within a safe and controlled environment (Byrd, 2014; Gallagher et al., 2003; Stone et al., 2013), allowing for minimal risk as users work to improve and hone their abilities within a given context (e.g., tool and equipment operation, process completion, etc.). At the moment there exist few VR simulators designed to train individuals to properly use and work around woodworking and metalworking equipment such as lathes. Perhaps such a simulator could be beneficial in allowing individuals the opportunity to receive useful equipment operation training in a safe atmosphere prior to using a physical machine.

### **How it Works**

Prior to using the Lathe Safety Simulator (LSS), several pieces of hardware will be needed, including a VR headset, ear phones, a base station, hand controllers, and a link box. Each hardware piece provides the user with the ability to interact within the full scope of the VR experience. Through the use of full-immersion VR, users are able to interact with the equipment to complete various tasks. For example, the earphones allow a user to experience realistic sounds, the base station permits a user to move within a predetermined area of space, the hand controllers allow a user to manipulate objects (i.e., levers, knobs, work pieces, etc.), and the headset provides a 360° panoramic view of the work area. The link box serves to connect each piece of hardware together.

The LSS is a VR simulator designed to introduce the concepts of proper machine operations and safety practices within a game-based setting (Valve Corporation, 2017). Users are also given a summary of any deficiencies in their safety habits (Valve Corporation, 2017). Once an individual begins using the LSS, he/she will be greeted by a virtual robot. This robot will explain the features of the LSS and allow the user to select an option for interaction which

includes game overview, lathe overview, lathe safety, turn a workpiece, or missions. The game overview provides a description of the purpose of the game. The lathe overview walks users through the components of the lathe (e.g., chuck guard, chuck, spindle, tailstock, etc.), while lathe safety will outline the steps for safe operation of the lathe. This includes a discussion of proper personal protective equipment, and the steps for loading a workpiece for performing various functions. Turn a workpiece is a free environment where a user can operate the lathe without guided instructions from the robot. The mission portal has various tasks that users can complete. The lounge area has a board that tracks error types (e.g., oversized workpiece, contact with the spindle, drill bit unlocked, etc.), and the number of occurrences.

### **Results to Date**

The LSS was initially piloted at [UNIVERSITY] in an undergraduate work study program for agricultural education students. After the authors tested the LSS and created a suitable set-up for its use, the LSS was then introduced in a methods of teaching course within a unit of instruction on educational technology. All students enrolled in the course were given the opportunity to practice using the LSS. Anecdotally, those who used the LSS expressed an enthusiastic response toward using this type of VR technology to introduce safety and operational procedures for a new piece of equipment. Some concerns, however, were noted regarding the transferability of skills learned through the LSS to the use of an actual lathe.

### **Future Plans & Advice to Others**

The authors of this abstract plan to continue using this technology within the methods of teaching course as well as exploring other VR technologies related to agricultural education. Plans also exist to create, film, and explore additional agriculturally-based settings and concepts. The authors also wish to develop and implement VR technology application training for preservice and inservice agricultural education teachers in the near future. A collaborative examination of the effectiveness of the LSS with a college of engineering at [UNIVERSITY] is currently in development. Regarding hardware, the authors currently use an Alienware PC with HTC VIVE VR technology, but additional ambitions include purchasing a selection of different technology delivery packages, such as the Oculus Rift VR system. The prices for differing VR technologies should be considered depending on circumstances, as lower-cost alternatives are available based upon differing needs. VR technologies may become more cost-effective and attainable as adoption increases.

### **Costs**

Prices for VR technologies vary based upon the type and kind selected for use. The HTC Vive used by the authors retails for \$800.00, which includes a headset, two wireless controllers, two base stations, and one link box for connection to the computer. In order to operate the system, a VR-ready computer is also needed. The authors utilized an Alienware model with a base price of approximately \$2,700.00. As technology advances and becomes more widespread, the price for VR-ready systems may continue to drop. Prices for VR-ready computers have a wide price range. As such, a computer costing approximately \$500.00 may be a more viable option for an agricultural education program. The LSS requires wireless Internet access to operate the system. Fees for Internet access vary depending on the service provider.

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Swivl and GoPro: The use of Video Recorders in the Dale Bumpers College of Agricultural,  
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# **Swivl and GoPro: The use of Video Recorders in the Dale Bumpers College of Agricultural, Food and Life Sciences to Enhance Student Learning**

## **Introduction**

Both technology and online communications are dominant forces in students' lives (Greenwood, 2007). As information technologies have evolved, they have added new environments for teaching and learning while also gaining in popularity (Zhang, Zhou, Briggs, & Nunamaker, 2006). Educational materials are no longer limited to static text due to the use of multimedia materials that harness learner attention and interest (Chen & Sun, 2012). Cornish and Jenkins (2012) stated that teachers who engage in regular critical reflection shape their own development and this self-assessment has led to improved teacher quality. The Center for Teaching Innovation (2017) at Cornell University stated benefits to video usage that included a) stimulate student interest, b) capture geographically distant places, c) connect complex topics to real-world examples, d) accommodate a variety of learning styles, and e) engage students with content outside of the classroom. Furthermore, learners must be engaged in the process of learning by understanding the relevance of information (Edgar, 2012). Video recording usage for students and teachers aims to engage them through the use of technology and also provide relevant information. The Dale Bumpers College of Agricultural, Food and Life Sciences (Bumpers College) seeks to prepare graduates who are intellectually enriched as well as technically competent. Bumpers College has worked for five years to increase international education participation to keep up with the University of Arkansas' goal of 25% international participation by 2020. Yet, the Bumpers College has maintained about 5% international experience participation rate. The utilization of video could aid faculty in agricultural course development and educate students about international opportunities at the Bumpers College.

## **Methodology**

Dr. Kathleen Jogan, an animal science (ANSC) instructor in Bumpers College, implemented the use of Swivl® and GoPro® technology with students in Kentucky (KY), New Zealand (NZ), and Australia (AUS). Dr. Jogan focused on ANSC studies during these faculty-led trips and used Swivl technology in KY and GoPro technology while in NZ and AUS. Upper classman visited KY as an optional learning component for a Thoroughbred Horse Industry course (ANSC 4173). NZ and AUS were visited during a January intersession study abroad course with a focus on indigenous and livestock animal interactions.

Video and voice recordings were made using Swivl. While at the Keeneland racetrack in KY and a horse breeding farm, students introduced themselves and spoke about where they were and what they were doing. A total of six students were recorded for about three minutes each. The purpose of these recordings were 1) to allow students an opportunity to reflect on what was learned, 2) to give future students a chance to hear what their peers learned, and 3) to learn more about Swivl technology. Video recordings in NZ and AUS used two GoPros during a 2017 program. Footage included student involvement (15 students on the program), study abroad excursions, travel, and the countries landscapes. The objectives of these video recordings were 1) to use for study abroad recruitment and 2) to learn more about GoPro technology.

## **Results and Implications**

Video recordings were used by Dr. Jogan for program recruitment and electronic student portfolios if students were interested. Dr. Jogan visited three Bumpers College courses where she

presented the video recordings from the NZ and AUS study abroad program for a total of 3.5 minutes of footage prior to a question and answer session about the program. Furthermore, the use of Swivl and GoPro technology in KY, NZ, and AUS provided the instructor and students with the opportunity to learn skills that align with the Bumpers College mission to teach students to be technically competent.

### **Future Plans**

The use of Swivl and GoPro technologies have the opportunity to expand the understanding of study abroad opportunities, improve agricultural classes, and allow teachers and students to document these experiences in digital formats that can be easily added to electronic platforms. GoPro and Swivl technology has the potential to be critical tools used in engaging students in study abroad opportunities at colleges. Videos could also be used in multimedia presentations alongside flyers, PowerPoint presentations, and study abroad information sessions to utilize what Greenwood (2007) stated to be a dominate force in students' lives. Swivl recordings were used in KY to capture student perceptions of their hands-on learning experience. However, there are more ways to utilize this tool. Portable video recording devices like Swivl and GoPro could be used in diverse settings (barn, field, etc.) to make course lectures, discussions, and tours available for students with excused absences, allowing everyone an equal opportunity to educational content. Additionally, the use of video capturing devices has become more affordable and accessible, however, more needs to be learned about the most effective ways to use these tools to teach agricultural students.

### **Costs and Resources Needed**

The materials and cost of Swivl and GoPro technology depends on how educators plan to use the devices. However, for the purpose of course recordings and study abroad documentation the following are recommended for Swivl and GoPro technology. The necessary software depends on the use of the devices, but free services are available.

The introductory cost of Swivl technology includes the robot, marker lanyard, floor stand, and capturing device (Swivl, 2017). The Swivl C1 robot includes: robotic motion and tracking, a carrying case, primary marker used for tracking an individual, a USB Marker charger, and iOS/Android Cables. The total cost of the C1 Robot package is \$599. Additional markers for hands-free tracking are available for \$179 each or the C3 (3 markers total) or C5 (5 markers total) upgrades are recommended for \$799 and \$999 respectively. The neck lanyard allows for ease of marker device usage and is \$15 per lanyard. The floor stand helps the user find unobstructed space in your room for smooth operation, comes with built in cable management clips, and is .91-1.6 meters (m) for \$99. Compatible capturing devices must be IOS 9+ devices such as: iPhone 7, 7 Plus, 6s Plus, 6 Plus, 6s, 6i, and iPad Pro, Air 2, Air, mini 4, mini 3, and mini 2. The total cost for the Swivl items listed (C1 model, neck lanyard, floor stand, and no capturing device) is \$713.

Items and cost of the introductory GoPro technology includes the HERO 5 or 6 Black Edition, rechargeable battery, SanDisk memory card, standard GoPro case, and a 3-way-pole (GoPro, 2017). HERO 5 and 6 Black Editions are \$399 and \$499 respectively. The rechargeable battery is \$19 and useful for extending the usage time of the recorder. The SanDisk memory card (32GB) is \$29.99, while the standard waterproof GoPro case is \$49.99. Last, the 3-way-pole can be used as mono-pod or self-supporting camera mount for hands-free recording at \$69.99 each. The total cost for all GoPro items listed (using the HERO 5 model) is \$567.97.

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**Using a Student Exchange Program to Foster New Agricultural Experiences for Students**

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## Using a Student Exchange Program to Foster New Agricultural Experiences for Students

### Introduction

Experiential learning has had a long history of being a foundational method of instruction in all components of the complete school-based agricultural education (SBAE) program (Baker, Robinson, & Kolb, 2012; Roberts, 2016). One common method of experiential learning in SBAE is through field-based experiences. High impact, field-based experiences encourage students to create new knowledge, connect concepts across curricula, and explore varying perspectives beyond their own (Murphrey, Odom, & Sledd, 2016). In post-secondary agricultural education, field-based experiences, such as travel abroad programs, have been shown to improve students' content knowledge of region-specific agriculture, increase students' sensitivity to other cultures, and grow students both personally and professionally (Bruening, Lopez, McCormick, & Dominguez, 2002). Providing SBAE students high impact experiences, such as traveling abroad, presents many learning opportunities, but is realistically challenging to implement. This innovative idea provided SBAE programs a cost-effective and sensible solution to meet this need. The *FFA Chapter Exchange* program partners two SBAE programs, which are located in different regions of the United States, to "exchange" students for a short duration.

### How it Works

The Vernon-Verona-Sherrill FFA Chapter, located in New York, has organized a series of student exchanges across the nation. Each "exchange" is unique in design, but typically involves trading three to eight students with another SBAE program for a duration of three to eight days. The time of year the exchange occurs can vary according to the needs of the SBAE programs involved, but previous exchanges have taken place during the school year, during a break in the school year, and over the summer.

During the exchange program, each host chapter provides visiting students learning experiences within their region-specific agriculture and culture. Previous exchange programs have given students the opportunity to experience agricultural operations that are far different from those seen within students' home surroundings. Each host program is responsible for organizing activities that it deems to best represent the region and are responsible for any fees associated with the unique experiences. Host programs are also responsible for organizing sleeping arrangements. Past exchanges have used host families that agree to take-in visiting students for the duration of the experience.

### Implications & Results to Date

To date, six student exchanges have taken place that included the states of Wisconsin, Tennessee, Connecticut, New York, North Carolina, and Florida. Each exchange has been highly successful in providing students unique and rich learning experiences that exposed them to region-specific agricultural operations and cultural diversity. Examples of learning experiences included having students tour or work within strawberry operations, citrus groves, peanut farms, large-scale cattle ranches, maple syrup operations, and urban agriculture. Most exchanges allowed students to be immersed in another SBAE program in which they were able to witness

the diversity of agricultural education programs (e.g. membership characteristics, size, scope, focus). Previous exchange students reported that they created life-long memories and have remained in close contact with their host families. Furthermore, some previous exchange students even reported that this experience was the first time in which they traveled outside of their home state. One student reported seeing the ocean for the first time, while another student reported visiting a farm for the first time. The exchanges allowed all participants to be exposed to people who were different than themselves. Being exposed to new experiences, exploring new areas, and working with new people, prepared students for the adult world.

### **Future Plans & Advice to Others**

The Vernon-Verona-Sherrill FFA Chapter plans on continuing the *FFA Chapter Exchange* program. The chapter is eager to establish new collaborations with SBAE programs from areas around the country that are home to unique agricultural operations. Although each exchange program is designed specifically for the chapters involved, advice is offered that comes with experience in organizing and managing such programs. It is hoped that an exchange network is created that can expand the scope of this program to many chapters. It is suggested that exchanges be approached with caution. Ensure that school administration and parents from both schools fully understand what is occurring and approve the exchange. It may be helpful to offer administrators detailed itineraries, contact information, and permission slips. The use of technology, such as internet video calls, can allow students and parents to meet host families prior to travel. Having students make consistent contact (i.e. a daily phone call) with home during the exchange is also recommended. It is recommended by the researcher that programs require students to complete various reflection activities (e.g. daily journaling) during the experience to align with components of experiential learning (Kolb, 1984). Lastly, the researcher recommends that further research be conducted that examines student outcomes from exchange experiences.

### **Costs & Resources**

The cost of conducting an *FFA Chapter Exchange* can vary tremendously. Travel costs are usually the largest expense, especially if the exchange requires plane travel. The Vernon-Verona-Sherrill FFA Alumni has established a scholarship fund to offset students' travel expenses. As discussed above, the host chapter is responsible for costs associated with experiences they provide to visiting students. It is recommended that chapters take advantage of existing networks they have within their local communities to seek cost-effective activities. Host families are also a great resource to this program. It is recommended to find quality host families and to be very appreciate of their time and effort as they ensure that each student's experience is positive. Lastly, the most important resource is the other SBAE program in which the exchange occurs. Networking and establishing good relations with agriculture teachers throughout the nation can create many opportunities for future student exchanges.

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**Using Instagram Hashtags to Promote Agricultural Communications Students'  
Photography**

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### **Introduction/Need for Idea or Research**

Photography skills (Morgan, 2012; Terry & Bailey-Evans, 1995) and the ability to communicate through online media (Corder & Irlbeck, 2016) are needed competencies of agricultural communications students. Instagram has become an important self-presentation medium that allows users to communicate their experiences through both their choice of subject and different options to manipulate and present their images (Lee, Lee, Moon, & Sung, 2015). Photography is included in the undergraduate agricultural communications curriculum at Texas Tech University. As aspiring communicators, it is important agricultural communications students have an avenue to promote their work. To give students an outlet for posting and promoting their images from the course, the instructor created an assignment requiring students to develop an online portfolio via Instagram utilizing a course-specific hashtag. The assignment required students to develop 10 to 12 posts with images they produced during the course utilizing the hashtag provided by the instructor. The purpose of this idea was to identify the benefits of utilizing Instagram hashtags as an avenue to promote student work and the course itself.

### **How it Works**

Instagram is a mobile photography app with a digital community of more than 600 million users (Instagram, 2017, para. 1). With that many individuals utilizing the digital photography sharing app, the opportunity to share and promote one's images is apparent. In addition to posting images on a profile, users have the ability to add a hashtag within the caption. When hashtags are added to a publicly-posted Instagram image, the post will be visible on the corresponding hashtag page. Any Instagram user can then view the image on the hashtag page. Instagram can provide a valuable tool when engaging and connecting with undergraduates in the teaching and learning process (Salomon, 2013). As a class assignment, students were challenged to promote themselves via an online portfolio on Instagram. Students used their personal Instagram account or they created a new one to post 10 to 12 of their best images from the course. Students were tasked with writing a relevant caption to engage their audience and enhance the storytelling ability of each image. The course hashtag was also required to be posted with each image. The hashtag remained the same for each semester. The students' accounts must be public, or they must allow the instructor to follow them. If the students fail to do one of these two things, the posts will not be visible to the instructor for grading. Each student's collection of posts on Instagram were graded using a rubric that evaluated the quality of the overall composition, clarity (exposure, depth of field, focus), creativity (variety of subjects), artistic expression, and adherence to assignment guidelines of the posts. Students were required to shoot the images posted to Instagram using their DSLR cameras. This required students to download their images from their DSLR camera and export them to Flickr so the images could be accessed on their mobile device for posting.

### **Results to Date/Implications**

The students enrolled in the photography course during the spring and summer semesters in 2016 and 2017 completed the Instagram assignment. To date, the course hashtag has been used on 783 posts. The top nine posts, as indicated by Instagram, range from 29 to 170 likes and up to seven comments per image. Those results are drawn from students who used their personal Instagram account for the assignment. Students who chose to create a new profile received very little engagement. Many of those images received zero likes or comments.

As a result of engagement and sharing of students' Instagram posts, including shares on other social media platforms like Facebook and Twitter, the College of Agricultural Sciences and Natural Resources at Texas Tech University created a slideshow on the college website to showcase the students' work. Additional interest in the students' photography from the course was received from the Lubbock community with the suggestion of displaying their work during the city's monthly art trail. Overall, the implementation of this assignment made the students' work and the agricultural communications photography course visible to a wide range of audiences via Instagram.

#### **Future Plans/Advice to Others**

The use of Instagram provided an outlet for students to promote the work they completed during the agricultural communications photography course. The hashtag gave audiences an avenue to view all images captured by students in not only the current course but also courses prior. This method allowed students to build a digital social portfolio of their work for potential employers to view. The hashtags were also valuable in generating interest in the course among other students in the agricultural communications program at Texas Tech University. The course now reaches capacity each semester.

The course instructor will continue utilizing the assignment in the future. Although the idea creates a valuable avenue for students to promote themselves, some students shied away from using their personal account to post their images. While many different reasons were noted for the apprehension of using personal Instagram accounts for the course, some students suggested they feared their peers would unfollow them or they did not want the instructor to see their personal account. Photography course instructors should spell out the advantages of students using their personal accounts in order to promote their images and develop their personal brand. Established accounts already have followers and provide opportunities for students to receive more engagement on posts. Instructors should also emphasize that students' Instagram profiles must be public for all users to view the posts. If students wish to keep their profile private, the instructor and the student must follow each other on Instagram.

#### **Cost/Resources Needed**

Instagram is a free photo sharing app available to all students who have access to a smartphone, tablet, or computer. The app can also be viewed from a web browser. The instructor and students all need Instagram accounts.

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A Survey to Describe the Benefits and Barriers of University of Arkansas  
Students to Study Abroad

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# **A Survey to Describe the Benefits and Barriers of University of Arkansas Students to Study Abroad**

## **Introduction and Purpose Statement**

International Programs (IPs) have grown in popularity and have increased in importance for colleges of agriculture (Graham, 2012). Furthermore, internationalizing curricula has led to increased global competencies, enhanced worldviews, and internalization of different cultural concepts (Dooley, Dooley, & Carranza, 2008). However, The Open Doors Report published by the Institute of International Education (IIE) with support from the U.S. Department of State's Bureau of Educational and Cultural Affairs stated that only 2.3% of students who studied abroad were enrolled in an agriculture related program during the 2014/2015 year (Institute of International Education, 2017). Barriers exist for study abroad opportunities and are categorized in external or internal barriers to international involvement (Andreasen, 2003). However, students recognize the benefits of international experiences even though barriers to study abroad participation existed (Chang et al., 2013).

When selecting an IP, students engage in assessing the pros and cons of participating before committing (Estes, Hansen, & Edgar, 2016). These decisions, based on advantages and disadvantages of participation, should be examined by universities to provide opportunities and resources that align with students' interests. Understanding students' perceived barriers and benefits will enable efforts focused on increasing the number of participating students (Danjean, Bunch, & Blackburn, 2016). The Dale Bumpers College of Agricultural, Food and Life Sciences (Bumpers College) has worked for five years to increase international education participation to keep up with the University of Arkansas goal of 25% international participation by 2020. Yet, the Bumpers College has maintained about 5% of its student base participating in international experiences.

The conceptual framework of this research was based on college choice theory, which notes three decision-making stages associated with choosing a study abroad program. The stages are: a) the intent to study abroad, b) the search for a program, and c) the selection of and departure for a location (Salisbury, Umbach, Paulsen, & Pascarella, 2008). To tie the theory of college choice theory (conceptually) to the described processes that occur during a study abroad experience (Conner, 2013), social cognitive theory (Bandura, 1986) was utilized to ground the theoretical framework. The following objectives guided this study: 1) describe students' perceived benefits to participating in an IP, and 2) describe students' perceived barriers to participating in an IP.

## **Methodology**

This study used descriptive survey methodology with primarily undergraduate students enrolled in Fall 2017 Bumpers College courses. The survey population consisted of a random stratified sample of courses by academic department (Trochim, 2001). The courses were large-enrollment, required courses by major, and all freshman orientation undergraduate courses in Bumpers College. There were 1,758 surveys collected from students during these classroom visits (Ex. agriculture economics, apparel merchandising, introduction to poultry science, etc.). Students were allowed approximately 10 minutes to complete a paper form instrument and were asked not to complete the survey more than once in the Fall 2017 semester. The survey administration began 23 August 2017, two days after the start of the Fall 2017 semester, and lasted approximately nine weeks with the number of classroom visits varying day-to-day. The

survey was administered to students either before, during, or after a PowerPoint presentation that covered IPs offered by the Bumpers College. Some timing varied depending on the professor's classroom time allotment. Classroom participants ranged from 15 students per classroom to over 250. In general, larger class enrollments had a larger range in college majors than smaller classrooms. Usable data were collected from students using an 11-question, multi-scale survey that was modified from previous research. Data were analyzed using SPSS.

### Findings

Students classifications ( $n = 1758$ ) were 15.8% freshman, 38.4% sophomores, 33.4% juniors, 8.8% seniors, and 3.6% were either nonresponse or graduate students. Some participants reported they had previously participated in a University of Arkansas IP ( $n = 94$ , 5.5%), while others had not ( $n = 1602$ , 94.5%). The majority of students were interested in short-term faculty-led IPs ( $n = 1190$ , 72.1%), followed by international internship ( $n = 760$ , 46%), international exchange ( $n = 490$ , 27.9%), University of Arkansas Rome Center campus ( $n = 365$ , 22.1%), international independent study ( $n = 304$ , 18.4%), and international research ( $n = 285$ , 17.3%). The majority of students wanted to participate in an IP during summer I ( $n = 1138$ , 69%), followed by summer II ( $n = 839$ , 47.7%), and spring semester ( $n = 483$ , 29.3%). Based on a 5-point Likert-type scale (1 = completely disagree to 5 = completely agree), students reported "cost is too high" ( $M = 3.83$ ,  $SD = 1.10$ ), being "too busy with school" ( $M = 3.27$ ,  $SD = 1.18$ ), and "not enough funding" ( $M = 3.09$ ,  $SD = 1.15$ ) as the most influencing barriers from participating in an IP. Using the same Likert-type scale, students reported an IP being a "life-changing opportunity" ( $M = 4.94$ ,  $SD = 0.75$ ), "sets me apart when applying for job" ( $M = 4.27$ ,  $SD = 0.90$ ), and an IP provides "opportunity to live/work abroad" ( $M = 4.25$ ,  $SD = 0.95$ ) as the most influencing benefits. Grand means were determined for benefits and barriers to IP programs. Benefits to IP ( $n = 1730$ ) programs resulted in a grand mean of 4.23 ( $SD = 0.71$ ). For barriers, there were 13 individual statements compressed ( $n = 1735$ ) for a grand mean of 2.60 ( $SD = 0.70$ ).

### Conclusions and Recommendations

The majority of students surveyed were interested in short-term faculty-led programs during summer I. Respondents noted they "agreed" with all nine IP benefit statements, except participating in an IP "to experience the local nightlife (clubs, bars, etc.)" ( $M = 3.85$ ,  $SD = 1.22$ ). Students noted that IPs can have a life-changing impact on them and can help them learn socially and culturally about a host country. However, there was more variability in responses to the 13 IP barriers statements. Respondents noted costs and school commitments as the largest barriers to IP participation. This research supports previous research by Estes and colleagues (2016) noting the pros and cons to studying abroad as reported in benefits and barriers. Understanding students' perceived barriers and benefits will enable universities and colleges to improve efforts focused on increasing the number of participating students (Danjean et al., 2016). Researchers also noted that understanding why students studied abroad should be assessed (Estes et al., 2016). A key concept of learning when viewed through a social cognitive theory lens is students must be able to alter their environment and assign meaning to an experience (Bandura, 1986); however, students cannot begin to do that unless opportunities are afforded to them. Therefore, this study was an important step in understanding students' international experience interests. With shrinking institutional budgets and the desire to serve students in all educational areas, it is important to focus international programming areas on needs and interests. This research will be used to guide the Bumpers College International Programs Office with program development.

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## American Indians: The Under-Underrepresented Population in Agriculture

### Introduction

In Priority Area 3 of the *American Association for Agricultural Education National Research Agenda: 2016-2020* (Stripling & Ricketts, 2016) a call was made to increase diversity within the agricultural workforce. While 61% of the annual job openings in the agriculture industry will be filled with recent agriculture graduates (Goecker, Smith, Fernandez, Ali, & Theller, 2015), this sector of the economy has struggled to attract underrepresented students (Talbert & Larke, 1995). Recently, however, colleges and departments of agriculture have witnessed an increase in minority undergraduates (United States Department of Agriculture, 2014). African, Asian, and Hispanic or Latino American students are most often identified as those groups making up the underrepresented population for which increased enrollment is observed or desired. However, conspicuously missing from these lists are American Indian students.

Attempting to improve the participation of American Indians in the agricultural workforce by increasing enrollment in post-secondary agriculture programs will be challenging, at best. Among Whites, African, Asian, and Hispanic or Latino Americans, the post-secondary student demographics resemble the most recent United States population demographics (Kena et al., 2016; United States Census Bureau, 2017) however, this is not the case for American Indians. American Indians and Alaska Natives constitute approximately 1.7% of the United States population (United States Census Bureau) yet, less than 0.6% of the 17.3 million undergraduates enrolled in post-secondary education were American Indians or Alaska Natives (Kena et al.). Regarding agriculture specifically, of the 27,609 students, in the United States, who graduated with a bachelor's degree in agriculture in 2013, 0.8% were American Indian or Alaska Natives (National Science Board, 2016). However, these statistics may be misleading or even inflated, as the American Indian demographic is consolidated with Alaskan Natives, thus complicating the ability to truly discern accurate enrollment statistics. The incongruity of the proportion of American Indian students studying agriculture, relative to the general student population justify the need to further investigate this demographic. Therefore, the purpose of this study was to explore the factors which contribute to the intentions of American Indian students to pursue agriculture as a college major.

### Theoretical Framework

The theory of planned behavior served as the foundation for this study as it “provides a useful conceptual framework for dealing with the complexities of human social behavior” (Ajzen, 1991, p. 206). Furthermore, this theory provides a “means of understanding students’ decisions to act and can allow the development of programs to meet targeted students’ needs” (Murphey, Lane, Harlin, & Cherry, 2016, p. 14). Ajzen and Fishbein (2005) suggested that an individual’s behavior is a result of the combination of beliefs, attitudes, and intentions. Ajzen (1991) posited intentions precede behavior and presented a model that depicts the influences on intention. Ajzen (2006) explained that individuals act on behavioral decisions based upon *behavioral beliefs* (what one thinks the outcomes of the behavior will be), *normative beliefs* (what other people think about the behavior), and *control beliefs* (what one understands about the factors that facilitate or discourage the behavior).

### Methodology

This was a quantitative case-study. The study participants were all secondary agriculture students (N = 75) at a public high school located on a federally recognized Indian reservation in [STATE]. The researcher developed survey was based upon the work of Frazee, Wingenbach, Rutherford, and Wolfskill (2011). The survey included 5-point Likert-type statements, with answer choices ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*), and related to agriculture as an academic subject, college major, and career, with additional questions focused on academic and social support for pursuing higher education in agriculture. Upon approval to participate, all students completed the online survey over a two-day window during their scheduled agricultural education class. All study participants (100%,  $n = 75$ ) identified themselves as American Indian and included Freshmen (14.7%,  $n = 11$ ), Sophomores (17.3%,  $n = 13$ ), Juniors (21.3%,  $n = 16$ ), and Seniors (46.7%,  $n = 35$ ) with an average age of 16.9 years.

### Findings

Multiple regression analysis was used to determine if a model existed explaining a significant portion in the variability in the students' intentions to major in agriculture as measured by their attitudes toward agriculture as a subject and career along with their academic and social support. The analysis resulted in a statistically significant model ( $p = <.001$ ) that explained 92% of the variance in one's intentions to major in agriculture. As indicated in Table 1, all variables were included in the model explaining a portion of the variability.

Table 1

*Factors Explaining American Indian Students' Intentions to Pursue Agriculture as a College Major*

Variable	$\beta$	Std. Error	$t$	$p$
Agriculture as a Career	.51	.06	7.73	<.001
Academic Support	.34	.04	8.44	<.001
Agriculture as a Subject	.26	.07	3.49	.001
Social Support	-.07	.03	-.08	.03

Note:  $R^2 = .92$

### Conclusions

The findings suggest, at least with this specific study population, beliefs toward agriculture as an academic subject and career as well as the academic and social support American Indian students receive can influence their intentions to pursue agriculture as a college major. However, as this was a case-study, it must be noted, conclusions drawn from the findings cannot be generalized to groups outside of the study population. However, the findings from this study can be used as a foundation from which to guide future research.

### Implications/Recommendations/Impact on the Profession

As the profession seeks to increase the diversity of the students pursuing post-secondary education in agriculture and, ultimately the agriculture industry, attention must be paid to this demographic. Incorporating academic and social support programs along with youth organizations like the FFA and 4-H into the lives of American Indian students may aid in the recognition of the positive benefits of pursuing agriculture as an academic and career option. It is recommended that agricultural education scholars continue to pursue diversity and multicultural research to build the knowledge base surrounding underrepresented populations in an effort recruit and retain these groups into this sector of the economy and society.

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## An Assessment of Leadership Competencies: A Difference of Opinion

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### **Introduction/Need for Research**

Serving as both an administrative leader and Extension educator, County Extension Directors (CEDs) are considered Extension leaders performing many duties and tasks that require leadership skills (Benge & Harder, 2017). The day-to-day leadership roles, as well as organizational shifts and changes, present major challenges for Extension leaders to overcome (Sanders, 2014), and very few Extension leaders have the leadership competence appropriate for today's Extension organization (Ladewig & Rohs, 2000). However, few Extension leadership development programs exist in the literature with demonstrated evaluation methods and impact (Benge & Harder, 2017; Rudd, 2001; Sanders, 2014). The Agricultural Education National Research Agenda emphasizes the importance for agricultural educators to "determine the most effective means for incorporating and assessing soft skills development in both formal and nonformal settings" (2016, p.30). The findings from this study provide insights to both the assessment of leadership skills and influence of leadership ability on the performance of CEDs.

### **Conceptual or Theoretical Framework**

Understanding leadership development as a life-long process wherein skills and abilities can be developed and enhanced over time (Bennis & Nanus, 1985; Goleman, 1998; Katz, 1955), served as the conceptual underpinning of this study. Kouzes and Posner (2002) asserted that leadership is an observable set of skills that can be strengthened if given the motivation and desire. Specific to Extension, leaders must fulfill a number of different roles, and therefore, must possess leadership competency in many skill areas such as emotional intelligence, industry knowledge,

human, conceptual, and communication (Moore & Rudd, 2005). Owen (2004) also identified sub-competencies considered critically important for achieving success in Extension leader roles ranging from oral communication to creativity. Sanders (2014) utilized both qualitative and quantitative methods to identify forty leadership competencies CEDs needed to possess in order to be successful and were grouped in to the following competency areas: (a) communication; (b) coaching; (c) emotional intelligence; (d) organizational knowledge; (e) vision; and (f) environment and culture. Taking into account the findings of Moore and Rudd (2004), Owen (2004) and Sanders (2014), the Leadership Short Course was designed and to build leadership capacity in Florida CEDs. The program offered leadership sessions that explored: (a) role of the leader; (b) leader identity; (c) building strong relationships with others; (d) creating an extraordinary leadership environment (e) best practices in leadership; and (f) continued leadership learning.

### **Methodology**

The purpose of the study was to evaluate leadership skills of [State] CEDs participating in the Leadership Short Course. The objectives of the study were (a) to determine the leadership competency levels of CEDs, and (b) to determine if significant differences existed between CEDs' perceptions and their colleagues perceptions of the CEDs' perceived leadership competencies. The 360 assessment consisted of 21 items, and respondents indicated his/her responses on a Likert-type scale of one to five (1 = *Far below expectations*, 2 = *Somewhat meets expectations*, 3 = *Meets expectations*, 4 = *Exceeds expectations*, and 5 = *Far exceeds expectations*). Each CED completed the assessment of themselves and were asked to distribute the same assessment to 15-20 colleagues who work with them. A total of 211 usable responses were received, whereby 8% (n = 17) were completed by CEDs and 92% (n = 194) were completed by the CEDs' colleagues. SPSS 24.0 was utilized to analyze the data using descriptive and inferential statistics.

### **Results/Findings**

The results of the study found that trustworthiness ( $M = 4.45$ ,  $SD = 0.76$ ) and influence ( $M = 3.66$ ,  $SD = 0.87$ ) were rated the highest and lowest leadership competencies that County Extension Directors possess, respectively. CEDs rated their self-perceived leadership competencies lower than their colleagues did on 20 of the 21 competencies. Significant differences existed between the CEDs' self-perceptions and that of their colleagues on the following 10 leadership competencies: (a) accurate self-assessment; (b) self-confidence; (c) trustworthiness; (d) commitment; (e) initiative; (f) empathy; (g) influence; (h) communication; (i) change catalyst, and; (j) building bonds.

### **Conclusions & Implications**

Florida County Extension Directors are perceived by their colleagues as possessing high amounts of leadership skills and abilities, with trustworthiness being rated the highest. Trustworthiness is an important ability to possess within leadership and Extension as CEDs serve as administrators, Extension educators, and grass roots leaders (Sanders, 2014). In regards to leadership effectiveness, the results of this study reveal CEDs could be lacking self-confidence in their own

leadership abilities when compared to their colleagues' responses. Lower self-confidence may negatively impact their ability to lead and their job performance (Baumeister, Campbell, Krueger, & Vohs, 2003). When addressing measurement of leadership skills and abilities, the differences in perceived leadership ability may indicate the use of self-reporting leads to inaccurate statistical measurement. Schmitt (1994) explained the use of self-reporting measures could lead to inaccuracy and reliability issues when reporting data, and recommended self-reporting instruments be evaluated to ensure instrument reliability.

### Recommendations

Leadership development continues to be a need for Florida CEDs, and further training and professional development opportunities are needed to enhance Extension leaders' leadership competence. A gap exists in the literature related to Extension leader and CED leadership training programs and scholarly reporting. Other Extension systems who are implementing leadership-training programs should share their data and information so each state Extension organization can continue to advance and develop its Extension leaders. Further, the 360 assessment needs to be tested for instrument reliability for both its statements and self-reporting measures. Finally, the 360 assessment should be completed again by both the CEDs and their colleagues to measure CEDs' leadership behavior changes due to the Leadership Short Course.

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# **Animal Welfare Framing on Twitter: How Social Media Messages Bridge the Gap between the Protein Industry and Consumers**

## **Introduction/Need for Research**

The animal agricultural industry is under increasing scrutiny by consumers regarding its ethics related to animal welfare (Mckendree et al., 2014; Croney et al., 2012). Consumers question modern, large-scale practices, citing concerns such as animal well-being, food safety, worker conditions and environmental impacts (Fraser, 2001). While agricultural organizations and businesses try to address negative messages about agriculture, specifically animal production, consumers remain apprehensive (Abrams & Meyers, 2012). Adding to the complexity of the situation, consumers in the millennial generation receive much of their news and information regarding “hot topics,” such as animal welfare, through social media platforms (American Press Institute, 2015), and Mckendree et al. (2014) reported that consumers use the internet most often (yet still relatively rarely) when they seek information about animal welfare. Therefore, social media provides animal protein companies with an effective platform to reach current consumers. Still, little empirical data exist on successful social media strategies for educating consumers about emotion-laden topics like animal welfare.

To address this issue, researchers conducted a content analysis of the Twitter efforts of the top five U.S. protein companies (Watrous, 2013) and their audiences to establish a baseline of the current status of Twitter efforts in the industry. The objectives of this study were to (1) identify common topics and persuasive frames relating to animal welfare within the each companies’ Twitter account originating from the companies and/or from the outside audience and (2) determine if social media messages on the top five-animal protein-producing companies’ Twitter accounts articulated key messages that were also listed on the companies’ web pages.

## **Theoretical Framework**

Message frames are the lens consumers use to view animal welfare related information. Message framing involves the selection and translation of information to define problems, diagnose causes, make moral judgments, and suggest remedies (Entman, 1993), and this approach has become widely used by public relation professionals in branding (Hallanah, 2009). Message framing—often connected to the use of carefully chosen words, phrases, and descriptions—can be used to clarify messages but also is sometimes used in a negative manner to cloud messages by conjuring unpleasant connotations in audiences’ minds (Perloff, 2008). Debate continues about the social responsibility, growth and overall sustainability of the current prevailing model of large-scale animal production (Croney et al., 2012). Transparency is often demanded of animal agricultural systems, and this demand often drives the direction of industry practices. It is important for the protein industry to communicate scientifically grounded messages about the interactions between animals and society (Mckendree et al, 2014).

## **Methods**

In a content analysis approach, (Krippendorff (2013), the five companies’ tweets relating to animal welfare were identified and collected using Sysomos Search (Sysomos, 2017). Sysomos allows users to collect both social and traditional media conversations and creates detailed reports on conversation sentiments, demographics, geography, and key influencers on platforms such as Twitter (Wickstrom & Specht, 2016). The search focused on the most recent six months’ worth of data available (November 2016-May 2017). The search strings (“welfare”



OR “care” OR “handling” OR “rights” OR “animal”) AND (@company name) and (“animal” AND :company name) were utilized. Coders further analyzed the tweet set for animal agriculture-related words, including *animal handling*, *animal welfare* and *animal confinement*. In total, 158 tweets were included in the final data set to be coded. In a thematic analysis, the tweets were categorized based on pre-existing topics identified in the literature (see Abrams & Meyers, 2016) and emerging topics, frames, and tone. Two researchers coded the data set independently, using NVivo 11 data analysis software, using a constant comparative approach (Glaser & Strauss, 1967), reconciling differences post-analysis to improve qualitative reliability.

### **Results**

Only three tweets related to animal welfare topics and originating from the five companies were identified among the Twitter traffic in the six-month period. Those three were retweeted only 28 times. No tweets were found in which the companies directly addressed an audience member. The topics among the companies’ three Twitter post focused on *animal welfare*, *policy*, and *animal feed*, and all three stayed true to the most common persuasive frame, which was being *recognized as an industry leader*. Cargill and Smithfield, the only two companies to produce tweets, were able to communicate key animal welfare frames, such as being an animal welfare *industry leader* and having strong animal welfare *policies*, in both their tweets. The other 155 tweets consisted of audience members tweeting at or mentioning one of the five companies. The audience members also communicated the *industry leader*, *animal care vs. profit* and *zero tolerance for abuse* frames. The tones toward the industry’s production practices (positive, neutral or negative), played a role in defining the audience members’ key messages. Cargill’s and JBS’s audiences produced the most positive tweets, while Tyson Foods’ mentions were predominantly negative.

### **Conclusion**

The rarity of corporate Tweets was a surprising finding, considering the public call for corporate transparency (Croney et al., 2012). Tweets from those outside the corporations tended to focus on *policy*, *animal welfare*, and *abuse*. Being *recognized as an industry leader* was a common frame in posts from outside the companies, which could be viewed as a success for the protein industry, though some of the posts were negative regarding this theme. The three corporate tweets did, in fact, coincide with themes identified in the corporate websites, which showed an attempt to communicate consistent messages across media, but the minimal number of tweets negated the usefulness of this finding. Tweets from outside the companies were varied in terms of topic and frame, but JBS and Cargill’s audience tweets were predominantly neutral or positive.

### **Implications/Recommendations**

The surprising dearth of tweets from the protein companies warrants further investigation. If *not* being proactive with social media communications about animal welfare is a planned strategy, then this strategy, which runs counter to most academic advice (see Mckendree et al. 2014), needs to be examined and evaluated. Further research should include matching these content analysis results with the existing communication strategies of each company, as social media is a recommended medium to help address the communications gap between protein companies and consumers (Mckendree et al, 2014; Mangold & Faulds, 2009). Determining whether or not corporate communication strategies are being accurately executed could lead to a streamlined channel of communication between companies and consumers.

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**What's the Connection? Applying Experiential Learning Principles to Introductory Small Engines Instruction**

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## Applying Experiential Learning Principles to Introductory Small Engines Instruction

### Introduction

Agricultural mechanics instruction has a long-standing history within agricultural education curricula (Wells, Perry, Anderson, Shultz, & Paulsen, 2013). This content area has the potential to engage students in numerous ways through the development and emphasis of technical content knowledge and problem-solving skills (Pate & Miller, 2011). As such, the instruction of small engines could serve a useful role in developing critical thinking skills through a reflective experiential learning process. Experiential learning theory has long played a considerable role in agricultural education (Baker, Robinson, & Kolb, 2012). The notion of learning through active engagement in real-world problems (i.e., learning by doing) has long been used as a foundational point for the hands-on nature of agricultural education (Baker et al., 2012). This is especially true in the realm of agricultural mechanics, where hands-on content delivery in a laboratory environment is typically the method of choice (Phipps, Osborne, Dyer, & Ball, 2008). Extensive literature does not currently exist regarding the use of experiential learning theory's applications in the context of agricultural mechanics instruction, especially regarding small engines content. This research study addresses Research Priority 3, "*What are effective models for STEM integration in school-based agricultural education curriculum?*" (Stripling & Ricketts, 2016).

### Conceptual Framework

Each small engine learning module was developed using Kolb's Experiential Learning Theory as an instructional framework for lesson development, delivery, and student practice. Kolb Experiential Learning Theory includes four stages: (a) concrete experience, (b) reflective observation, (c) abstract conceptualization, and (d) active experimentation (Lamm, Cannon, Roberts, Irani, Snyder, Brendemuhl, & Rodriguez, (2011). The overall purpose of this instructional design was the development of independent student practice for rebuilding and diagnostic analysis of small engine operation by utilizing Kolb's Experiential Learning Theory (1984). The purpose of using Kolb's Experiential Learning Theory was to provide a degree of metacognition for students to synthesize their experience and then apply their new skills to future lessons.

### Methods

Power Equipment Technology is a required course at Auburn University for all pre-service Agriscience Education students and is taught by a Professor of Agriscience Education at Auburn. A single small engine lesson was chosen for this investigation and emphasized the compression phase of the four-stroke engine, associated systems, and components necessary for compression to occur. Utilizing *concrete experience* students were asked to visualize the individual components and then tear down the systems required for compression (length of stroke, cylinder diameter, fuel/air, piston placement, head, crankshaft, flywheel) working cooperatively with the course instructor. This assured student understanding of proper systems operation and tear down procedures. After completing the tear down of the compression system, students were required to perform *reflective observation* on the procedures and components by

diagramming the compression system in sequential order of occurrence and cooperatively evaluate and discuss other students diagram and explanation of the compression stroke through the use of abstract *conceptualization*. Students ideas, explanation, corrections, and new skills were discussed in cooperative learning groups and then to the class. Students were then able to modify their process of teardown and understanding of the compression system based on peer feedback and discussion. Students were tasked with *active experimentation* to rebuild the compression system using modified conclusions from the group and class discussion.

### **Results**

Course modules were conducted during 16 weeks of synchronous instruction in the agriculture mechanics lab. Power Equipment Technology consisted of 105 guided and independent activities, organized in 28 learning modules during the 2017 spring semester. Student aptitude in mechanical applications at Auburn University was assessed in early January, prior to the start of the Spring 2017 Power Equipment Technology course. Students ( $N=33$ ) indicated a low understanding ( $M=1.8$ ,  $SD=2.45$ ) or very low understanding ( $M=1.1$ ,  $SD=3.67$ ) of mechanical processes related to small engine operation and repair. Post evaluation of student performance ( $N=33$ ) indicated a statistically significant increase in understanding and proficiency ( $M=4.1$ ,  $SD=1.98$ ) after the treatment related to compression system rebuilding.

### **Conclusions**

This study demonstrated the need for novel approaches for the instruction of small engine theory and critical thinking. Students demonstrated greater understanding and application of complex processes when Kolb's Experiential Model was implemented. The researchers are currently in the evaluation phase of the Power Equipment Technology course utilizing Kolb's Experiential Learning Theory as framework for small engine instruction. This style of instructional design demonstrated the need for reflective and experiential approach to complicated mechanical systems in both abstract and concrete learning. Student performance supports this conclusion.

### **Implications**

The use of innovative instructional processes for small engine and mechanical instruction is vital to pre-service teachers understanding and confidence in the agriculture mechanics classroom. Investigations designed for quantitative analysis between traditional small engine instruction and enhanced teaching utilizing Kolb's Theory of Experiential Learning should be investigated further. Review of this enhanced teaching style yielded several considerations for future mechanical courses: incorporation of Kolb's Experiential Learning Theory for all pre-service agriscience educators, continued development of teaching and learning theories in the Power Equipment Technology, and interdisciplinary STEM investigation with elementary teacher educators.

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Assessing and Evaluating an Honors Program in a College of Agriculture

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# **Assessing and Evaluating an Honors Program in a College of Agriculture**

## **Introduction**

Honors programs in higher education are thought to promote active learning, engage students in undergraduate research, and provide capstone experiences (Siegfried, 2001). Assessment and evaluation of honors programs creates an opportunity to address the mission of the program, highlight program strengths and weaknesses, gather information, and gain program support (Otero & Spurrier, 2005). The need for program and course assessment is supported by accrediting bodies; however, honors colleges have remained hesitant to self-assess, citing the qualitative nature of honors programs as a difficulty in measuring program success (Driscoll, 2011; Shushok, 2006). The current lack of self-assessment among honors programs is concerning for educators, honors directors looking to improve their programs, and students, who are arguably the largest stakeholder group. Lack of assessment could place honors programs at risk when resources are tight (Shushok, 2005). The University of Arkansas established a campus wide Honors Program, and the Bumpers College began participating in 2003.

Priority three of the AAAE National Research Agenda specifies that interest in higher education in agriculture is on the rise, which is vital to provide the industry with skilled young professionals to address complex, interdisciplinary agricultural issues (Roberts, Harder, & Brashears, 2016). Colleges of agriculture, particularly those with the unique addition of an honors program, need to make an effort to understand the needs of current agricultural honors students. The purpose of this quantitative study was to determine students' perceptions of the Bumpers College Honors Program. The following research objectives guided the study: determine honors students' perceptions of the program as well as honors students' perceived areas of improvement and perceived areas of success.

## **Conceptual Framework**

Honors programs typically exist in two forms in higher education. Firstly, under a university wide honors program, or secondly, a departmental program (Cosgrove, 2004). Students are recruited and selected to participate in a more personalized, rigorous educational experience, often with the addition of undergraduate research or study abroad opportunities. At the core, honors programs are designed to "add quality to the academic mission of their host institutions by promoting the highest intellectual standards" (Bottoms & Gutgold, 2016, p. 4).

Touted benefits of honors programs include a positive impact on student retention, elevated academic coursework, and raising intellectual levels across campus, graduation rates, and more (Cosgrove, 2004). While these claimed benefits are dispersed throughout the literature, the greater impacts of honors programs still remain largely unstudied in higher education from a multi-site empirical standpoint (Cosgrove, 2004). As such, any evidence based on single-site studies may only provide educators with a narrow view of the true impact honors programs have on college students' experiences. Although the researchers agree that multi-site and longitudinal studies provide a broader view, the program started with a single-site inquiry to be expanded over time. For educators looking to actively maintain, grow, and improve their programs, various forms of support are suggested to provide students with a successful honors experience, particularly through providing faculty and peer mentoring options, discipline specific thesis guides, and thesis oriented coursework (Gutgold & Rogers, 2016). Students that enter honors programs are held to high standards. The literature emphasizes program structure and



organization is recommended to combat student procrastination, minimize risk, and increase accessibility (Siegfried, 2001).

### **Methods**

This quantitative research used an electronic survey to collect information from students enrolled in the Bumpers College Honors Program. The instrument was assessed for face and content validity by the Bumpers College honors faculty committee. The instrument was analyzed to determine reliability (Cronbach  $\alpha = .95$ ). Census sampling was utilized in order to gather feedback from all students enrolled in the honors program. Instruments were provided in electronic form and distributed using current honors student emails. A 66% response rate was achieved, with 99 respondents. The instrument consisted of 20 questions that assessed students' perceptions of the program. Data was exported from the electronic system and analyzed with SPSS© version 23. Data analyses consisted of descriptive statistics, including the computing of frequencies, means, standard deviations, and percentages. Open-ended responses were categorized and counted to determine frequency.

### **Results**

Participants were comprised of an approximately even number of freshmen, sophomores, juniors, and seniors, from a population of 149 students. The instrument was designed to gauge students' overall perceptions of the honors program, ranging from the local agricultural honors program, to the overarching larger honors program offered at the university. Students reported slightly lower satisfaction with the honors courses available in the college and even lower satisfaction with the honors courses available at the departmental level. Students were highly satisfied with the depth of interactions with faculty, research funding opportunities through the honors college, and with funding opportunities for study abroad. Students also noted a positive perception of the research opportunities available, assistance from mentors, and assistance from the college with administrative forms. Students reported their faculty mentors to be extremely helpful in selecting a topic, assisting with research proposal development, and conducting research. However, lower response rates were noted for questions pertaining to the writing and revision of a thesis. A small portion of students had not been met with, or enrolled in any orientation courses to cover the requirements for graduating with honors through the agricultural college.

### **Conclusions and Recommendations**

The objectives of the study were to determine student perceptions of the program and identify areas of success and those needing improvement. Although students noted lower dissatisfaction with the courses available at the departmental and college level, students did report satisfaction with the teaching faculty, research mentors, and their general experience in the Bumpers College Honors Program. Students largely indicated an awareness of opportunities for mentoring, funding, and study abroad within the college. The main areas of improvement included addressing students that had not met with faculty or staff to learn about program requirements as well as increasing the courses available in the college and among departments. Student perceptions reflected the findings of previous studies, showing that organized program structure, mentoring experiences, and clear thesis outlines are beneficial to undergraduate honors students (Gutgold & Rogers, 2016). The researchers recommend longitudinal assessment and evaluation of the efficiency of the Bumpers College Honors Program to encourage continual improvement.

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**Assessing the Critical Thinking Styles of International Faculty**

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## **Introduction**

In addition to subject matter skills, today's college students need reasoning, problem-solving and thinking skills. Therefore, faculty need to understand the importance of those skills for students and themselves. As U.S. faculty engage in working with counterparts in foreign institutions to enhance curricula, teaching, and student learning, knowing more about faculty critical thinking styles should lead to more relevant professional development in international university settings. Critical thinking is a concept that addresses reasonable and reflective thinking that is purposeful and goal directed (Lamm & Irani, 2011). Students must be directed toward higher levels of cognition, and instructors must address this issue in today's learning. University agricultural teacher educators should take the lead in these efforts, considering the diverse subjects and audiences within agriculture (Whittington, 1995).

## **Conceptual Framework**

Researchers at the University of Florida developed the Critical Thinking Inventory (UFCTI) to help educators identify their Critical Thinking (CT) style and to utilize that understanding in their teaching (Lamm & Irani, 2011). Other researchers have utilized similar instruments, primarily in describing student critical thinking abilities and relationships with other teaching and learning strategies and attributes (Rollins, 1990; Cano & Martinez, 1991; Burton & Garton, 2007; Lamm, Rhoades, Irani, Roberts, Unruh Snyder, & Brendemuhl, 2012; Burbach, Matkin, Quinn, & Searle, 2012). Burbach, et al. (2012) concluded that teachers can influence their students' critical thinking. Further, they posited agricultural education instructors, including college instructors, need to provide opportunities for students to practice their critical thinking skills. Similar discussion by Lamm, et al. (2011) included a variety of concepts regarding how critical thinking is related to other important learning strategies. They concluded that educators need to be aware of critical thinking characteristics and attend to those students who may be lacking those skills. However, most university instructors, in the U.S. and abroad, are well-trained in a specific discipline and not proficient in a broad understanding of learning, including critical thinking. Faculty must first become aware of the concept of critical thinking so they, in turn, can utilize new knowledge in improving their teaching and, therefore, student learning.

## **Methodology**

This study was conducted at King Saud University (KSU) in Riyadh, the Kingdom of Saudi Arabia. University faculty participated in five days of workshops focused on curriculum and teaching and learning. Men and women faculty attended separate but similar workshops. The purpose of the study was to ascertain the critical thinking preferences of university faculty in a foreign institution. Specifically, the project was designed to 1.) determine the critical thinking styles of the faculty and 2.) to compare the men and women faculty on the measure, utilizing the UFCTI to ascertain the critical thinking styles of the faculty. The 20-item instrument was administered in person using a paper form; no instruction related to critical thinking occurred in the workshops prior to the inventory administration. The CTI is a validated measure of CT style (Lamm & Irani, 2011). Results were analyzed for the separate groups, male and female, which is common in the Kingdom. The instrument allows participants to be described as those Seeking Information and those of Engagement (UFCTI, n.d.). The inventory measures critical thinking

style rather than skill on a continuum from seeking to engaging. According to the developers, people who score higher on the Seeking Information side of the scale are aware of their own predispositions and biases and recognize their current opinions and positions have been influenced by their environment and experiences. They are “hungry learners,” open to the opinions of others and take care to seek out divergent points of view. Seekers have a desire to know the truth, even if the truth conflicts with presently held beliefs and opinions. People who score higher on the Engagement side of the continuum are aware of their surroundings and able to anticipate situations where good reasoning will be needed. They look for opportunities to use their reasoning skills and are confident in their ability to reason, solve problems, and make decisions. They are also confident communicators and able to explain the reasoning process used to arrive at a decision or problem solution.

### **Findings**

In describing the UFCTI, Lamm and Irani (2011) indicate that higher UFCTI scores (78.5 and higher) indicate a “seeking information” style and lower scores (78.4 and lower) indicate an “engagement” style. Several differences between female and male KSU faculty were identified. More female faculty indicated on average a slight tendency toward the seeking style. Individually, 14 of the 22 females indicated a seeking style and 8 indicated an engaging style of critical thinking. UFCTI scores for female faculty ranged from 73.8 to 89.7 with a mean score of 79.9. More male faculty indicated a slight tendency toward the engaging style, with 21 of the 39 males indicating the engaging style and the remaining 18 indicating the seeking critical thinking style. UFCTI scores for the male faculty ranged from 66.4 to 90.9 with a mean score of 78.3.

### **Conclusions**

Overall, the two groups of faculty in the study were similar. The overall means for both groups were very close to the dividing point on the scale between seekers and engagers. Within each group, there was more variability in scores among the male faculty than the female faculty.

### **Recommendations**

Unfortunately, there are no studies available that would allow for a comparison between U.S. faculty and faculty outside the U.S. One avenue of inquiry could address U.S. faculty critical thinking styles and examine any differences between the two groups. As Perry, Retallick and Paulsen (2014) suggested in their study, faculty need expertise in critical thinking and how that relates to their students’ style and the teaching strategies they employ. Future faculty workshops in the Kingdom should focus on how faculty Critical Thinking styles can be used to inform their teaching. Administering the CTI to their students would also provide insight into student learning needs. As Lamm, et al. (2011) implied, agricultural educators should be at the forefront in assisting other faculty in utilizing what is known about critical thinking, teaching and learning.

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## Comparison of Supervisor and Extension Personnel Perceptions of Communication Needs

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## Comparison of Supervisor and Extension Personnel Perceptions of Communication Needs

### Introduction

In order to remain relevant in the 21<sup>st</sup> century, Cooperative Extension must expand and redirect its resources (Bull, 2004). Cooperative Extension is a well-kept secret, and “many who could find value in Extension’s programs know little or nothing about the organization (West, 2009). County Extension agents and supervisors rank communication and public relations skills high amongst competencies needed for job success (Cooper, 2001). Technology is changing rapidly, and it is important for Extension outreach to clientele to reflect these changes (Harder, 2010). Supervisors play a key role in employee performance, and “it is the role of supervisors to operationalize corporate culture” (Vlosky, 2009). There is a need for parity between supervisors’ and employees’ perceptions of communications to ensure successful adoption of communications activities.

### Theoretical Framework

The stages of the innovation process within an organization (Rogers, 2003) are (1) agenda-setting, (2) matching, (3) redefining/restructuring, (4) clarifying, and (5) routinizing. In agenda-setting, a perceived need for innovation arises from problems within the organization. In matching, an innovation is matched to a problem an organization is encountering in meeting its agenda. In redefining/restructuring, the organizational structure is modified, and the innovation is adapted. In clarifying, the organization-innovation relationship becomes more defined. In routinizing, the innovation loses its identity as it is incorporated into the activities of the organization. Cooperative Extension has identified many communications needs within Cooperative Extension (Alston, 2011; Cater, 2013; O’Neill, 2011). In this study, both Extension supervisors and personnel ranked the level of importance of communication mediums in meeting the agenda of Cooperative Extension.

### Methods

A survey was conducted of Extension personnel, including their supervisors. The questionnaire was developed for this project with input from Mississippi State University’s Office of Agricultural Communications. The employee group consisted of county agents, area agents, associates, regional specialists, and state specialists/faculty. Of these, 356 were sent the questionnaire and 129 responded (36.2%). The second group consisted of the primary group’s supervisors: statewide administrators, R&E center heads, regional extension coordinators, and department chairs. Of these, 25 were sent the questionnaire and 15 responded (60%).

### Results

Extension personnel ranked social media and visual communication higher than supervisors did. On a scale of 1= *Not Important* to 5 = *Extremely Important*, supervisors responded with  $M = 2.64$  for managing a Twitter account, compared to personnel who responded with  $M = 3.98$ . Creating Instagram posts received  $M = 2.55$  from supervisors and  $M = 3.71$  from personnel. Creating Facebook posts received  $M = 2.91$  from supervisors and  $M = 4.24$  from personnel. Visual communication included graphic design and editing videos. For example, supervisors responded with  $M=2.55$  for graphic design for newsletters, while personnel responded with  $M=3.98$ . Supervisors’ response to editing video was  $M=2.55$  and  $M= 3.50$  from personnel.

Importance of written communications appears similar between personnel and supervisors, while news communication varies based on the medium. Importance of writing an educational newsletter received  $M = 4.09$  from supervisors and  $M = 4.36$  from personnel. Writing a business letter received  $M = 3.82$  from supervisors and  $M = 4.32$  from personnel.



News communication included being interviewed for radio and TV, writing a news story, and working with local media to get coverage of Extension events/stories. Being interviewed for radio and TV were very similar between supervisors and personnel. Being interviewed for radio received  $M = 3.91$  from supervisors and  $M = 4.01$  from personnel. Being interviewed for TV received  $M = 3.73$  from supervisors and  $M = 4.16$  from personnel. However, writing a news story received  $M = 3.36$  from supervisors and  $M = 4.22$  from personnel.

The only two communication mediums Extension supervisors ranked as more important than personnel were marketing and making a speech or presentation. Marketing received a level of importance of  $M = 4.73$  from supervisors and  $M = 4.66$  from personnel. Making a speech received  $M = 4.73$  from supervisors and  $M = 4.67$  from personnel.

### **Conclusion & Recommendations**

Cooperative Extension must be creative in its marketing strategy to remain relevant in the 21<sup>st</sup> century (Burrows, 2008). Communication mediums, such as news outreach and social media, that Extension personnel and supervisors report low use or importance of can have large impacts in Extension marketing. For example, writing a newspaper column can influence reader awareness of an issue by over 40% (Ehret, 2008), and Facebook posts of 45 Extension respondents can collectively reach 6,000 followers (O'Neill, 2011).

Because communication and social media use is influenced by organizational factors (Walden, 2016) and Extension professionals seek professional development, "in the latest developments in digital technology" (Alston, 2011), professional development in communication strategies for Extension personnel is strongly recommended. Such professional development should allow personnel to try new skills and receive feedback (Garst, 2014) and take a step-by-step approach to save Extension personnel time in overcoming the high learning curve (O'Neill, 2011). With low reporting rates of social media use by Extension personnel to supervisors (O'Neill, 2011) and the importance of reports in analyzing an organization's use of resources and growth (Malmelin, 2007), a recommended component of professional development is documentation of communication. This could assist supervisors in more accurately knowing personnel's communication strategies and facilitate conversations on the mediums both personnel and supervisors consider most important.

Additionally, professional development should share analytics with personnel and supervisors on the benefits and potential reach of different communication mediums. It is possible that personnel's and supervisors' estimate of importance is low because of low use of that communication medium. Therefore, Extension personnel and supervisors would not have an opportunity to realize how large the potential impact a communication medium can have for a target audience. Professional development should assist Extension personnel and supervisors in identifying local news media agents (Caldwell, 2005) who can provide partnership in advancing the communication strategies of Cooperative Extension and complement Extension personnel skill sets. Finally, changes in technology affect professional development delivery (Harder, 2010). Technology can be valuable in making professional development cost- and time-efficient, but the skills and preference of professional development participants must be considered. While Extension personnel support use of webinars in training, they are unlikely to use Twitter or professional development blogs (Cater, 2013), which should shape delivery choices.

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# **Corporate Positions on Animal Welfare: A Content Analysis of Protein Companies' Web Pages**

## **Introduction/Need for Research**

Most consumers shape opinions and concerns about animal welfare with little or no direct knowledge of, or experience with, animal production practices (Abrams & Meyers, 2012). As technologies have advanced in both animal production practices and in public communications, information on how livestock are raised and processed into protein foods has become available to consumers on a multitude of media platforms. One common way for animal protein companies to reach their consumers directly is through providing information on their corporate websites. While the volume of online content and the reach of web-based activities continue to grow rapidly, the web, for most corporate actions, remains a mainstay tool for communicating with consumers (Symonenko, 2007). With this fact in mind, it is important for communications professionals and decision-making executives to use web content to address and respond to social issues, such as a public concern for animal welfare, in the most truthful and transparent manner possible (Lobao & Meyer, 2001). Therefore, examining the current content on protein companies' websites provides a baseline for understanding the current state of corporate communications about animal welfare so improvements in public communications can be made.

The purpose of this study was to identify and describe the nature of corporate positions on animal welfare available on the websites of the top five meat-producing companies in the U.S by (1) identifying common topics in each company's animal welfare content, (2) identifying the persuasive frames used by each company, and (3) identifying key terminology related to production and processing practices used in the corporate positions.

## **Theoretical Framework**

As the protein industry faces increased pressure to maintain a transparent production system, public perceptions of animal agriculture practices have often driven the direction of the industry (Coombs, 1998). Unfortunately for protein companies, consumers report not having a primary source of animal welfare information (McKendree, Croney, & Windmar, 2014). Still, for most businesses, including those in the protein industry, persuasion strategies are of utmost importance in forming and proliferating socially acceptable standards and, eventually, changing or maintaining business practices (Coombs, 1998). One persuasion technique in corporate communication efforts such as website content is framing. Framing involves selecting aspects of a situation and making them more prominent to audiences through narrative that serves four functions: define problems, diagnose causes, make moral judgments, and/or suggest remedies (Entman, 1993). Message frames determine what content is relevant to an audience to define the roles of those involved; to outline relevant beliefs, actions, and values; to determine the language used to discuss the topic; and to outline the values and goals of the content area (Perloff, 2008; Hertog & McLeod, 2001). Characteristics affecting framing include the subject, the angle, the balance, and the tone of the news story.

## **Methodology**

In the context of this study, content analysis methods allowed researchers to describe and dissect website contents to disclose the topics, frames and terminology used to make up animal welfare key messages. The method involves a systematic reading of a body of text, images, and symbolic matter (Krippendorff, 2012). The companies chosen as subjects of this research were

the top five animal protein producing companies in the U.S. in terms of annual sales by multiple surveys and reports (Watrous, 2013). All the companies maintained a dedicated a page or pages on their websites devoted to providing information on corporate animal welfare positions and practices. These web pages were the appropriate unit of measurement, as they represented each company's corporate-wide position on animal welfare. Following a combined deductive and inductive approach to identify thematic topics, frames, and terminology, researchers began the analysis with a partially constructed codebook containing codes initially developed based upon animal production-related frames identified by Abrams and Meyers (2012).

## **Results**

Each company dedicated a portion of its main animal welfare content to explaining to consumers the company's core values and goals concerning animal care. Seven thematic topics were identified in the main animal welfare content of the five companies' sites. Each of the companies took a general approach to the topics, most commonly citing *policy* and a *commitment to animal welfare*. Each company used a particular set of frames to mold individual animal welfare messages for consumers. It appears to have been important that the companies lead consumers to the conclusion that their company was an *industry leader in animal welfare* and that the company valued *animal care vs. profit*, as these were easily the most cited frames across the companies' website content. Finally, the key terminologies identified were animal production practice related. Eighteen common, emergent terms were identified. Of those, *animal handling* and *humane* were the most cited terms, supporting the idea that companies place an emphasis on the ethical portrayal of their animal practices. The companies were diverse and not unified in the terminology they used to refer to emotion-laden concepts, such as *slaughter* and *harvest*.

## **Conclusion**

As consumers report not having a reliable source of information regarding animal welfare practices (McKendree et al., 2014), a more united message across the animal protein industry would provide consumers with consistent sources of information. When communicating an animal welfare idea to consumers, using company policies, frames, terminology, and topics as portrayed on the website will create a more fluid and consistent message less likely to be lost in translation. There appears to be room for improvement in terms of developing unified messages, framing, and terminology across the industry in communications about animal welfare.

## **Implications/Recommendations**

Communications professionals at each company should use the results of this analysis as an evaluative tool to determine if the web content related to animal welfare actually communicates the companies' animal welfare messages as they were intended to be communicated. Repetition of key frames, focus on key topics, and use of advantageous terminology are all important strategies that can benefit from the results of this content analysis in agricultural media (Provencher, 2016). The comparative nature of this study may guide industry communicators on how to be more consistent in industry-wide messaging about animal welfare. Further research should include matching these content analysis results with the existing communication strategies of each company. More content analysis studies should be conducted on animal protein companies' other media outlets, such as social media. Also, further studies should be conducted to compare the presence of frames, topics and terminology in news coverage to determine the effectiveness of web based communication on media relations.

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**Effects of Activity Type and Gender on Cognitive Achievement in Hydraulics**

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## Introduction

Agricultural mechanics is an important component of a majority of high school agricultural education programs (McCubbins, Anderson, Paulsen, & Wells, 2016). National professional standards (American Association for Agricultural Education, 2017) call for teachers to be “aware of cutting edge technology” and to “teach students how to use technology appropriate to the agricultural industry” (p. 2). Yet, researchers (McCubbins et al., 2017) have found that many school-based agricultural education programs lack the necessary tools, equipment, and financial resources to teach the current curriculum, much less a more modernized curriculum. Thus, teachers are caught in a dilemma; urged to modernize, but lacking the necessary resources to do so (Johnson & Wardlow, 2017).

Educational simulations are “an artificial representation of a real world process to achieve educational goals through experiential learning” (Al-Elq, 2010, p. 35). Constructivist learning theory, which posits that students construct knowledge when they “attach meaning to an experience or activity” (Rutherford-Hemming, 2012, p. 133), supports the efficacy of educational simulations. This study sought to determine if there was a significant ( $p < .05$ ) difference in cognitive achievement between students taught basic hydraulics using an inexpensive educational simulation activity as compared to a trainer-based activity (\$10,000 per trainer; Iron Horse, 2016). A secondary purpose was to determine if there was a significant ( $p < .05$ ) difference by gender or a Gender X Treatment interaction. This research replicates and extends research by Agnew and Shinn (1990) and supports development of a sufficient scientific and professional workforce (Stripling & Ricketts, 2017) for the agricultural industry.

## Methodology

The accessible sample for this study consisted of students ( $n = 47$ ) enrolled in two laboratory sections of a freshman-level university agricultural systems course taught in fall 2017. Prior to lab, we randomly assigned all enrolled students to the control or experimental groups; due to absences, 20 and 24 students participated in the control and experimental groups, respectively. The control group planned and constructed two hydraulic circuits using the hydraulic trainers by connecting components with hydraulic hoses; the experimental group planned and constructed the same two circuits by connecting printed hydraulic symbols using wires with clip-connectors. The control group manipulated the trainers and observed the operation of the system. The experimental group “operated” each circuit by manipulating the specially designed directional control valve symbol and tracing the path of oil flow through each circuit. Three or four students worked cooperatively with each trainer or set of symbol cards. As part of each lab activity, students in the control and experimental groups answered the same set of questions about the operation of each circuit. Immediately following the lab activity, each student completed a five-item multiple-choice quiz (*coefficient alpha* = .62) based on the content of the lab. The quiz was consistent in format and length with the lab quizzes normally administered after lab activities.

## Results

The results of a 2 X 2 factorial ANOVA indicated no significant ( $p < .05$ ) differences in quiz scores by the main effect of activity type (trainer or simulation) or the interaction of activity type and gender. The results did indicate a significant ( $p = .03$ ) difference in quiz scores by the main effect of gender, with males scoring higher than females (Table 1). The  $\eta^2$  of 0.12 indicated

gender explained 12% of the variance in quiz scores, while the Cohen's  $f$  of 0.36 indicated a medium effect (Cohen, 1988) for gender on quiz scores.

Table 1. Means, Standard Deviations, and 2 X 2 Factorial ANOVA Results for Effects of Activity, Gender and Activity X Gender on Cognitive Achievement in Hydraulics

Treatment	<i>n</i>	<i>M</i>	<i>SD</i>	ANOVA	
				<i>F</i> (1, 40)	<i>p</i>
Lab Activity				0.21	.65
Control (Trainers)	20	3.75	1.37		
Experimental (Simulation)	24	4.00	1.22		
Gender				5.43	.03
Female	22	3.45	1.22		
Male	22	4.32	1.21		
Treatment X Gender				0.27	.61
Control-Female	11	3.27	1.27		
Control-Male	9	4.33	1.32		
Experimental-Female	11	3.64	1.21		
Experimental-Male	13	4.31	1.18		

### Conclusions

The results of this study indicated use of hydraulic trainers and simulations using hydraulic symbol cards were equally effective in teaching basic hydraulics when cognitive achievement was the instructional objective. These results agree with those of Agnew and Shinn (1990) and support the efficacy of an inexpensive simulation method of incorporating hydraulics into the curriculum. Further, the simulation method was equally effective with all students regardless of gender. The finding that males significantly out-performed females on the hydraulics quiz contradicts results reported by Johnson, Wardlow, and Franklin (1998) who reported females outperformed males in tests of applied mechanics and electricity.

### Implications/Recommendations/Impact on the Profession

To the extent students enrolled in this freshman-level university agricultural systems course were similar to students in advanced high school agricultural mechanics courses; these results have important implications for high school agricultural education programs. The results indicated teachers can effectively use simulations with inexpensive hydraulic symbol cards to teach basic hydraulic system components, functions, principles, and circuits and be confident students will learn as well with these simulations as they would using expensive hydraulic trainers. This is an important finding because high school teachers have reported the lack of equipment as a major factor preventing them from incorporating hydraulics into the curriculum (Johnson & Wardlow, 2017).

The finding that females scored lower than males on the posttest raises some concern, given that 67% of all agricultural teacher education candidates in 2016 were female (Smith, Lawver, & Foster, 2016). However, because gender explained only 12% of the variance in quiz scores, additional research is needed before concluding this is a significant problem for the profession.



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**Global Learning Reflection: Evaluating the International Blog Posts of the Virginia  
Agriculture Leaders Obtaining Results (VALOR) Program**

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## **Global Learning Reflection: Evaluating the International Blog Posts of the Virginia Agriculture Leaders Obtaining Results (VALOR) Program**

### **Introduction**

Global leaders in agriculture require skills and knowledge in international economic development, globalization, culture in agriculture, and worldwide agricultural networks to address diverse, interconnected, and complex global issues (Bruening & Shao, 2005; Kaufman, Rateau, Carter, & Strickland, 2012). Integrating international experiences in agricultural programs provides capacity for participants to serve as global leaders (Jones & Bjelland, 2004). The Virginia Agriculture Leaders Obtaining Results (VALOR) program incorporates an international seminar to provide these experiences to fellows. VALOR also includes blogging as a reflective process for fellows to share observations and insights based on seminar experiences.

For agricultural leadership programs situated within Cooperative Extension, it is essential to conduct rigorous evaluations to demonstrate program value for continued funding (e.g. Lamm, Carter, & Lamm, 2016). Bush, Corkins, Seibel, and Elliott-Engel (2017) conducted an evaluation of the VALOR program, which utilized a stratified sample to examine reflections on competency and capacity development through required post-seminar blogging. Within this study, qualitatively coded passages from blog posts pertaining to the international seminar detailed experiences, but lacked meaningful reflection. In alignment with priority five of the American Association for Agricultural Education National Research Agenda, *Efficient and Effective Agricultural Education Programs* (Thoron, Myers, & Barrick, 2016), this study utilized an all-inclusive approach to explore VALOR fellows' reflections during blog entries on their experiences during the international component of the program.

### **Conceptual Framework**

For international experiences, experiential learning is a common pedagogy for actively engaging participants (Montrose, 2015). Adult learners prefer experiential learning opportunities, which incorporate reflective processes to enhance learning (Lamm et al., 2011). Reflective activities improve conceptual reasoning, critical thinking, and writing and speaking abilities (Dallimore, Hertenstein, & Platt, 2008; Hamann, Pollock, & Wilson, 2012). Group and individual reflection such as journaling or blogging, are activities often employed within leadership programs to challenge participants to synthesize experiences (Allen & Hartman, 2008). When engaged in reflective learning, adults are able to expand their capacity through the integration of novel experiences (Densten & Gray, 2001).

### **Methodology**

The researchers designed a study to explore what VALOR fellows conceptually reflect on during the international component of the program on the VALOR designated blog site, managed by fellows and staff. The researchers collected all blogs which discussed the international component of VALOR for analysis. The sample included 34 total blog entries ( $N=34$ ) from 17 fellows ( $N=17$ ) from cohort one and two of the VALOR program. The research team used an iterative process to examine the blog posts, beginning with a superficial examination of extract passages, which discussed competency and/or capacity development (Corbin & Strauss, 2008). The researchers then coded each extracted passage utilizing pre-set codes, which were the result of an iterative, open-coding process in a previous study on blog reflections within the VALOR program (Bush et al., 2017). The pre-set codes included expanded thinking with change and self-

awareness as subthemes; competencies; and interconnectedness with networking and affiliations as subthemes. The researchers quantified and transformed responses into nominal values (Chi, 1997).

### **Results**

Overall, the sample included 64.7% ( $n=11$ ) of fellows ( $N=17$ ) and 38.2% ( $n=13$ ) of blog posts ( $N=34$ ) for coding. The remaining blog posts detailed the experience rather than providing a reflection upon the experience. Fifty-eight percent of fellows ( $n=10$ ) and 35% of blog posts ( $n=12$ ) included passages pertaining to expanded thinking. From these blog posts, five fellows discussed aspects of change with three fellows demonstrating increased self-awareness. Two fellows (12%) discussed interconnectedness within their blog posts. One of the posts discussed networking, while both incorporated affiliations. None of the fellows mentioned competency development within their blog posts.

### **Conclusions and Recommendations**

International blog posts from the VALOR program lacked substantial reflection. The international blogs focused predominantly on physical components of the scheduled activities. Details provided an overview of the seminar experience, but showed little-to-no evidence of personal growth through expanded thinking, interconnectedness, and/or competency development. VALOR aims to improve leadership and communication skills, increase awareness of diversity and relationships, and improve self-awareness within agriculture industries and stakeholders. The blog posts provided little to no evidence of this development or capacity for global leadership.

Although blogging is recognized as a platform for reflection (Chu, Chan, & Tiwari, 2012), Douthit, Schaake, Hay McCammant, Grieger, & Bormann (2015) proposed blogging to be integrated with other learning and reflective mechanisms to bolster developmental outcomes. The findings of this study also indicate a need for program curriculum to be infused with content and skill development relating to reflective thinking practices. It is recommended for fellows to engage in reflective blogging with an emphasis on making meaningful connections between their current work and newly acquired international experiences, applications, and knowledge.

Program curriculum for VALOR and other adult programs with international components should be tailored to incorporate discourse (Jones & Bjelland, 2004), frameworks (Roberts, Conner, & Jones, 2013), and mechanisms to better prepare fellows for international thinking and learning both within agriculture and leadership settings. It is recommended for fellows to engage in pre-reflection, guided group and individual reflection during the experience, and post-reflection to increase capacity development during the international seminar. Pre-reflection provides a space for thoughtful consideration of expectations associated within the learning experience and bridges thinking about the experience and learning from the experience (Jones & Bjelland, 2004). Guided reflections could aid novice fellows in processing of the experience (Roberts et al., 2013). Because learners have different levels of knowledge and learning styles, Roberts et al. (2013) proposes opportunities for both individual reflection and collaborative debriefing as a best practice during international experiences within any adult program. Post-reflection should also be implemented to provide a space for fellows to connect goals and expectations set within the pre-reflection following the culmination of the experience.

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# **Help! Determining the FFA and SAE Professional Development Needs of Louisiana Agriculture Teachers by Years of Teaching Experience**

## **Introduction**

While education is always changing for every type of educator, for an agriculture teacher the change can be much more drastic. With rapidly changing standards and expectations, professional development workshops for educators are imperative. Departments of agricultural education have had the purpose of identifying and delivering important in-service workshops to agriculture teachers (Barrick, Ludewig, & Hedges, 1983). However, workshop designers often have had difficulties in identifying the most relevant topics (Birkenholz & Harbstreit, 1987; Washburn, et al., 2001). Specifically, FFA and SAE professional development needs vary from teacher to teacher based on years of teaching experience. Research has indicated that early career teachers often desire professional development over implementing SAE programs and advising FFA members (Layfield & Dobbins, 2002). However, experienced teachers have reported desire for professional development in (a) preparing FFA degree applications, (b) Career Development Event (CDE) training, (c) preparing proficiency award applications, (d) utilizing computers/multimedia, and (e) teaching record keeping skills (Layfield & Dobbins, 2002).

## **Theoretical and Conceptual Framework**

The Theory of Andragogy served as the theoretical framework underpinning this study. The core premise of andragogy is that adult learners have different needs, wants, and desires for learning experiences than do young students (Knowles, 1980; Knowles, Holton III, & Swanson, 2015). Per the model, teachers' professional development needs may differ depending on career stage. The literature review revealed that scholars in agricultural education have assessed the professional development needs of agriculture teachers for many years. Research commonalities have been noted, but professional development needs can vary by state, years of experience, and career stage (Birkenholz & Harbstreit, 1987; Fessler & Christensen, 1992; Layfield & Dobbins, 2002; Roberts & Dyer, 2004; Washburn et al. 2006). Additionally, a comprehensive study of the FFA and SAE related professional development needs of Louisiana agriculture teachers has not occurred in the past 20 years. The principle research that arose from the review of literature was: how do the FFA and SAE professional development needs of Louisiana agriculture teachers vary by years of teaching experience?

## **Methods**

The target population of this study was all Louisiana agricultural educators actively working during the 2017–2018 academic year (N = 261). Data were collected, with a paper instrument delivered by the researcher at each of the three Louisiana FFA Leadership Camp sessions in July 2017. In all, 190 advisors registered for camp and 164 finished the survey, which yielded 86.0% response rate, representing 62.8% of the total agriculture teacher population in Louisiana. No attempt to collect data from those who did not attend a camp session was attempted because an accurate frame (i.e., directory) of agriculture teachers was not available at the time of data collection. The instrument consisted of six sections, (a) instruction/curriculum, (b) technical agriculture, (c) Career/Leadership Development Events, (d) SAE, (e) program management, and (f) teacher characteristics. For the purpose of this study, only Career/Leadership Development Events, SAE, and Program Management are reported. Data

were analyzed utilizing SPSS version 24.

### Results

Table 1 highlights the perceived FFA and SAE needs of Louisiana agriculture teachers. Agriculture teachers with 1 – 5 years of experience reported *Career Development Events* ( $M = 2.44$ ), and *Leadership Development Events* ( $M = 2.41$ ) were in need of some professional development. Teachers with 6 – 25 years of experience reported some professional development needs in *Leadership Development Events*, and *Program Management*. Finally, teachers with 26+ years of experience responded with some need in *Career Development Events* ( $M = 1.96$ ), and *Program Management* ( $M = 1.98$ ).

Table 1  
*Perceived FFA and SAE Needs of Louisiana Agriculture Teachers*

Item	Years of Experience											
	1–5		6–10		11–15		16–20		21–25		26 or more	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Career Development Events	2.44	0.92	2.40	0.89	2.03	0.88	1.77	0.94	2.16	0.90	1.96	0.71
Leadership Development Events	2.41	0.97	2.42	0.90	2.16	1.01	1.85	0.86	2.21	1.11	1.90	0.86
Program Management Supervised Agriculture Experience	2.37	0.90	2.70	0.96	2.24	1.14	1.87	0.87	2.19	1.02	1.98	0.84
	2.03	0.84	2.33	0.70	2.02	0.84	1.45	0.92	2.08	0.79	1.49	0.83

*Note.* Note. Real limits: No Need = 0 – 0.49; Little Need = 0.50 – 1.49; Some Need = 1.50 – 2.49; Much Need = 2.50 – 3.49; Highest Need = 3.50 – 4.00

### Conclusions/Implications/Recommendations

The purpose of this study was to identify FFA and SAE professional development needs of Louisiana agriculture teachers by years of experience. Table 3 sought to identify FFA and SAE related professional development needs of Louisiana agriculture teachers by years of experience. All items were reported in need of some or much professional development by all categories of teachers. Previous research concluded that experienced teachers needed professional development in performing FFA related activities, such as degree applications and award applications (Garton & Chung, 1996; Layfield & Dobbins, 2002; Joerger, 2002; Peiter, Terry & Cartmell, 2003; Duncan et al., 2006). However, previous research has indicated that novice teachers need the greatest professional development needs in SAE related activities (Layfield & Dobbs, 2002). Based on this research the authors recommend that this information be shared with state agricultural education staff, Louisiana Agriculture Teachers' Association, and anyone else who offers professional development for agriculture teachers. It is also recommended that professional development workshops be tailored to specific years of teaching experience. One size fits all professional development workshops may not be the most effective way to deliver quality professional development to all career stages.

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**Improving Post-Secondary Teaching: Teaching the Future Professor Pedagogy**

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## **Introduction & Program Description**

There is a general assumption in higher-education that research-focused instructors are not as good in the classroom as teaching focused faculty. Figlio & Shapiro (2015) found that faculty with both focuses are recognized as being inconsistent. Hoffmann and Oreopolus (2009) indicated that a correlation exists between students' expectation of effectiveness in teaching from their faculty and their success in the class. Research Priority 5 of the American Association of Agricultural Educations' Research Agenda speaks to the need for the development of a continuous human capital pipeline from secondary through post-secondary to improve agriculture education at all levels (Thoron, Myers, & Barrick, 2016). Preparing effective future faculty in the agricultural sciences is important in the effort to train future agricultural scientists, not only in the direct implementation of this program, but also in the training of future students in their classes (Committee on a Leadership Summit to Effect Change in Teaching and Learning, 2009).

Institutions, students and parents are expecting an increase in teaching ability in higher-education (Austin, 2003). No longer, does research expertise mean that you will be a successful faculty member (Austin 2003). An emphasis on both teaching strategy, as well as research, defines the academic job market. Faculty members experience tensions between research and teaching expectations that has characterized professorship at institutions of higher education (Austin, 2002; Lewindowsky & Purdy, 2001). Yet, doctoral preparation continues to remain heavily focused on research preparation, with little emphasis on pedagogical practice (Price & Cotton, 2006). This need to prepare future faculty in the College of Agriculture and Life Sciences lead to the development of this program.

The educational effectiveness and outcomes of the program were evaluated. GTS is a three-year cohort program that aims to develop pedagogical skills in selected PhD students in the College of Agriculture and Life Sciences at Virginia Tech. Scholars in the first year observe their mentor teaching, in the second year they co-teach or TA, and in the third year take on the responsibility as Instructor of Record. The Scholars also maintain their own research responsibilities in their academic departments while also attending a weekly class session on pedagogy, enroll in the Universities three-class Pre-Professoriate Certificate, and complete an educational research project.

## **Theoretical Framework**

The Virginia Tech Graduate Teaching Scholars (GTS) program was designed around an experiential learning model. This experiential approach is also supported by strong relationships. This combination of experience, expertise and relationships in educational practice is supported by a Communities of Practice (CoP) framework. CoPs are the reification of the theories of social structure, theories of practice, theories of identity and theories of situated experience in the context of social theory of learning (Wenger, 1998). In practice, CoPs are groups of individuals with differing levels of expertise engaging with each other to improve their skills in varying levels of formality. Members of CoPs are people who share a common interest around learning that organize, whether, organically or formally, to fulfill both individual and group goals (Wenger, 1998). Thus CoPs foster best practices over an extended period of time and exist within the real-world that participants live. CoP's are differentiated from a team because of the

ongoing interaction of the participants over a period of time, investigating the same interest.

### **Methods**

Focus-groups and individual interviews were conducted with current program participants, the Scholars ( $n=5$ ), program alumni ( $n=5$ ), faculty mentors ( $n=4^*$ ), and administrators ( $n=5^*$ ) over a three-week period in the Fall semester of 2016. The asterisk denotes that an interviewee had been both a faculty mentor and serves as a Department Head. The total number of study participants was 18. Experience by the program participants ranged from having completed the first year in the program as a current participant to having graduated the program and working in their current position for almost a year. Audio recordings were transcribed verbatim. Transcripts were line-by-line open coded. Codes, analytical memos and field notes were then used to develop themes.

### **Results**

Five main themes emerged. Theme 1. Participants Perceptions and Experiences of the Components of the Program has five sub-themes: Three-year program, weekly sessions, experience of teaching, research component, and mentors. In Theme 2. Recruitment & Finding Successful Scholars it was recognized that matching participants interest in teaching and career goals with the program objective was important. Additionally, there was an acknowledgement that it was an important motivation for participation that the program providing half of the Assistantship. Theme 3. Development of Community of Practice describes the relationships fostered among cohort members, between participants and faculty mentors, and, those among many additional individuals through the research component. Many relationships even continued even after the program was completed. Theme 4. Preparation for a Career in Academia describes the tension that program participants experienced between research and teaching requirements, the mental emphasis that teaching took when instructing, and the responsibility that comes with being the instructor of record. Theme 5. Areas for Improvement describes the need for consistent and formalized feedback, and the mentor role and responsibilities needed to be clarified for the faculty mentor and the participants, additionally the participants expressed a desire for a balance of theoretical and practical teaching application in the weekly class discussion.

### **Implications & Recommendations**

The GTS program is an intense program for individuals who want to become excellent higher-education teachers. Because of the intensity, this type of program is not right for every PhD student. It is an excellent preparation for those who do want to have a heavy teaching appointment or have an innate desire to be an excellent teacher. The development of positive and long-term relationships within the cohort, and among the many individuals involved in the program was important for enhanced learning and development of efficacy. The three-year cohort was found to be a unique program model that allowed for participants to grow into their ability. Additionally, it was recognized that being a Teaching Assistant was not enough preparation to become an effective lead instructor as a graduate student, nor as a professor. Serving as an instructor and feeling the responsibility of the students needs and classroom management was important for developing teaching efficacy in conjunction with mentoring and the support from the group. A recommendation from the findings are that the faculty mentoring relationship was important for the Scholar. In order to maximize this affect, the role, responsibility and support for the mentor needs to be clearly defined to make it effective.

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**Mississippi State University Extension Personnel Communication Needs Assessment**

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## **Mississippi State University Extension Personnel Communication Needs Assessment Introduction**

Extension personnel's responsibilities include promoting programs and knowledge to their clientele. Changes in clientele communication methods, such as increased cell phone ownership (Smith, 2017) and a preference for faster information (Rodewald, 2001), require Extension personnel to be versatile and adapt to a variety of communication mediums. While the majority of Extension personnel are using smart phones and social media personally (Hopkins, 2013), step-by-step media training and social media guidelines are still needed to apply these technologies in Extension (O'Neill, 2011) because Extension personnel likely "do not have the skills or inclination to work in online environments" (Diem, 2011, p. 6). Because analyses of Extension personnel's communication skills and needs have focused on individual states outside of Mississippi or have not compared newer communication platforms, such as social media, to more traditional communication methods (Erichsen, 2008; Jernigan, 2015; McClure, 2014; O'Neill, 2011; Telg, 2007), more research is needed to compare newer and traditional communications methods in different states. This study fits within Research Priority Area 2: New Technologies, Practices, and Products Adoption Decisions in the AAEA Research Agenda (Roberts, Harder, & Brashears, 2016).

### **Theoretical Framework**

The Innovation-Decision Process (Rogers, 2003) consists of five stages: knowledge, persuasion, decision, implementation, and confirmation. In the knowledge stage, individuals are aware the innovation exists, while in the persuasion stage they develop an attitude, either favorable or unfavorable, toward the innovation. The knowledge stage is more cognitive, while the persuasion stage is more affective. In the decision stage, individuals take actions that lead to their choice of whether or not to adopt the innovation. In the implementation stage, an individual makes use of the innovation, and in the confirmation stage, individuals do more research about whether adopting the innovation was the right decision. As individuals are going through this process, there are factors that can improve adoption rates. This includes observability, which is the ability to see others trying an innovation first. As it applies to this study, if Extension wants more personnel to engage in a specific communications activity, the early adopters' comfort or discomfort with an activity can affect future adoption rates.

### **Methods**

A questionnaire was developed for this survey of Mississippi Extension personnel, including county agents, area agents, associates, regional specialists, and state specialists/faculty. The questionnaire was distributed online to 356 personnel and 129 responded (36.2%). This study addressed which communications activities Extension personnel engaged in and their comfort with each activity they engaged in. Personnel did not report comfort with activities if they did not engage in those activities. The project, not reported here, also included perceived importance of communications activities and professional development preferences. The instrument was reviewed by personnel in the Office of Agricultural Communications to ensure it would meet the needs of the organization and address the variety of communications activities personnel engage in.

### **Results**

The highest percentage of Extension personnel have given speeches (92.4%), taken photos (90.9%), edited writing for grammar and clarity (82.6%), marketed Extension (81.8%), and written an educational newsletter (81.8%). The fewest personnel created Snapchat posts (17.4%), created Instagram posts (16.7%), engaged in other social media (13.6%), wrote for a

blog (12.9%), or managed a blog (6.8%). If survey respondents had performed a communication activity, they ranked their comfort from 1 = *Uncomfortable* and 5 = *Comfortable*. Personnel were most comfortable writing a handout for class ( $M = 4.78$ ), managing a Pinterest account ( $M = 4.71$ ), writing an educational newsletter ( $M = 4.63$ ), making a speech ( $M = 4.60$ ), taking photos ( $M = 4.57$ ), and writing a promotional newsletter ( $M = 4.57$ ). They were least comfortable with creating webpages ( $M = 3.61$ ), doing graphic design for promotional handouts ( $M = 3.95$ ), creating Snapchat posts ( $M = 4.00$ ), writing an editorial column ( $M = 4.03$ ), and editing video ( $M = 4.07$ ).

### **Conclusions & Recommendations**

Mississippi Extension personnel were more likely to use written communication, such as press releases and newsletters, than Florida agents (Telg, 2007) but similar use of written communication compared to Oklahoma Extension personnel (Erichsen, 2004). Mississippi Extension personnel's use of social media platforms is similar to findings that the most common social media platforms used by Arizona Extension personnel (Hopkins, 2013) and family economics agents nationwide (O'Neill, 2011) are Facebook, YouTube, and Twitter, respectively.

Facebook had both the highest use and comfort level of social media platforms, possibly because, amongst social media platforms, Facebook is the most similar to the written communication mediums that agents reported high comfort in, such as newsletters. Although blogging is also heavily based in writing, Mississippi personnel's low use is similar to past research (Cater, 2013; Hopkins, 2013), with the most common reasons Extension personnel list for low blog use being "I don't have time," (58.3%) and "I don't know how to make blog posts easily accessible for me to read" (15.5%) (Cater, 2013). Although comfort was low for social media platforms such as Snapchat and Instagram, comfort was unexpectedly high for Pinterest. Agents who adopt Pinterest seem to become comfortable easily. Future research should consider whether this high comfort level can be attributed to use of Pinterest for Extension communications or whether personnel adapt skills learned from personal Pinterest use for their jobs.

There are many factors that could influence Extension personnel's communication outside of comfort level. Extension personnel's perceptions of clientele's access to internet (Alston, 2011), clientele's preference for information sources (Steede, 2012), clientele's familiarity with Cooperative Extension programming (Telg, 2007), and Extension personnel's own demographics (Harder, 2007) affect Extension personnel's communication choices. Future research should evaluate how these factors cumulatively influence Extension personnel's communication decisions and which factors are most influential. Additionally, change over time of comfort level as Extension personnel try new communication mediums should be measured. Research should be done on beyond state level to build continuity in the literature because many studies consider only one state when evaluating Extension personnel communication.

Given the low costs of using online and social media, increased use of those activities is important in a time when Extension budgets facing cuts in many states. Professional development is needed to train Extension personnel for online and social media to increase use rates and comfort with the technologies. Past research (Cater, 2013) indicates Extension personnel prefer webinar professional training over other types of online skill development, though these results only include one state. More research is needed on the professional development preferences of Extension personnel.

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### Outcomes of a state-wide service learning and leadership experience for agriculture students

#### Introduction

Agricultural and natural resource leadership programs are created to diversify young leaders and develop leadership skills by exposing them to study and experiences (Carter & Rudd, 2000), formal and informal training (Bolton, 1991), properly designed programs (Earnest, 1996) and cultivate community participation (Rossing & Heasey, 1987). Service learning programs help students understand community needs (Billig, 2000) and develop skills in leadership and needs assessment (Kelsey & Wall, 2003). In meeting those challenges [State Organization] created the [Program], a state-wide service-learning leadership development program in partnership with [State FFA Foundation] and [Company]. Selected high school students participate in a week-long intensive training, complete a year-long community service project under the supervision of a mentor, and present their project to stakeholders, state and community leaders, and partners at an annual review.

This study examines the effectiveness and outcomes of [program], a need articulated in the AAAE national research agenda (Roberts, Harder, & Brashears, 2016) priority areas four (meaningful and engaged learning in all environments) and five (vibrant, resilient communities).

#### Purpose

The purpose of this study is to investigate impact of a year-long, service-learning program on high school FFA members. We used Ash & Clayton's (2009) role of reflection as a conceptual framework and were guided by the following research question.

RQ1: What are the outcomes and vital components of the [Program]?

#### Methods

This qualitative study used purposeful sampling (Patton, 2002) of participants of the 2013-2015 cohorts of the [Program]. We used semi-structured interviews to collect data. The protocol was reviewed for validity by a panel of experts (including 3 non-university leadership educators). We followed Patton's (2002) six types of questions to create questions that elicit deep responses useful for qualitative inquiry. Data saturation (Merriam 2009) was reached at 10 interviews. Interviews were transcribed by one researcher. Data was analyzed by open-coding methods in iterative fashion (Wahyuni, 2012). Researchers read transcripts initially for overall understanding and discrete codes were assigned (N=276). In second order analysis, researchers used constant comparative analysis to build emergent themes, which were then refined, combined and collapsed as appropriate in third order analysis. Researchers maintained credibility and trustworthiness through frequent peer debrief, transcripts, audit trail, research journals, and triangulation (Lincoln & Guba, 1985).

#### Findings

46 discrete codes were excluded, as they were not related to the research question, leaving 229 codes to be analyzed. Ten themes emerged, with three themes containing significant sub-themes. Theme and sub-theme structure and frequency is noted in table 1. Participants described teamwork in terms of enhanced ability to sense others need and meet team outcomes. Leadership was characterized as a synergism of specific curricula outcomes in addition to traditional

leadership definitions. Long-term reflection was characterized by comments that indicated students continued to think about the effects of [program] for years after completion. The community awareness theme showed that service learning gave participants a deeper understanding of institutions and cultures in their own community, and helped foster open communication channels.

*Table 1. Emergent themes and descriptive statistics.*

Themes and sub-themes	Frequency	%
Overall impact	13	5.68
Organizational skills		
<i>Strategy</i>	8	3.49
<i>Time Management</i>	5	2.18
<i>Planning</i>	5	2.18
Soft Skill Growth		
<i>Leadership</i>	25	10.92
<i>Identifying strengths &amp; weaknesses</i>	7	3.06
<i>Teamwork</i>	31	13.54
<i>Self-discovery</i>	12	5.24
<i>Adaptability</i>	16	6.99
Mutual awareness		
<i>Gaining Community Awareness</i>	24	10.48
<i>Increasing agricultural awareness in community</i>	7	3.06
Service and servant leadership	19	8.3
Long-term reflection	24	10.48
Continued engagement	12	5.24
Real-life application	7	3.06
Gratitude	6	2.62
Connecting with stakeholders	8	3.49

### Conclusions and implications

We concluded that [program] impacts include: organizational skills, soft skills, mutual awareness, and servant leadership. [Program] complements many youth development programs that focus on leadership and soft-skill development. Impacts were still “clicking” with participants even after several years and other formative experiences, evidence that the vital components—long-term reflection, continued engagement, and service servant leadership—should be reinforced in this and other programs.

Ultimately, participants consistently and without exception characterized [program] as effective in their overall development. Concepts like teamwork, community awareness, and leadership could have manifested from the state-wide and exclusive nature of the program, the rigor, or other programmatic features. Future research should explore these links. Future research should also seek causal relationships associated with other features, including length of program, service learning curricula, and rigor.

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**Perceived Factors that Influence the Success of Vertical Transfer Students in Agricultural Education**

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## **Perceived Factors that Influence the Success of Vertical Transfer Students in Agricultural Education**

### **Introduction**

The number of students attending community colleges in 2015 accounted for approximately 41 percent of all undergraduate students (American Association of Community Colleges, 2017). Students who began at a two-year college were 21 percent less likely than students who began at the senior institution to obtain a bachelor's degree (Monaghan & Attewell, 2015) and only 25 percent of community college students later transferred to a 4-year institution (Jenkins & Fink, 2015). The specific factors that influence transfer students in Agricultural Education should be investigated. A discipline-based analysis of data found that transfer success was varied across disciplines. There is a need to evaluate the academic performance of community college transfer students by academic discipline (Cejda, 1997). Special attention should be given to community college students during the transfer to Agricultural Education programs at their respective senior institutions.

### **Conceptual Framework**

Transition Theory and Validation Theory served as the framework for this study. Transition Theory proposes how students adapt as they transfer from the community college to a four-year institution (Schlossberg, 1981) and Validation Theory identifies students who are validated in their college experiences and are more likely to persist (Rendón, 1994). The potential interaction of these theories created the conceptual model for validation within the transition phase. The process of moving from a community college to a four-year university is recognizable as a time of transition for students. While students will respond differently based on the characteristics of the transition, the environment, or the individual, validating experiences during this time are capable of supporting student adaptation to the new situation.

### **Methods**

Two research questions supported this investigation: 1) *identify the perceived factors that influence the bachelor's degree attainment of vertical transfer students in Agricultural Education* and 2) *analyze the trends which impact students' completion of a bachelor's degree in Agricultural Education*. This research study addressed the Research Priority 5, "What can agricultural leadership, education, and communication practitioners (teachers, extension agents, etc.) collaborate to deliver educational programs effectively?" (Thoron, Myers, & Barrick, 2016). An electronic mail invitation was sent to each participant with a link to the survey. Each panelist was asked to indicate their level of agreement using a five-point Likert-scale. For inclusion in the study potential participants had been employed in Agricultural Education at a post-secondary institution for at least five years, five peer reviewed articles, and involvement in a professional organization. Participants were between 29 and 58 years old, 5 and 30 years of experience in Agricultural Education at the postsecondary level, and membership in a related professional organization.

## Results

Analysis of the data was completed using SPSS.22. Of the 26 questions, participants scored 12 items with a mean score  $\geq 4.5$ . 1) *being prepared for class increases Bachelor's degree attainment*, 2) *classroom engagement promotes completion of a Bachelor's degree*, 3) *ability to make social adjustments at a four-year university is important to Bachelor's degree attainment*, 4) *meaningful relationships with faculty members are important to student attainment of a Bachelor's degree*, 5) *financial aid guidance increases Bachelor's degree attainment*, 6) *access to reliable transportation improves Bachelor's degree attainment*, 7) *real-life applications in the classroom encourages attainment of a Bachelor's degree*, 8) *prompt faculty feedback improves Bachelor's degree completion*, 9) *easy access to student support services (advising, counseling, financial aid, tutoring, etc.) encourages completion of a Bachelor's degree*, 10) *satisfaction in the overall college experience promotes Bachelor's degree attainment*, 11) *feeling of personal academic competence encourages Bachelor's degree completion*, 12) *awarding of transfer credits encourages Bachelor's degree attainment*.

## Conclusions

The conclusions of this study indicated the importance of relationships where students have access to information, financial needs, and application of their coursework. The interaction between faculty and students is demonstrated as a component of matriculation between two and four-year institutions where support is seamless and available during the transitional period. The need for in-class validation was supported by panelists and preparation for classroom engagement were identified as the most significant in the attainment of a Bachelor's degree. The panel also demonstrated support for "out-of-class" validation factors: ability to make social adjustments, financial aid guidance, access to reliable transportation, access to student support services, and awarding of transfer credits.

## Implications

The research panel supported the theory that students need in-class and out-of-class validation in order to successfully transition to a four-year institution and complete a Bachelor's degree. As two and four year universities develop programs for student success a holistic approach for student success should be considered from all avenues. Faculty and staff should engage collaboratively with advisement, recruitment, and transfer services. Agriculture education students would benefit from developing professional relationships with faculty prior to transferring to a four-year institution. The degree in which students are overwhelmed with new requirements for certification, student teaching, and navigating a new campus system may encourage improved completion rates for certified teachers. Further investigation is needed to identify the factors that increase in-class validation experiences for transfer students, and determine how to provide out-of-class validation experiences for transfer students.

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**Promoting Innovation and Team Performance Through Cognitive Diversity: A case of  
Extension Agents in Morogoro-Tanzania**

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## **Introduction**

Agriculture is a significant driver of growth, poverty reduction and food security, not to mention an important source of raw materials in Tanzania. Extension agents as change agents deliberately try to bring about change or innovation in their communities to solve various agricultural problems. According to Arif Shah et al, (2013), the extension agents remain one of the prime movers in the development of the agriculture sector. When working in communities, extension agents collaborate and engage with other stakeholders to solve various agricultural problems in order to increase food security and improve the community livelihoods. However, according to Jablow (2005), “Different types of problems require different types of solution and different approaches and resources and needs to reach those solutions”. Thus extension agents have to be able to apply different solutions depending on the nature of the problem to be solved.

## **Theoretical Framework**

This study utilized (KAI) Kirton Adaption- Innovation Theory (2011). According to Kirton’s proposed continuum of cognitive style, the range between more adaptive and more innovative individual positions represent an individual approach to problem-solving, creativity and decision making. Adaptors prefer to work in the guidelines as a structure; while innovators prefer to work within the structure they create. “The key to the adaptive-innovative distinction is the way people prefer to manage cognitive structure. The more adaptive prefer their problems to be associated with more structure, with more of this structure consensually agreed; the more innovative prefer solving problems with looser structure and are less concerned that the structure they use is consensually agreed” KAI (2011) (pg.47). It is, however, apparent that our cognitive ability is what dictates our problem-solving style. Understanding such styles is critical in the world of today than ever before as they surely help in maintaining healthy relationships in every corner of our lives and thus make us stay productive. This is because we live and operate in the world that is full of complexities. Awareness of individual style brings about substantial performance improvement. According to Stum (2009) “people differ in their approach to problem-solving, Some are more comfortable as change agents in certain scenarios depending on what they deem as acceptable change”. The economic environment is uncertain, the climatic conditions become adverse, cultural aspects contribute in performance, team dynamics carries significant attention while leaders are still deploying management techniques of a manual worker age, just to mention a few. All individuals are creative and problem solvers and each person is a change agent, but they differ in their styles of solving problems (Kirton, 2011).

## **Methodology**

A three day workshop explaining KAI theory was followed by a qualitative research study. Both workshop and research were conducted in the Morogoro Region. Seventeen Extension agents (n=17) were selected from Morogoro Region for this study. The sample was selected to achieve multiple perspectives on preferred style in problem-solving and creativity, management of cognitive gap and cognitive diversity when working in teams, as well as understanding the new concept of KAI. Data were collected through face-to-face interviews, which were audio recorded and transcribed verbatim. KAI inventory was used to measure

participants' styles in problem solving. The study was conducted in Kiswahili and was translated by the researcher into English for data analysis. The consent form was verbally explained in Kiswahili. The interviews were transcribed and open-coded to generate themes, which was supported by quotations.

### **Results**

Working in groups require individual and group effort to accomplish the stated goal. Cognitive diversity is important in solving problems especially when working in teams. Understanding individual differences reduces team conflicts and increases team performance and cohesion. The study shows that many extension agents face challenges when dealing with teams in communities or the working places. The group interviewed showed the characteristics of more adaptive individuals, however, some individuals seem to prefer working within less structure but the working environment had a major impact on their current style. Many showed that they adopted coping behavior when working with teams but also in their family and working places. They get used to the situation for the sake of reducing conflicts despite the fact that it is not their preference. Participants appreciated the impact of KAI in understanding their preferred style when solving a problems. KAI can be one of the important instruments that can be expedient in different institutions to reduce conflict, increase performance, collaboration and cohesion.

### **Conclusion**

People behave differently in their unique ways when exposed to a given situation. One's personality includes, but not limited to, attitudes, modes of thought, feelings and actions, self-awareness, self-regulation, self-consciousness responses to opportunity and stress and interaction to others. Cognitive diversity is inevitable when working in teams, subsequently, there is a need for extension agents in Tanzania to learn more about their differences in styles when solving problems. Teams need to push each other in critical and creative thinking which includes accepting and acknowledging vulnerability, asking challenging questions and taking personal and group risks. Understanding self and others may increase effectiveness, efficiency, and collaboration among extension agents and other actors.

### **Implications and Recommendations**

More Adaptive and more innovative individuals view their paradigms and core concepts differently (Jablokow, 2005). Understanding the difference in problem solving style is very important in our day to day lives. In group tasks, it is essential to bring both more adaptive and more innovative individuals to the table and work together to accomplish the stated goal. According to KAI (2011) the individual cognitive style is innate, it does not change. Technique can be learned to improve the skills in problem solving but the style is the same. Team differences in problem-solving style are useful in managing teams, promoting team interactions and putting emphasis on team collective problem-solving. The knowledge of KAI is critical in creating self-awareness that would make workplaces great places to be. From the analysis and conclusion, cognitive diversity influences innovative ideas, creativity, promote cohesion and collaboration and increases interaction between team members.

Without understanding the differences in cognitive styles, often times people adopt a coping behavior. Some of the participants shared their experiences on the act of coping in

working places or in their families. A coping behavior can be consciously or unconsciously applied depending on the situation, and sometimes there is a purpose in coping. In some cases coping is advantageous but if it is prolonged it can create problems. Most people learn skills and techniques when coping so as to improve performance and to stay away from the problems, however people use too much energy when coping.

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## **Seeking and Engaging: Case Study Integration to Enhance Critical Thinking Style**

### **Introduction**

As the global population nears the projected 9.8 billion people by 2050 (United Nations, 2017), the agricultural and natural resources (ANR) sectors continue to battle many complex, and often controversial, issues that confront the industry. Climate change, water, food security, food safety and bioenergy are among the top ANR issues in the United States (United States Department of Agriculture – National Institute of Food and Agriculture, n.d.). In order to combat these issues, undergraduate students must be prepared to think critically. Critical thinking is considered to be one of the most important cognitive traits and has been linked to an individual's success (Lamm et al., 2011). Case studies have been shown to enhance critical thinking (Popil, 2011) because of the real-world experience a case study brings to the learning environment (Naumes & Naumes, 2012).

### **Conceptual Framework**

Critical thinking is one of “the most important intellectual skills for the 21<sup>st</sup> century” (Halpern, 2002, p. 3). Critical thinking is considered a higher-order of thinking (Burden & Byrd, 1994) and, while there are critical thinking skills identified in the literature, critical thinking styles have also been studied and identified (Lamm & Irani, 2011). “The cognitive style of critical thinking explains how an individual prefers one particular method to another when processing information, or critically thinking about a particular topic” (Gorham, Lamm, & Rumble, 2014, p. 44). Lamm and Irani (2011) have identified two cognitive styles of critical thinking that exist on a continuum: a tendency toward seeking information and engagement. Those who recognize their own experiences, biases, predispositions and environment are more likely to seek information. Seekers are “hungry learners” who listen to others opinions, are always looking for new knowledge, and desire to know the truth, even if it conflicts with their current beliefs (Lamm & Irani, 2011, p. 7). Those who prefer engagement when thinking critically are confident in their abilities to communicate and look for opportunities to reason with others, showing their ability to problem solve and arrive at a decision (Lamm & Irani, 2011). While neither style is considered better or worse than the other, the ultimate critical thinker will be able to work within both styles when thinking through an issue critically (Lamm & Irani, 2011). Previous research has shown case studies are effective in promoting critical thinking (Popil, 2011) but research lacks in how critical thinking can be enhanced with case studies dealing with ANR issues. The purpose of this research was to assess if case studies enhanced the way undergraduate students think critically when enrolled in communication courses that taught about ANR issues.

### **Methods**

A pre-/posttest, experimental research design was used to determine if case study integration influenced undergraduate students' critical thinking style. The population was undergraduates enrolled in communication courses that taught about ANR issues at three universities. The sample was obtained through purposive sampling with 83 students in these courses. The first set of data, the control, was collected during the spring 2016 semester when the courses were taught without case studies integrated. The treatment data were collected in the same courses a year later during the spring 2017 semester with the integration of five case studies. The pretest and posttest were identical. The pretest was given the first week of class, and

the posttest was given the last day of class. Students had a week to complete the posttest. Five case studies were developed to provide students with real-world experience with the following ANR issues: animal health, food safety, marketing and trade, conservation, biotechnology, invasive species, food security, water, and climate change. The University of Florida Critical Thinking Inventory (UFCTI; Lamm & Irani, 2011), an established, reliable instrument, was used to determine students' critical thinking style on the pre/posttest. There were 26 respondents in the control group and 57 in the treatment group. Data were analyzed in SPSS 24. Descriptive statistics were used to identify the mean differences and a *MANOVA* was used to determine the influence of the integration of the case studies on students' critical thinking styles.

### Results

The results indicated the integration of the case studies had a significant positive effect on students' critical thinking style (Table 1). After taking a course with the case studies, students were more willing to seek out information and engage with others when thinking critically. In the control group, willingness to seek information and engage with others decreased (-1.23; -0.78). However, when the case studies were implemented, the mean difference from pretest to posttest increased for both willingness to seek information and engagement with others, with engagement having the largest change (+1.54). The *F* statistic indicated students were more willing to critically think with the large difference between mean differences from control to treatment. In addition, when the treatment and control mean differences were compared, there was a statistically significant change in both seeking information and engagement (Table 1).

Table 1

#### *Differences in Critical Thinking Style*

	Control			Treatment			<i>F</i>
	Pre <i>M(SD)</i>	Post <i>M(SD)</i>	$\Delta M$	Pre <i>M(SD)</i>	Post <i>M(SD)</i>	$\Delta M$	
Seeking							
Information	52.12(4.38)	50.89(6.84)	-1.23	53.74(4.98)	54.70(5.75)	+0.96	15.03**
Engagement	51.54(4.65)	50.76(5.79)	-0.78	52.90(5.48)	54.44(5.94)	+1.54	20.06**

*Note.*  $R^2 = 0.363$ ; \*\* $p < .01$

### Conclusions, Implications and Recommendations

The results indicated the integration of case studies encouraged students to seek out information and engage with others more than a course without case studies. Previous research supports these findings that case studies improve critical thinking (Popil, 2011). These findings imply real-world experiences, such as those presented in the case studies (Naumes & Naumes, 2012), increase critical thinking. All students in this study were more willing to engage with others with the exposure of real-world experiences of the issues (Naumes & Naumes, 2012). Case studies should be integrated into classrooms that teach about ANR issues so students have a real-world environment to experience the issues and critically think about issues. Future research should examine if case studies increase critical thinking style in classes outside of communication courses, such as content-specific bench science courses in respective colleges of agriculture. Additional research should focus on critical thinking of other ANR issues not addressed in this study.

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**Student Preparedness: College Ready or Career Ready?**

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## **Introduction**

College and Career readiness has been the focus of several major educational initiatives. Within this focus, a question has emerged as to whether or not the skills required for college readiness are similar to those required for career readiness (Finn & Petrilli, 2010; Trilling & Fadel, 2009). The Common Core State Standards (CCSS) have included a college and career readiness component to help teachers align their instruction with college and workforce expectations. Many stakeholders believe students exiting high school are not being fully prepared for the demands of college or a career (Stone & Lewis, 2012). Are the skills needed to succeed in a college setting different from those needed for a career setting? Aligning with priority three of the National Research Agenda of the American Association for Agricultural Education (Stripling & Ricketts, 2016), this research sought to explore the college versus career ready question through teacher's open-ended responses by determining the variables that make college and career readiness similar or different from one another.

## **Theoretical/Conceptual Framework**

The guiding theory and framework for this research included Bandura's Social Cognitive Theory (SCT) (Bandura, 1986) and Bronfenbrenner's Bioecological Theory of Human Development (BBTHD) (Bronfenbrenner, 2005). Jointly SCT and BBTHD were connected to create the Conceptual Model for the Study of Student Readiness in the 21<sup>st</sup> Century providing a systems approach to prepare students to be both college and career ready (DiBenedetto & Myers, 2016). Within the model students develop learning, career and life skills that allow them to become life ready individuals prepared to be responsible citizens in their homes, schools and communities.

## **Methodology**

A non-experimental, descriptive survey research design was utilized for this study to collect data from 191 teachers in Florida. Data collection followed Dillman's tailored design method (Dillman, Smyth, & Christian, 2009). As part of a larger quantitative study, focused on teacher perceptions of college versus career readiness, the research question posed to teachers in Florida was, 'Do you think the knowledge, skills, and dispositions required of a student to be career ready differ from the skills required to be college ready?' If yes, 'Please explain why you think the knowledge, skills, and dispositions required of a student to be career ready differ from those skills required to be college ready.' Qualitative data analysis was conducted using the constant comparative method (Lincoln & Guba, 1985). In the first stage, each member of the research team separately analyzed ten of the total qualitative responses (n = 95). Codes were individually established, the research team met and minor adjustments were agreed upon to establish interrater reliability to compare and contrast the remaining open-ended responses.

## **Results/ Findings**

Findings revealed four overarching themes: skill sets, academics, environment, and expectations. The college ready skill sets theme revealed study skills with a testing and core academic performance focus existed. Academics, uncovered a broader, analytical, and abstract approach existed. A focus on preparing for the future appeared in college readiness skills, whereas career



## Research

readiness focused on the here and now. Career ready skills focused less on academic skills and more on interpersonal and intrapersonal skills. Employability and technical skills were revealed as key competencies needed for career readiness in a “learn as you go” environment. Within career readiness, a sense of professionalism was expected more so than in college readiness. Academic expectations differed between college and career readiness, as college readiness focused on higher academic levels, emphasizing core concepts, study skills, and being analytical. Career readiness academic expectations surfaced as technical skills, specific training, learning through hands-on/applied activities, and flexibility of thought.

The college environment was described to be more structured and forgiving. Students use college as a time to mature and figure things out, with more flexibility to explore various career options. Students are not completely independent from their parental support and are primarily focused on entering college and receiving high test scores, with little innovative thought. The career ready environment offers less formative assessment opportunities, has less room for error and expects the individual to initiate and complete projects with self-direction while being a contributing member of society. College ready requires a higher academic standard with little to no remediation, meeting teacher’s standards, whereas career ready expects professionalism, being interactive with others, and producing an accurate and quality end product.

## Conclusions

Teachers in Florida believe there are differences between the knowledge, skills, and dispositions required of students to be college versus career ready. College ready skill sets focus more on academic skills whereas, career ready skill sets focus more on professional and people skills. College ready academics are more focused on scholastic ability and study skills whereas career ready academics are focused on hands on job training. The college ready environment is more independent, structured, and forgiving, whereas the career ready environment is less structured and teamwork oriented. College ready expectations are more focused on academic preparedness and meeting teacher expectations whereas career readiness expectations encourage employees to be professional, responsible, and show initiative. The research question primarily focused on self-perception, therefore respondents’ perceived competencies and their past experiences in high school, college, and career may have had an effect on their responses. This research supports the notion that the environment surrounding students affects how they view themselves, their academic success, and how they interact with various experiences on a variety of levels. The student’s environment in a college or career setting influences requisite knowledge, skills, and dispositions that are impacted by their education and experience as depicted in the Conceptual Model for the Study of Student Readiness in the 21<sup>st</sup> Century (DiBenedetto & Myers, 2016).

## Impact on Profession

Understanding the differences in skill sets, academics, environment, and expectations between college and career readiness can assist parents, educators, and advisors in becoming more aware of how students destined to pursue college or a career will need to be mentored. Likewise, students making the decision to enter college or a career can be informed of the two paths by letting them picture where they best see themselves fitting to meet their overall goals. Educators need to become more aware that not all students will go to college, but all students will one day embark upon a career and thus, need to be prepared for whichever path they choose.

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**Students' perceptions of workforce readiness compared to industry expectations**

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## Students' perceptions of workforce readiness compared to industry expectations

### Introduction

The United States is currently experiencing a skills gap between the abilities of employees and the expectations of employers (Casner-Lotto, Barrington, and Wright, 2006). Research has indicated that not only are many graduates not adequately equipped with the skills that they need to succeed in the workplace (Robinson & Garton, 2008), they often overestimate the extent of the capabilities that they do possess (Jaschik, 2015). *The Prepared U Project* (Bentley University, 2014) identified postsecondary institutions as important centers of workforce development where career training and guidance can begin. However, Hodge and Lear (2011) noted that many students do not recognize the value of the skills that they are taught, and many professors are unaware of the ever-shifting and evolving needs of the working world.

### Conceptual Framework

In order to understand how colleges can better prepare students for their future careers, their current perceptions towards workforce readiness skills must be measured and compared to the actual expectations of the working world. This issue has been examined in other career fields (Hickey, 2009; Hodge & Lear, 2011; Kavanagh & Drennan, 2008; Landrum, Hettich, & Wilner, 2010), but few studies have looked at what is necessary to succeed in the modern agriculture industry. Goerker, Smith, Fernandez, Ali, and Goetz (2015) expect agricultural fields to experience job growth through 2020, and estimate that approximately 58,000 positions requiring bachelor's degrees or higher will open every year.

If American agriculture is expected to feed and clothe a growing world, it is essential that these positions be filled by quality candidates who can capably display vital skills on day one of their employment. The importance of this need is stated in research priority three of the American Association for Agricultural Education's National Research Agenda (Robert, T. G., Harder, A., & Brashears, M.T., 2016). This study intends to compare college agriculture students' perceptions of career skills against the needs of actual employers in the agricultural industry.

### Methodology

Participants ( $N = 59$ ) in the study were asked to complete a questionnaire originally used by Landrum, Hettich, and Wilner (2010) to examine workforce readiness perceptions of psychology graduates. The survey was reviewed and edited for relevance to the agriculture industry. IRB approval was obtained before data collection, and all students signed a consent form. Participants were given time to complete the instrument during class. The researchers collected all questionnaires and data were analyzed using descriptive statistics including means and standard deviations. Participants were presented with a list of 54 job skills that included competencies such as "present information verbally to others", "handle conflict maturely", and "work to achieve organizational goals". From this list, they were asked to rank the 10 skills they viewed as most important to workplace success, with 1 = most important and 10 = least important.

In order to identify the work skills sought by agricultural employers, researchers analyzed 43 entry-level announcements for careers in the agricultural industry. Skills were grouped by themes such as "communication," "flexibility and adaptability," and "time management and

organization.” These themes were compared to the skills identified by the students who responded to the questionnaire.

### Results

Students who responded to the questionnaire ( $N = 59$ ) were members of two undergraduate agriculture classes at Mississippi State University, and ranged in age from 20 to 50 years old ( $M = 22.10$ ,  $SD = 3.89$ ), with 42 men (71.2%), 16 women (27.1%), and one undisclosed. The majority of respondents were white (93.2%), completing an agriculture degree (94%), and preparing to enter an agriculture related-career upon graduation (84%). Results allowed for the creation of two top 10 lists of job skills. The first list used item frequency to assign placings, and the second took student ratings into account as a means for breaking ties. In order from most important to least important, the top 10 overall skills were: “work well with others,” “adapt to change,” “work independently,” “teach and learn from others on the job,” “manage several tasks at once,” “possess a positive attitude towards work,” “handle conflict maturely,” “demonstrate highly developed social skills,” “function effectively in stressful situations,” and “possess self-discipline, including punctual attendance and reliability.”

The analysis of agriculture-related job announcements revealed skills involving communication are highly sought after, with verbal communication appearing in 27 announcements (62%) and written communication in 18 (41%). Other desired skills included time management and organization ( $n = 14$ , 32%), flexibility and adaptability ( $n = 10$ , 23%), working independently and/or without supervision ( $n = 8$ , 18%), problem and conflict management ( $n = 7$ , 16%), learning on the job ( $n = 4$ , 9%), and personal integrity and responsibility ( $n = 3$ , 6%).

### Conclusions and Recommendations

While participants do have a basic understanding of what skills are needed in the workplace, there are many areas in which their views do not match current employers'. This can be seen especially when comparing students' ideas of necessary skills with employers' demands. For example, both top 10 lists indicate that participants placed value on being productive, reliable workers who were capable of solving problems and building positive relationships with others. While some employers did seek these skills, they were more desirous of applicants that showed aptitude in speaking, writing, and presenting.

It is of particular interest to note the disparity in beliefs regarding communications skills, as they were the most demanded skill from employers but were viewed as less important by participants. Only one communication competency – “demonstrate highly developed social skills” – even made the final top 10 list, and it placed quite low. Two other related skills – “receive and use both positive and negative feedback,” and “present information verbally to others,” – made the first top 10 list, but did not see high enough frequencies or rankings to be included on the final list. No written communications skills made either top 10 list, which indicates that participants likely do not understand their necessity or ubiquity in the working world.

It is recommended that college personnel stress the importance and usage of behavioral skills in career situations – most importantly those related to written and oral communications – and guide students in developing them throughout their college career. Further research should be performed to identify how workforce skills required by employers vary by industry or location.

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**Teacher Perception of the Georgia Middle School Agricultural Education Curriculum and  
its Relationship to Secondary Agricultural Education Enrollment.**

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# **Teacher Perception of the Georgia Middle School Agricultural Education Curriculum and its Relationship to Secondary Agricultural Education Enrollment.**

## **Introduction/Need for Research**

Middle school agricultural education programs are some of the earliest forms of formal education in agriculture that a student can receive in the United States. Agricultural Education in middle school provides students with exposure to the agriculture industry and helps them to understand the requirements of careers within the field (Frick, 1993). Middle school programs have been identified as significant influences upon the overall growth, development, and stabilization of enrollment in secondary agricultural education programs. These programs serve a vital role in the recruitment and retention process and ultimately contribute to the overall success of agricultural education (Cupp & Weaver, 1994). Herren and Denham (1990) found that effective middle school agricultural education programs are essential in the recruitment of students within secondary agricultural education programs. This study assists in the solution to AAAE research priority number four which is meaningful, engaged learning in all environments (Edgar, Retallick, & Jones, 2016). More specifically, this study focuses on the solution to the research priority question, “How can delivery of educational programs in agriculture continually evolve to meet the needs and interests of students?” (Edgar, Retallick, & Jones, 2016, p. 39).

## **Theoretical Framework**

Kolb’s (1984) experiential learning theory served as the theoretical framework of this study. Experiential learning is a critical component of successful agricultural education programs because it engages students in the learning process and promotes critical thinking and problem-based learning (Wozencroft, Pate, Griffiths, 2014). The conceptual model for the study identifies the three components of middle school agricultural education and demonstrates the interconnected nature and subsequent relationship to secondary enrollment. The components presented in this model are consistent with the most predominant model of agricultural education, which includes the interrelationships between classroom and laboratory instruction, supervised agricultural experience, and FFA (Phipps & Osborne, 1988). The conceptual model for this study demonstrates the potential of the three components of middle school agricultural education and how they can ultimately shape a student’s perception of agricultural education, which contributes to secondary enrollment decisions.

## **Methodology**

The purpose of this study was to describe middle school agricultural education teacher perception of the curriculum and its relationship to enrollment in secondary agricultural education programs. The research objective that guided this study was to describe middle school agricultural education teacher’s perceptions on how classroom/laboratory experiences, FFA experiences, and SAE experiences are related to a student’s decision to enroll in a high school agricultural education course. The population for the study was all middle school agricultural education teachers in Georgia. A simple random sample of the population was calculated using Cochran’s (1977) sample size formula for continuous data and minimum return sample size. This descriptive and correlational study used a quantitative non-experimental survey research design to collect data from the teachers included in the sample. The questionnaire was designed to collect data on teacher’s perceptions of the effects of middle school experiences on student’s decisions to enroll in a high school agricultural education course. The questionnaire was presented via a five-point Likert-type survey and based upon the experiences a middle school



agricultural education student may have in each of the three components of the agricultural education program model. Faculty and graduate students at Auburn University served as a panel of experts to ensure content and face validity of the instrument. No changes were made to the instrument as a result of this review. Cronbach's alpha was calculated to determine the reliability of experiences in agricultural education ( $\alpha=0.92, 0.89, \& 0.95$ ) scales for classroom/laboratory, FFA, and SAE experiences respectively as it pertained to the influence on secondary enrollment.

### **Findings**

Teachers perceived "Hands-on learning" ( $M=4.82, SD=0.45$ ) to have the greatest influence upon a student's secondary enrollment decision and "Learning about the history of American agriculture" ( $M=3.60, SD=0.88$ ) as the lowest influence as it pertains to classroom and laboratory experiences. Teachers perceived "Being an FFA member" ( $M=4.90, SD=0.30$ ) to have the greatest influence upon a student's secondary enrollment decision and "Participating in FFA fundraising efforts" ( $M=4.07, SD=0.81$ ) as the lowest influence as it pertains to FFA experiences. Teachers perceived "Raising/exhibiting livestock" ( $M=4.68, SD=0.60$ ) to have the greatest influence upon a student's secondary enrollment decision and "Learning record keeping skills through SAE program" ( $M=3.86, SD=0.95$ ) as the lowest influence as it pertains to SAE experiences. FFA experiences represented four out of the top five most influential experiences, which also included the most influential experience "Being an FFA member" ( $M=4.90, SD=0.30$ ).

### **Conclusions**

All three components of agricultural education were represented in the top ten most influential experiences on secondary enrollment with four from classroom/laboratory, four from FFA, and two from SAE. Previous research on middle school experiences related to secondary enrollment as perceived by students revealed different findings. Students indicated that classroom and laboratory experiences had the greatest influence on secondary enrollment with the top ten most influential experiences having six from classroom and laboratory experiences, three from SAE experiences, and only one from FFA experiences. While students may have varying levels of involvement in the FFA, every student has unique educational experiences in the classroom on a day-to-day basis. Students have reported these experiences as the greatest influence upon their decision for continued enrollment. This indicates a discrepancy between what teachers believe have the greatest influence upon secondary enrollment and what actually influences students (Chapman, Barrick, & Thoron, 2016).

### **Implications/Recommendations**

The agricultural education program model should serve as the guiding model for the instructional/curriculum design process in agricultural education courses. Agricultural educators tend to place greater value and emphasis on one of the three components. Agricultural educators need to fully understand the value and importance of classroom/laboratory instruction and not over emphasize one component of the agricultural education program model over another. Professional development strategies need to be in place to ensure that teachers understand the value of the agricultural education program model and feel comfortable and confident in providing quality experiences for students in all areas. Agricultural educators tend to place a heavier emphasis on FFA experiences, however students have indicated that their experiences in classroom and laboratory instruction have the greatest influence upon their secondary enrollment decisions. Therefore, classroom and laboratory instruction has a major impact on a student's overall experience in agricultural education, which could be a key factor as it pertains to matriculation.

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**Teaching Enhancement through Agricultural Laboratories Workshop: Effects on Self-Efficacy and Intent to Teach Agricultural Sciences**

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## Introduction

Many secondary students incorrectly perceive agriculture as being a production-oriented, labor-intensive industry, offering few opportunities for science, technology, engineering, and math (STEM) careers (National Research Council, 2009; STEM Food and Ag. Council, 2014). Thus, students interested in STEM often do not consider agriculture as a viable career option (Smith, Rayfield, & McKim, 2015). Infusing STEM instruction into school-based agricultural education (SBAE) programs is both a national priority (Stripling & Ricketts, 2016) and an effective method of countering misperceptions by teaching students about cutting-edge science applications and related career opportunities in the agricultural sciences (Stubbs & Myers, 2015). However, the very nature of rapidly occurring advances in the agricultural sciences, coupled with an aging teacher workforce, limits agriculture teachers' direct experience with and knowledge of modern agricultural sciences (Boone & Boone, 2007). Educators cannot teach what they do not know.

In the context of curricula, the theory of planned behavior (Ajzen, 1991) posits teachers' decisions about whether to teach particular topics (in this case, agricultural sciences and associated careers) are dependent on their attitudes toward the topics, their perceived control over teaching the topics, and their subjective norms regarding these topics. Researchers (Johnson & Wardlow, 2017; Paulsen, Han, Humke, & Olde, 2014) have found teacher workshops are effective in enhancing self-efficacy in teaching STEM topics, making teachers more likely to incorporate these topics into the curriculum. The purpose of this study was to determine the effects of a two-week, immersive workshop on teachers' self-efficacy and intent to teach agricultural sciences and agricultural science careers.

## Methods

The population for this study included Arkansas and Missouri agriculture and science teachers ( $N = 12$ ) participating in a two-week inservice workshop in summer 2017. Participants spent approximately 70% of their time in university agricultural science labs learning from and working with faculty researchers on cutting-edge science related to avian immunology, animal health, biosecurity, reproductive physiology, and genetics. Teachers spent the remainder of their time working with university teacher educators to design related lessons and laboratory activities appropriate for use in high school agriculture classes. On the final day of the workshop, teacher teams presented their lessons and activities to other participants and project staff for constructive criticism and feedback. At the conclusion of the workshop, teachers completed two instruments (based on the Science Teaching Efficacy Beliefs Instrument [Enochs & Riggs, 1989]) measuring their perceptions of and intent to teach about agricultural sciences and agricultural science careers. Each instrument contained 10 Likert-type items with a retrospective pretest (Gouldthorpe and Israel, 2013) and a traditional post-test. Nine summated items measured pre- and post-workshop self-efficacy toward teaching agricultural sciences (or agricultural science careers) and one stand-alone item measured teachers' intent to teach agricultural sciences (or agricultural science careers) in the next school year. Summated scale reliabilities ranged from .74 to .80. Eleven participants (92%) completed the evaluation instruments; one participant left early due to a family emergency. Data were analyzed using descriptive statistics; Cohen's  $d$  (Cohen, 1988) was used to describe the magnitude of changes in self-efficacy or intent to teach agricultural sciences and agricultural science careers.

## Results

Workshop participants developed increased levels of self-efficacy toward teaching both agricultural sciences and agricultural science careers because of workshop participation (Table 1). Mean scores for self-efficacy in teaching agricultural sciences moved from essentially neutral on the four-point scale to positive, while self-efficacy in teaching agricultural science careers moved from neutral to somewhat positive. The Cohen's  $d$  for each indicated a large effect (Cohen 1988) for workshop participation on teacher self-efficacy.

Table 1. *Effects of Workshop Participation on Teachers' Self-Efficacy in Teaching Agricultural Sciences and Agricultural Science Careers*

Attitude toward teaching:	Pretest		Posttest		Cohen's $d$
	$M$	$SD$	$M$	$SD$	
Agricultural sciences	2.58	0.36	3.02	0.34	2.31
Agricultural science careers	2.52	0.38	2.85	0.41	1.67

*Note.* Based on a four-point (1 = strongly disagree and 4 = strongly agree) Likert-type scale.

Participants expressed a somewhat increased intent to teach both agricultural sciences and agricultural science careers because of the workshop (Table 2). However, the pretest means indicated teachers strongly agreed they would teach both topics prior to completing the workshop; workshop participation only slightly increased their level of agreement. The Cohen's  $d$  for each indicated a small to medium effect (Cohen, 1988) for workshop participation.

Table 2. *Effects of Workshop Participation on Teachers' Intent to Teach Agricultural Sciences and Agricultural Science Careers*

Intent to teach:	Pretest		Posttest		Cohen's $d$
	$M$	$SD$	$M$	$SD$	
Agricultural sciences	3.55	0.52	3.80	0.42	0.47
Agricultural science careers	3.70	0.48	3.80	0.42	0.32

*Note.* Based on a four-point (1 = strongly disagree and 4 = strongly agree) Likert-type scale.

## Conclusions

The two-week intensive workshop was effective in enhancing participants' self-efficacy and intent to teach both agricultural sciences and agricultural science careers. This is consistent with the theory of planned behavior (Ajzen, 1991) in that experiences designed to enhance teachers' attitudes, perceived control, and subjective norms toward new curricular topics increase self-efficacy, which in turn, increases the likelihood of incorporating new topics into the curriculum. These findings are consistent those of Johnson & Wardlow (2017) and Paulsen et al. (2014).

## Implications/Recommendations/Impact on the Profession

In addition to increased self-efficacy and intent to teach agricultural sciences and agricultural science careers, this workshop also provided participants with both instructional materials and a professional network to assist in STEM integration. Workshops such as this provide agricultural educators with an effective and proven model for stimulating curricular change in SBAE programs. Future research will follow-up with participants to determine the extent to which they have incorporated agricultural science and agricultural science career topics into their local programs.

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## University Faculty Perspective on Student Entitlement

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## University Faculty Perspective on Student Entitlement

### Introduction and Theoretical Framework

Grades and letters of recommendation are accepted as the core of college student evaluations (Rosovsky & Hartley, 2002). However in recent years, faculty are experiencing increased behaviors of academic entitlement (AE) that impact grades. The behaviors may include students lobbying for higher grades, expectations of special accommodations, asking for concessions that relate to their needs, requesting class notes, or asking for grades they have not earned. Many students become distressed if a grade less than an A is the expected outcome. Students' sense of entitlement is reinforced by professors providing high marks for minimal to average effort by the student. Inflated grading reinforces the view that favorable academic outcomes are given rather than earned (Twenge & Campbell 2009). Benton (2006) felt that the culture of self-indulgence is due in part to the consumer mentality of students and the failure of professors to maintain expectations. This demand creates tension for faculty who know that student evaluations influence promotion, so accommodations are made for customer satisfaction (Benton, 2006).

Academic entitlement is "the tendency to possess an expectation of academic success without taking personal responsibility for achieving that success" (Chowning & Campbell, 2009, p. 982). Greenberger et al. (2008) defined academic entitlement as the "expectation of high rewards for modest effort, expectations of special consideration and accommodation by teachers when it comes to grades, and impatience and anger when their expectations and perceived needs are not met" (p. 1194). Twenge (2014) calls this narcissistic entitlement where feeling good about yourself is more important than good performance.

### Methods

The population of study was a stratified random sample of university faculty at the University of Arkansas. Participants (544 tenured, 294 tenure-track, and 560 non-tenure) were stratified, based on the number of faculty representing each college or school and rank, resulting in a selected sample size of 500. Sample size was calculated by total population ( $N = 1,398$ ) with a confidence interval of 95% with an acceptable margin of error equaling 5% resulting in a sample size needed of 302 participants. Researchers chose to increase the participant list based on the use of an electronic instrumentation system (Qualtrics). University IRB approval was gained (#16-02-540) and the University of Arkansas Office of Institutional Research stratified and provided the needed electronic list. The instrument was a modified version of a reliable and valid entitlement instrument (Greenberger et al., 2008) where slightly modified phrasing was used for adaptation in this study. Questions about personal and academic entitlement ( $N = 22$ ) were used. Responses were indicated on a Likert-type scale that ranged from 1 (strongly disagree) to 6 (strongly agree). Demographic data were correspondingly gathered through the instrument.

### Results

Crosstabs were used to analyze participant responses. When gender was utilized to categorize responses, no significant differences were found, except when viewing responses to the statement *If students have completed most of the reading for my class, they deserve a B in the course*. Males ( $n = 81$ ) more strongly disagreed than females ( $n = 68$ ) with this statement and the overall mean was 1.89 ( $SD = .85$ ) with a mode of 2. When asked about their position to the



statement *I tend to provide students with higher grades than they have earned because I worry about my annual performance evaluation being influenced by student evaluations*, faculty at the assistant professor level responded in agreement as opposed to other faculty ranks. Instructors, Associate Professors, and Professors most often disagreed with this statement. When asked their position on the statement *I feel poorly when I don't respond the same day to an e-mail a student sent*, Instructors ( $M = 3.49$ ,  $SD = 1.53$ ) and Professors ( $M = 3.43$ ,  $SD = 1.43$ .) most often agreed whereas Assistant ( $M = 3.11$ ,  $SD = 1.39$ ) and Associate Professors ( $M = 3.13$ ,  $SD = 1.39$ .) were divided between agree and disagree.

### **Conclusions**

Entitlement is a topic of much discussion in today's educational settings. The differences between age groups (student and faculty) towards their values and beliefs should be investigated to determine best practices in educational settings. It is apparent through analysis of the participants (overall) that gender does not play a role towards entitlement views of faculty at any level (i.e. instructor to professor). It was interesting to note that males tended to disagree more than females toward student grades based on information intake required of a course. We must understand that each participant might view the requirement differently based on their course needs but overall faculty did indicate that just by accomplishing an assignment does not indicate their deserving of an acceptable grade (B).

Additionally, when analyzing participants (based on rank), assistant professors were concerned about student evaluation and therefore grade inflation was viewed as an acceptable alternative. It is easy to determine that this rank of faculty more easily viewed this as acceptable because of their tenuous stance in the academic profession. Furthermore, it was noted that Professors most often agreed to "feeling poorly" when not responding quickly to student emails. It is assumed that instructors who are strongly tied to students through extensive teaching loads would agree to this statement but the emergence as professors who also felt this was intriguing.

### **Implications/Recommendations**

The immediate question based on the findings of this study is how to alleviate the idea to non-tenured faculty that grade inflation based on perceived student perceptions is not optimal for student learning or a founded view of attainment of course goals based on actual performance. How should the academic field gather perceptions about teaching yet reduce the mitigating factor of how student evaluations will be shown? Do we adopt the secondary school practice of having outside evaluators assess faculty teaching performance?

Further study of this topic is imperative. It should be realized that the largest segment (nationwide) is part-time faculty members (AAUP, 2017). A further investigation into their perceptions should be undertaken. We recommend that this research continue to explore public (land and non-land grant) and private university systems. Understanding the views of academic professionals will shed light on the diversity of student and faculty views of entitlement and education and may allow a more holistic view on student and faculty responsibilities of learning.

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## Use and Perceptions of *Varroa* Control Practices Among Florida Backyard Beekeepers

### Introduction

Each year beekeepers in the United States lose around 40% of the honey bee colonies that they manage (Seitz et al., 2016). The cause of these high losses is multifaceted and may include nutritional issues (Staveley, Law, Fairbrother, & Menzie, 2014), environmental stressors (Dennis & Kemp, 2016), and honey bee pests (Staveley, Law, Fairbrother, & Menzie, 2014). The honey bee parasite *Varroa destructor*, commonly known as *Varroa*, is the leading pest of European honey bee colonies (Anderson & Trueman, 2000) and is considered by most honey bee researchers as the greatest contributing factor to colony losses (Rosenkranz, Aumeier, & Ziegelmann, 2010; Dietemann et al., 2012).

While annual surveys of beekeepers by the Bee Informed Partnership (Seitz et al., 2016) nationally track which pest control methods are being used by beekeepers, there has been little other research on U.S. beekeepers and the management decisions they make. This study, therefore, sought to explore the decision-making processes of Florida backyard beekeepers when it comes to *Varroa* control in their honey bee colonies. The specific objectives of this study were to determine 1) the perceived importance of *Varroa* control to beekeepers, 2) the motivating factors contributing to the use of one *Varroa* control method over another, and 3) the barriers to adoption of *Varroa* control methods by backyard beekeepers in Florida.

### Theoretical Framework

This study considered the *Varroa* control decisions made by Florida backyard beekeepers using the framework of perceived behavioral control as asserted in Icek Ajzen's theory of planned behavior (TPB). In the TPB, a person's behavioral intention is directed by three sorts of reflections: beliefs about the probable penalties of the behavior (behavioral beliefs), beliefs regarding the standard expectations of others (normative beliefs), and beliefs pertaining to the existence of elements that could assist or hinder enactment of the behavior (control beliefs) (Ajzen, 2001). A certain population is more apt to assume a certain behavior when they have a favorable outlook toward it, believe that other people will support it, and suppose they will be effective in displaying it (Lee & Kotler, 2015). With this theory as a framework, beekeepers were surveyed and interviewed regarding their perceptions of *Varroa* control methods and the factors that promote or impede beekeeper use of these management strategies.

### Methodology

This study employed a mixed methods explanatory sequential design consisting of two phases. Phase one (quantitative) included a researcher-developed questionnaire that was administered via an online survey. Data from this phase was analyzed and the results were used to develop interview questions for phase two (qualitative).

The target population for this study were backyard beekeepers (having 40 colonies or less) who were registered with the Florida Department of Agriculture and Consumer Services (FDACS), Bureau of Plant and Apiary Inspection in July, 2017. All backyard beekeepers on the FDACS registration list with registered email addresses (2,930 individuals) were sent a link to complete the online survey. The researcher-developed questionnaire was made up of three parts: 1) beekeeping practices that participants used surrounding *Varroa*; 2) attitudes towards, and perceived control over *Varroa* control in participants' colonies; and 3) demographic information. This questionnaire met Institutional Review Board standards (IRB 201701447).

Phase two of this study entailed semi-structured phone interviews with participants from the quantitative phase. Quantitative results obtained in phase one influenced the interview questions in phase two. The variable of interest considered in developing phase two was beekeeper perceptions of *Varroa* control methods. All interviews were transcribed for accuracy and coded.

### Findings

The quantitative results (124 responses) indicated that most participants utilized natural or organic *Varroa* control methods, perceived use of effective *Varroa* control methods as extremely important, had overall positive perceptions about actively controlling and monitoring for *Varroa*, and agreed that those important to them would approve of the methods that they used. These results influenced the qualitative phase, which sought to explain the quantitative data.

Interview transcripts were thematically coded and four overarching themes emerged. From the five interviews, most interview participants 1) indicated that they rely on credible or expert sources when considering new or different management techniques, 2) spoke about *Varroa* as a critical issue for beekeepers, 3) indicated that product effectiveness was a top priority when choosing particular *Varroa* control methods, and 4) related their preference for organic chemicals over synthetics to the perception that synthetic chemicals are more harmful to bees.

### Conclusions

The beekeepers in this study consider many factors when making decisions about *Varroa* control in their honey bee colonies. These individuals tend to consult credible information sources including local and regional beekeeping experts before making management decisions and are generally concerned about treatment efficacy when considering *Varroa* control options. The reported barriers to adoption of certain *Varroa* controls included a perceived lack of effective chemical products and the perceived harmfulness of chemicals to bees.

Phase one survey results indicated that a majority of the surveyed beekeepers prefer to use organic products when controlling for *Varroa*; however, phase two interviews revealed that many of the beekeepers had substantial misconceptions about the term “organic” as it related to *Varroa* control products. This is a noteworthy finding in that preference of one method over another could be influenced by the perceived notion that chemical methods are not safe for bees or the environment. Ambiguity and misconceptions about *Varroa* control products could be a potentially significant barrier to their adoption.

### Implications

Since *Varroa*-ridden bees affect not just an individual colony, but rather whole bee yards and neighboring apiaries, controlling *Varroa* must be a community and industry-wide effort. It is, therefore, a significant finding that most surveyed beekeepers see *Varroa* control as an important component of their beekeeping operations. Continued efforts to understand the choices that beekeepers make concerning pest control in their colonies will inform the development of effective *Varroa* control training programs for backyard beekeepers in the future. Based on the conclusions of this study, these programs could help make clear the differences between various control methods including organic and synthetic chemicals. Clarity of terminology may also assist beekeepers in making more informed decisions. Additionally, this study suggests the importance of the perception of informational resources as being reliable. Organizations that want to enact behavior change among backyard beekeepers, will, as one would expect, need to present themselves as a trustworthy source of information.

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## Where's the Expert? Understanding the Expertise Gap in Preservice Agricultural Education Teachers

### Introduction

Many preservice agricultural education teachers voice a commitment to experiential learning practices (Baker, Robinson, & Kolb, 2012), but the profession is unsure whether their choice of pedagogical practice supports this stance. It has long been asserted agricultural education aligns with Experiential Learning Theory (Roberts & Ball, 2009). A previous study by Roberts, Baker, and Goosen (2016) found a lack of continuity between preservice teachers' articulated epistemological views and how those beliefs were operationalized. For this mixed methods study, the Educator Role Profile (ERP) self-assessment (Kolb, Kolb, Passarelli, & Sharma, 2014) was adapted as an observational instrument within a semi-structured interview to 1) determine the least common educator role preferred by preservice agricultural education teachers in an upper division teaching methods course at [state university], and 2) investigate preservice agricultural education teachers' lack of preference for the lowest ranked educator role. Addressing the American Association for Agricultural Education's National Research Agenda Priority Five: Efficient and Effective Agricultural Education Programs (Thoron, Myers, & Barrick, 2016), this study seeks to explain why an *expertise gap* exists among preservice teachers, with the subject expert role preferred least among the four educator roles.

### Conceptual/Theoretical Framework

The ERP self-assessment was developed to provide understanding for how educators approach the learning process and is rooted in experiential learning theory (Kolb, 1984; Kolb et al., 2014). The ERP assessment aids educators in matching learning styles and the concepts of experiential learning theory into a model for engaging learners in all modes of the learning cycle (Kolb et al., 2014). The ERP identifies the most common educator role teachers adopt, influenced by the educational activities preferred and their relation to the four learning cycle modes of experiential learning (Kolb et al., 2014). The four educator roles adopted are coach, facilitator, standard setter/evaluator, and subject expert (Kolb et al., 2014). Just as experiential learning theory posits learners engage in all four modes of the learning cycle (Kolb, 1984), the ERP proposes teachers develop the flexibility to use all educator roles (Kolb et al., 2014). Identifying an educator's most common role through the ERP brings about self-awareness for one's own preferred teaching role and identifies opportunities for additional educator role adoption to improve the learning environment for learners (Kolb et al., 2014).

### Methodology

A concurrent triangulation mixed methods approach was utilized for this study (Creswell, 2003), with the structured ERP self-assessment items comprising the quantitative strand and the non-structured probing interview questions comprising the qualitative strand. Semi-structured interviews facilitated the administration of an observational instrument containing the ERP self-assessment items, allowing for probing questions to better understand participant responses (Creswell, 2003). The population was a convenience sample (Privitera, 2017) of preservice agricultural education teachers enrolled in the agricultural education teaching methods course at [state university] during the fall 2017 term with intentions of completing their program student teaching requirements the following semester. Eleven interviews were recorded, transcribed, and analyzed to determine the preservice teachers' most common educator role and to identify key themes. Credibility, transferability, dependability, and confirmability principles were followed to

ensure rigorous and trustworthy results (Lincoln & Guba, 1985). The frequency distribution of preferred educator roles was calculated (Privitera, 2017). Qualitative data were analyzed using in vivo and pattern coding methods (Saldana, 2013). Researcher biases were identified and controlled through self-reflexivity, maintaining the integrity of data interpretation (Tracy, 2010).

### Findings

The distribution of preservice teachers' most common preferred educator roles were: 72.73% ( $n=8$ ) preferred the coach role, 9.09% ( $n=1$ ) preferred facilitator, and 18.18% ( $n=2$ ) preferred standard setter/evaluator. With zero preservice teachers preferring the expert role (0.00%), it was determined to be the least preferred educator role. This finding supports the conclusion of preservice teacher weakness in the subject expert role (Baker & Twenter, 2016).

After analysis of the interview transcription, the following themes regarding preservice teachers' conceptualization of the subject expert role emerged: *apprehensions*, *image of an expert*, *how learning occurs best*, *most valued knowledge type*, and *expectations of school-based agricultural educators*.

### Conclusions/Implications/Recommendations

A goal of agricultural teacher education programs is to prepare students with the knowledge of teaching and learning to be effective teachers in the secondary classroom (Barrick & Garton, 2010; Myers & Dyer, 2004). According to experiential learning theory and the ERP, this can be accomplished when educators develop the ability to adopt all four educator roles and engage learners in all modes of the learning process (Kolb, 1984; Kolb et al., 2014). Results imply suggest an expertise gap, indicated by preservice teachers' consistent ranking of subject expert as the least preferred role (Baker & Twenter, 2016).

Highlighted by the *apprehensions* theme, preservice teachers hesitate to adopt the subject expert role because they hold a belief that agricultural educators cannot know everything about their subject content, and as a result, have a fear they cannot be expected to know everything. As made evident by the *image of an expert* theme, preservice teachers believe a right or wrong answer does not exist to everything and find the subject expert role to represent unengaging lecture-based teaching methods unable to apply and put content into practice for learners. The preservice teachers hold a firm belief that *learning occurs best* hands-on, focusing on practice and application rather than the acquisition of key concepts and principles in agriculture. When discussing a preference for types of knowledge, the preservice teachers emphasize real world and practical skills as more *valued knowledge* than content-based knowledge in agriculture. Although four themes representing the data explain why preservice teachers do not prefer the subject expert role, the *expectations of school-based agricultural educators* theme provides insight into why preservice teachers view the role as needed, even when it is not their preference. The preservice teachers believe agricultural educators should know the content they are teaching and must be able to demonstrate their knowledge for students to increase interest in learning. However, preservice teachers believe they cannot fulfill this expectation, lacking confidence in their own agricultural content-knowledge capacity.

Understanding why the expertise gap exists for preservice teachers is paramount to agricultural teacher educator programs. Strategies should be developed and studied to increase preservice teachers efficacy in subject expertise, such as those techniques recommended by Baker and Twenter (2016), to improve their flexibility within the subject expert role.

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